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Ph.D.

A Neuroaesthetic Approach to the Study of Responses to Unfinished Works of Art of the Italian Renaissance

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I declare that the work presented in this thesis is my own.

ABSTRACT

Records of discussions about unfinished works of art, their morphologies, and the ways in which they are perceived date back to classical antiquity. However, the insights from these debates have never been fully explored in relation to the aesthetic responses of beholders to works of art. This dissertation seeks to address this gap by asking the following questions: What are the aesthetic implications of the unfinished? How do beholders respond to unfinished works of art? A fresh analysis of the artistic debate on the phenomenon of the unfinished from classical antiquity to the Italian Renaissance, combined with neuroscientific research, may help to answer these questions. This study focuses on the aesthetic responses of beholders to different types of incompleteness and the role imagination plays in visual perception. In order to provide an account of how beholders biologically respond in the contemplation of the unfinished, I will draw upon insights from aesthetics, philosophy of mind, and experimental psychology, exploring a series of mental faculties, theories, and concepts such as embodied simulation, empathy, imagination, imitation learning, mental imagery, neural filling-in, and prediction error minimisation. My hope is that this multipronged approach will both illuminate and present novel finding about (*i*) the implications of the unfinished in artmaking and perception; (*ii*) the role of the beholder's imagination in the aesthetic response; and (*iii*) the assumption that imitation learning is a human faculty that is exceptionally relevant when responding to the unfinished.

For my dearest grandparents Gianni and Melania

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INTRODUCTION

Aesthetic Responses to the Unfinished in Visual Culture

1 Object of Investigation: The Power of the Unfinished

The object of investigation in this thesis is the power of the unfinished, which is analysed by focusing on the aesthetic responses of beholders to unfinished visual works of art. Under scrutiny are two types of unfinishedness: (*i*) that suggested by a rough surface, that is, works of art that involve a surface in which signs of the tools used by the artist are highly visible; and (*ii*) that suggested by empty spaces, that is, works of art that represent figures characterised by a void instead of meaningful parts, such as contours, faces, and limbs. For reasons of consistency and clarity, this study restricts the field of inquiry to the Italian Renaissance—with occasional references to classical antiquity—and considers only the representation of human figures in sculpture, painting, drawing, and print.

By investigating the power of the unfinished in the visual arts, this work applies a neuroaesthetic approach to the study of beholders' biological reactions to incomplete figures. In this regard, the neuroscientific focus particularly concerns brain-body processes—including empathy, embodied simulation, imitation learning, imagination, neural filling-in, mental completion, and mental imagery—that might be activated in the contemplation of such figures.

Some of the motivations for investigating the aesthetic responses to images lie in the question "Why does an artwork look the way it does and have the impact it does?" I propose that it looks the way it does because it must arouse in the beholder a specific reaction: empathy or detachment, emotion or judgement, memory or/and imagination, and so on. Often, forms, colours, expressions, and gestures are not featured in the image by chance. They are there because the artist, or patron, intended to communicate particular messages or express certain emotions or ideologies. On other

occasions, there are forms that arouse certain reactions in the beholder independently from the artist's or patron's intentions. One of these is the case of involuntarily unfinished works of art. Even in these circumstances, it is worth reviewing the beholders' responses to shed new light on the concept of the power of images.

However, unfinished works of art are not the only images to present incompleteness. A large number of other works of art depict figures that, for one reason or another, are not entirely visible, or the actions they perform are not executed in full. This consideration leads us to mark the distinction between an incomplete figure and an incomplete vision. In this light, incompleteness emerges on various occasions in both two-dimensional and three-dimensional static works of art. However, an incomplete vision in art occurs most frequently in two-dimensional works, such as paintings, drawings, and prints, inasmuch as the beholder is able to see one side only of a depicted figure—the front, the profile, or, more rarely, the back— because we do not have the possibility to walk around it, as happens in sculpture.[1] There are also cases in which we cannot even see the whole side of a figure. This happens for instance when a figure is represented in the act of covering its face with its hands (fig. 1), in a gesture of desperation, or when parts of its body are hidden by other figures or objects—for instance, a figure behind a cross (fig. 2), which inevitably hides part of its body, or a figure depicted in the act of leaving the scene (fig. 3) and therefore only a portion of it is visible.[2]

The observation of a scene presenting this phenomenon of incompleteness, which often occurs in daily life, is referred to as amodal perception. Amodal perception often leads to amodal completion, which is the ability to see an entire object by a process of

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[1] For a philosophical explanation of the concept of incomplete vision in painting, see Rene Descartes, *Discourse on the Method of Rightly Conducting One's Reason and Seeking the Truth in the Sciences*, in id., *The Philosophical Writings of Descartes*, trans. by John Cottingham, Robert Stoothoff and Dugald Murdoch, 2 vols (Cambridge: Cambridge University Press, 2009), I, pp. 111-151 (132): "A painter cannot represent all the different sides of a solid body equally well on his flat canvas, and so he chooses one of the principal ones, sets it facing the light, and shades the others so as to make them stand out only when viewed from the perspective of the chosen side" (Part V, 42).

[2] In certain circumstances, artistic conventions may play an important role in art perception. As Ernst Gombrich pointed out, in the case of the bust, for instance, beholders do not perceive it as an amputated body, but as the institution of the bust. See Ernst Gombrich, *Art & Illusion: A Study in the Psychology of Pictorial Representation* (New York: Phaidon, 2014), p. 53.

neural filling-in of the parts that are covered by one or more objects.[3] It is in this sense that, most of the time, we must distinguish between what the object perceived *is* and how the same object *appears*.[4] In perceiving a man standing behind a one metre high wall, for instance, we know (or, better, predict) that he must have two legs, even though we do not see either of them. Since we do not generally perceive the object as it *is* but as it *appears*, it follows that the beholder's mind needs to construct the object in its own way, that is, combining the idea about what the thing *is* (with the help of

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[3] For more on amodal completion, see Xuyan Yun, Simon J. Hazenberg and Rob van Lier, "Temporal Properties of Amodal Completion: Influences of Knowledge", *Vision Research*, 145 (2018), pp. 21-30; Bence Nanay, "The Importance of Amodal Completion in Everyday Perception", *I-Perception*, 9 (2018), pp. 1-16; Siyi Chen, Hermann J. Müller and Markus Conci, "Amodal Completion in Visual Working Memory", *Journal of Experimental Psychology*, 42 (2016), pp. 1344-1353; Tatiana Aloi Emmanouil and Tony Ro, "Amodal Completion of Unconsciously Presented Objects", *Psychonomic Bulletin and Review*, 21 (2014), pp. 1188-1194; Hazenberg et al., "Differential Familiarity Effects in Amodal Completion: Support from Behavioral and Electrophysiological Measurements", *Journal of Experimental Psychology: Human Perception and Performance*, 40 (2014), pp. 669-684; James Dadam, "Amodal Completion of Boundaries in Coloured Surfaces", *Psychologia*, 55 (2012), pp. 227-254; Robert Eamon Briscoe, "Mental Imagery and the Varieties of Amodal Perception", *Pacific Philosophical Quarterly*, 92 (2011), pp. 153-173; Nanay, "Perception and Imagination: Amodal Perception as Mental Imagery", *Philosophical Studies*, 150 (2010), pp. 239-254; Sarah Weigelt, Wolf Singer and Lars Muckli, "Separate Cortical Stages in Amodal Completion Revealed by Functional Magnetic Resonance Adaptation", *BMC Neuroscience*, 8 (2007); Nanay, "Amodal Perception: Access or Visualization?", in *Proceedings of The Second European Cognitive Science Conference*, ed. by Stella Vosniadou, Daniel Kayser and Athanassios Protopapas (Mahwah, NJ: Lawrence Erlbaum, 2007), pp. 492-497; Gijs Plomp et al., "The 'Mosaic Stage' in Amodal Completion as Characterised by Magnetocephelography", *Journal of Cognitive Neuroscience*, 18 (2006), pp. 1394-1905; Plomp and Cees van Leeuwen, "Asymmetric Priming Effects in Visual Processing of Occlusion Patterns", *Perception & Psychophysics*, 68 (2006), pp. 946-958; and Hyunkyu Lee and Shaun P. Vecera, "Visual Cognition Influences Early Vision: The Role of Visual Short-Term Memory in Amodal Completion", *Psychological Science*, 16 (2005), pp. 763-768. For more on neural filling-in, see Zhicheng Lin and Sheng He, "Emergent Filling in Induced by Motion Integration Reveals a High-Level Mechanism in Filling in", *Psychological Science*, 23 (2012), pp. 1534-1541; Luiz Pessoa, Evan Thompson and Alva Noë, "Finding out about Filling-in: A Guide to Perceptual Completion for Visual Science and the Philosophy of Perception", *Behavioral and Brain Sciences*, 21 (1998), pp. 723-802; and Daniel C. Dennett, "Filling in Versus Finding out: A Ubiquitous Confusion in Cognitive Science", in *Cognition: Conceptual and Methodological Issues*, ed. by Herbert L. Pick, Paulus Willem van den Broek and David C. Knill (Washington, DC: American Psychological Association, 1992), pp. 33-49. Both amodal completion and neural filling-in are explored at length in § 6.3 of the present thesis.

[4] For more on the difference between what an object *is* and how it *appears* to the beholder, see Bertrand Russell, *The Problems of Philosophy* (London: Williams and Norgate, 1912), pp. 15-16: "We are all in the habit of judging as to the 'real' shapes of things, and we do this so unreflectingly that we come to think we actually see the real shapes. But, in fact, as we all have to learn if we try to draw, a given thing looks different in shape from every different point of view. If our table is 'really' rectangular, it will look, from almost all points of view, as if it had two acute angles and two obtuse angles. If opposite sides are parallel, they will look as if they converged to a point away from the spectator; if they are of equal length, they will look as if the nearer side were longer. All these things are not commonly noticed in looking at a table, because experience has taught us to construct the 'real' shape from the apparent shape, and the 'real' shape is what interests us as practical men. But the 'real' shape is not what we see; it is something inferred from what we see. And what we see is constantly changing in shape as we, move about the room; so that here again the senses seem not to give us the truth about the table itself, but only about the appearance of the table".

background memory, experience, and imagination) with the actual perception of its *appearance*.[5]

Additional types of incompleteness have been documented. For instance, damaged works of art should be considered examples of incompleteness (but not of unfinishedness). To this category belong artworks such as amputated statues (fig. 4), mural paintings damaged by weather (fig. 5), and fragments of works (fig. 6). A further case of incompleteness, which frequently appear in static works of art, is represented by figures depicted in the middle of an action. These actions should be considered incomplete because they belong to inanimate figures—such as carved or painted humans or animals—and therefore the movement that they are in the midst of performing is visible in only one of its fractions (fig. 7).

Though the present research focuses on the Italian Renaissance debate on the unfinished in visual works of art and the responses of beholders to Italian Renaissance artworks that have been left unfinished by their artists, either voluntarily or involuntarily, all the aforementioned cases of incompleteness will be taken into consideration. From the study of these phenomena, in which—in one way or another —parts of the figures or the actions they are performing are absent, two questions emerge: (*i*) how do beholders react when they perceive an image as incomplete (or unfinished) and (*ii*) to what extent, and in what way, does the incompleteness elicit new patterns of participation with images? The main task of this study is to propose a method to answer these two questions. This will help us clarify the role, if any, played by imagination during the observation of the incompleteness.

Seen in this light, the unfinished, I posit, reveals two levels of the psychology of art: (*i*) the psychology of the artist, inasmuch as the unfinishedness of his or her work demonstrates the method of the creative process that he or she undertook in creating the image, and (*ii*) the psychology of the viewer, emerging from the process of imagination (of either the creative process or the missing parts of the figures perceived—depending on the situation) and other mental processes that may be linked

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[5] For more on the role of imagination in perception, see Nanay, "Imagination and Perception", in *Routledge Handbook of Philosophy of Imagination*, ed. by Amy Kind (London: Routledge, 2016), pp. 124-134.

to this kind of perception, including embodied simulation, memory, imitation learning, and mental completion.

2   Method of Investigation: The Neuroaesthetic Perspective

In this research, the method of investigation plays a crucial role because it sheds new light on the phenomenon of the unfinished, that is, on the history of the debate on unfinished works of art and the way beholders have perceived them throughout history. A series of art historians and philosophers have investigated the phenomenology of art perception and aesthetic experience from different perspectives, and their ideas have been recently developed and deepened by neuroaesthetics. The works of some of these scholars are discussed in this section because their insights offer fruitful hints for my approach to the study of the unfinished in the visual arts.

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".[6] 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".[7] Put differently, he argues that "to enjoy aesthetically means to enjoy myself in a sensuous object diverse from myself, to empathise myself into it".[8] Therefore, according to Worringer, aesthetic experience consists of an empathic relationship between the subject and the contemplated object. Empathy, in 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 responses is critical.[9] In this sense, he stresses the importance of sensation in art contemplation.

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[6] Wilhelm Worringer, *Abstraction and Empathy: A Contribution to the Psychology of Style*, ed. by Harry Francis Mallgrave and Eleftherios Ikonomou (London: Routledge and Kegan Paul, 1953), p. 4.
[7] Ibid., p. 5.
[8] Ibid.
[9] Ibid.

Worringer also describes a type of aesthetic experience that results from the attentive perception (or apperception) formulated by Lipps[10]—that is, the perception of an object accompanied by the awareness of perceiving that same object:

> 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 me.[11]

In emphasising the role of sensation and perception in aesthetic experience, Worringer echoes the ancient Greek meaning of the word *aisthesis*.[12] What he adds in his definition is the assumption that aesthetic experience depends on both the aesthetic value of the object and "the urge to empathy", which is natural in the subject.[13] 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".[14] 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 it.[15]

What Worringer describes is a sort of extended body that projects itself "into the things of the outer world", enjoying itself in them.[16] Precisely here lies his definition of experience. In fact, in another passage, he states: "We are delivered from our

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[10] See Theodor Lipps, *Vom Fuehlen, Wollen und Denken* (Leipzig: Verlag von Johann Ambrosius Barth, 1902), pp. 6-7.

[11] Worringer, *Abstraction and Empathy*, p. 5.

[12] The term 'aesthetics' derives from the ancient Greek *aisthesis*, which is translated as perception or sensation. See Francis E. Peters, *Greek Philosophical Terms: A Historical Lexicon* (New York: New York University Press, 1967), pp. 8-15.

[13] Worringer, *Abstraction and Empathy*, p. 23.

[14] Ibid., p. 13.

[15] Ibid., p. 14.

[16] Ibid., p. 16.

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".[17]

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 us.[18]

Thus, we arrive at the following formula: "In this self-objectification lies a self-alienation".[19]

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".[20] 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.

To provide an explanation of the process involved in aesthetic experience, John Dewey, in 1934, coined and developed the locution "art as experience".[21] First, he provides a definition of experience in general:

> 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 emerges.[22]

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[17] Ibid., pp. 23-24.
[18] Ibid., p. 24.
[19] Ibid.
[20] Ibid., p. 25.
[21] See John Dewey, *Art as Experience* (New York: Perigee, 2005).
[22] Ibid., p. 35.

From this passage, it emerges that experience is continuous and involves emotions. In fact, further on, Dewey states that "experience is emotional" and that "emotions are attached to events and objects in their movement".[23] 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 lives.[24]

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; this interaction may refer to what Worringer calls empathy, which is the result of a (cognitive, emotional, or somatic) link established between the perceiver and the object or subject perceived.

In this respect, 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 unfortunate.[25]

As this extract illustrates, Dewey asserts 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": an 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".[26] Thus, Dewey's definition of "aesthetic" is not only in line with the original meaning of the term *aisthesis*—the one

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[23] Ibid., p. 42.
[24] Ibid., pp. 43-44.
[25] Ibid., p. 46.
[26] Ibid., p. 47.

provided by ancient Greek philosophers first and by Alexander Gottlieb Baumgarten[27] thereafter (i.e. perception and sensation)—but also comprises some of the concepts that Worringer associates with the term, that is, experience, enjoyment, and perception. In this sense, the term "aesthetic" denotes "the consumer's rather than the producer's standpoint".[28] 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".[29]

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".[30] 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. This is seemingly confirmed in another passage, where he states that art unites the doing and undergoing: "art, in its form, unites the very same relation of doing and undergoing, outgoing and incoming energy, that makes an experience to be an experience".[31] In other words, Dewey links the process of creation with that of perception: "What is done and what is undergone are thus reciprocally, cumulatively, and continuously instrumental to each other".[32]

Dewey then reaches another important point: a 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".[33] This is because "to perceive, a beholder must *create* his own experience. And his creation must include relations comparable to those which the original producer underwent".[34] It follows that in order for the work observed to be understood, what the artist creates must be recreated in the beholder's mind:

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[27] See Alexander Gottlieb Baumgarten, *Reflections on Poetry*, trans. by Karl Aschenbrenner and William B. Holther (Berkeley and Los Angeles: University of California Press, 1954); and Baumgarten, *Aesthetica*, 2 vols (impens. I.C. Kleyb, 1750).
[28] Dewey, *Art as Experience*, p. 47.
[29] Ibid.
[30] Ibid., pp. 46-47.
[31] Ibid., p. 48.
[32] Ibid., p. 50.
[33] Ibid., p. 54.
[34] Ibid.

> 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 interest.[35]

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".[36] According to Dewey, then, art can be apprehended through the senses, at a visceral, empathic, and emotional level. This is precisely the approach that the current research undertakes in its investigation of the aesthetic responses of beholders to incompleteness, that is, to figures representing suggested movements, artworks presenting a rough surface, and artworks depicting missing parts.

In 1948, Maurice Merleau-Ponty analysed the work of Paul Cézanne, applying those phenomenological investigations to the human capacities of seeing, sensing, and perceiving he undertook years earlier in his magnum opus *Phenomenology of Perception* (1945), giving special attention to the human senses.[37] In *Cézanne's Doubt*, he describes the role of the artist, the work of art, and the observer in the following terms:

> It is not enough for a painter like Cézanne, an artist, or a philosopher, to create and express an idea; they must also awaken the experiences which will make their idea take root in the consciousness of others. If a work is successful, it has the strange power of being self-teaching. The reader or spectator, by following the clues of the book or painting, by establishing the concurring points of internal evidence and being brought up short when straying too far to the left or right, guided by the confused clarity of style, will in the end find what was intended to be communicated. The painter can do no more than construct an image; he must wait for this image to come to life for other people. When it does, the work of art will have united these separate lives; it will no longer exist in only one of them like a stubborn dream or a persistent delirium, nor will it exist only in space as a colored piece of canvas. It will dwell undivided in several minds, with a claim on every possible mind like a perennial acquisition.[38]

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[35] Ibid.

[36] Ibid., p. 51.

[37] See Maurice Merleau-Ponty, *Cézanne's Doubt*, in id., *Sense and Non-Sense*, trans. by Hubert L. Dreyfus and Patricia Allen Dreyfus (Evanston: Northwestern University Press, 1964), pp. 9-25; and Merleau-Ponty, *Phenomenology of Perception*, trans. by Donald A. Landes (London and New York: Routledge, 2014).

[38] Merleau-Ponty, *Cézanne's Doubt*, pp. 19-20.

In this passage, Merleau-Ponty expresses the idea that the role of the artist is not limited to the creation of images, but rather his or her artworks should also contain the necessary elements to facilitate an aesthetic experience in the beholder. This is what the author calls the "power" of the work of art. In this way, the artist constructs the image and, through it, communicates a visual message. On the other hand, the observer receives the message and, if the work is successful, experiences the work itself, which comes to life in his or her mind, where it persists in memory.

A further contribution to the study of the mental processes involved in art contemplation is offered by Ernst Gombrich, who, in *Art & Illusion: A Study in the Psychology of Pictorial Representation* (1960), formulates the concept of the "beholder's share".[39] With this term, he describes how beholders deal with images presenting illusions. His argument is in line with Dewey's: the beholder is called to (mentally) re-create the image observed to make sense of it. In other words, he discusses "the beholder's share in the readings of images, his capacity, that is, to collaborate with the artist and to transform a piece of coloured canvas into a likeness of the visible world".[40] Linked to the concept of the beholder's share is that of the mental set, that is, the

> state of readiness to start projecting, to thrust out the tentacles of phantom colours and phantom images which always flicker around our perceptions. And what we call 'reading' an image may perhaps be better described as testing it for its potentialities.[41]

In this sense, unfinished artworks are excellent examples of images in which the collaboration between the maker and the viewer is critical, inasmuch as the latter must mentally contribute to the creation of the work to make sense of it—in other words, to complete it in his or her mind.

Edgar Wind also stressed the importance of the role of the viewer in art. In his *Art and Anarchy* (1963), for example, he calls attention to the phenomenon of aesthetic enjoyment:

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[39] See Gombrich, *Art & Illusion*.
[40] Ibid., p. 246.
[41] Ibid., p. 190.

> It might be useful to inquire what we ourselves, in the enjoyment of art, might do, or refrain from doing, to render our participation in art more vital. And being an art historian by training, my thoughts turns first to some of the failings of my own profession: for there is no denying that we have made a contribution to the dehumanising of artistic perception.[42]

Thus, Wind believes that the ultimate aim of art is to bring delight to the viewer through pure contemplation:

> There is one—and only one—test for the artistic relevance of an interpretation: it must heighten our perception of the object and thereby increase our aesthetic delight. If the object looks just as it looked before, except that a burdensome superstructure has been added, the interpretation is aesthetically useless, whatever historical or other merits it may have.[43]

Relatedly, one of the aims of this thesis is to investigate how the unfinished may foster aesthetic delight and participation in the beholder.

In her 1966 *Against Interpretation*, Susan Sontag seems to follow the tradition of thought just outlined. She compares and contrasts two different attitudes towards art: interpretation and experience, suggesting that it is time to come to terms with the second:

> Once upon a time (a time when high art was scarce), it must have been a revolutionary and creative move to interpret works of art. Now it is not. What we decidedly do not need now is further to assimilate Art into Thought, or (worse yet) Art into Culture.[44]

Sontag is critical of an intellectual approach to art and, at the same time, she recognises the importance of sensorial experience in art perception, writing "what is important now is to recover our senses. We must learn to *see* more, to *hear* more, to *feel* more".[45] Sontag suggests greater attention to the forms within works of art rather than their content:

> Our task is not to find the maximum amount of content in a work of art, much less to squeeze more content out of the work than is already there. Our task is to cut back content so that we can see the thing at all.[46]

It follows that a new approach to critique should take shape:

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[42] Edgar Wind, *Art and Anarchy* (London and New York: Random House, 1969), p. 21.
[43] Ibid., p. 62.
[44] Susan Sontag, "Against Interpretation", in id., *Against Interpretation and Other Essays* (London: Penguin, 2009), pp. 3-14 (13).
[45] Ibid., p. 14.
[46] Ibid.

> The aim of all commentary on art now should be to make works of art—and, by analogy, our own experience—more, rather than less, real to us. The function of criticism should be to show *how it is what it is*, even *that it is what it is*, rather than to show *what it means*.[47]

In other words, as Sontag states in a sentence that sounds programmatic, "in place of a hermeneutics we need an erotics of art".[48]

In more recent years, neuroscientific and neuroaesthetic studies have been produced in an attempt to unveil the biological basis of aesthetic experience. This has been made possible by important contributions in the field of cognitive neurosciences toward a better understanding of the functions of the human brain, with direct and significant resonances in the history of art and aesthetics. Encounters between art and neuroscience have allowed scholars to produce original interpretations of works of art —particularly those that emphasise the representation of motions and emotions—and aesthetic concepts such as empathy and beauty—opening up an authentically new field of research: neuroaesthetics.[49]

The fusion of these three disciplines—history of art, aesthetics, and neuroscience —conceived a new interdisciplinary approach, which has its roots in the philosophical, aesthetic, and art historical debates inaugurated by some of the most important philosophers, art historians, psychologists, and neuroscientists of the nineteenth and twentieth centuries. The field of research that investigates the relations between art creation and art perception on the basis of the functioning of the human brain was inaugurated by Gustav Fechner in the nineteenth century, in contrast to the tradition of speculative aesthetics represented by the works of Immanuel Kant,

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[47] Ibid.

[48] Ibid.

[49] For the neuroaesthetic investigations of the representation of motions and emotions see, for instance, Vittorio Gallese and coworkers' fresh interpretation of Lucio Fontana's *Concetto spaziale* (1956) and Eugenie Paultre's *Senza titolo* (2016) in Vittorio Gallese et al., "Behavioral and Autonomic Responses to Real and Digital Reproductions of Works of Art", *Progress in Brain Research*, 237 (2018), pp. 201-221; and David Freedberg's new reading of Rogier van der Weyden's *Descent from the Cross* in David Freedberg, "Memory in Art: History and the Neuroscience of Response", in *The Memory Process: Neuroscientific and Humanistic Perspectives*, ed. by Suzanne Nalbantian et al. (Cambridge, MA: MIT Press, 2011), pp. 337-358. For the neuroaesthetic studies on empathy, see Freedberg, "From Absorption to Judgment: Empathy in Aesthetic Response", in *Empathy: Epistemic Problems and Cultural-Historical Perspectives of a Cross-Disciplinary Concept*, ed. by Vanessa Lux and Sigrid Weigel (New York: Palgrave MacMillan, 2017), pp. 139-180. For the neuroaesthetic research on beauty, see Tomohiro Ishizu and Semir Zeki, "A Neurobiological Enquiry into the Origins of Our Experience of the Sublime and Beautiful", *Frontiers in Human Neuroscience*, 8 (2014), pp. 1-10; and Ishizu and Zeki, "Toward a Brain-Based Theory of Beauty", *PLoS ONE*, 6 (2011), pp. 1-10.

Friedrich Schelling, and Georg Wilhelm Friedrich Hegel.[50] Fechner developed this new approach to the study of art, which he termed "experimental aesthetics", because, as he states, "what is still missing is just this empirical foundation".[51] In his *Elements of Psychophysics* (1860), Fechner formulates the theory that laid the foundation of neuroscience.[52] In this text, he adopts the term "psychophysics" to refer to the neural processes, as yet unobserved, that lie between stimulus and sensation. In his *Introduction to Aesthetics* (1876), Fechner applies this theory to the study of art, explaining that aesthetics must proceed, like any other science, by utilising empirical data to develop aesthetic concepts inductively.[53]

Whereas Fechner was the first scientist to adopt an empirical approach to investigate art, Aby Warburg was one of the first art historians to realise that an in-depth study of images requires an investigation that breaks the boundaries determined by the fragmentation of disciplines and that most of the problems and phenomena they contain can be solved only by relying on a cross-disciplinary and comparative approach.[54] For this reason, Warburg lays the foundation for a dialogue between the humanities and the natural sciences, particularly biology, stating, "I had acquired an honest disgust of aestheticising art history. The formal approach to the image—devoid of understanding of its biological necessity as a product between religion and art…

[50] For more on Gustav Fechner's method of research, see Jay Hetrick, "Aisthesis in Radical Empiricism: Gustav Fechner's Psychophysics and Experimental Aesthetics", *Proceedings of the European Society for Aesthetics*, 3 (2011), pp. 139-153. For the most representative works in the ambit of speculative aesthetics of Kant, Schelling, and Hegel, see Immanuel Kant, *Critique of the Power of Judgment*, trans. by Paul Guyer and Eric Matthews, ed. by Paul Guyer (Cambridge: Cambridge University Press, 2000); Friedrich Wilhelm Joseph Schelling, *The Philosophy of Art*, trans. and ed. by Douglas W. Stott (Minneapolis: University of Minnesota Press, 1989); and Georg Wilhelm Friedrich Hegel, *Aesthetics: Lectures on Fine Art*, trans. by Thomas M. Knox, 2 vols (Oxford: Clarendon Press, 1975).

[51] Gustav Fechner, "Aesthetics from Above and from Below", in *Art in Theory: 1815–1900*, trans. by Jason Gaiger, ed. by Charles Harrison and Paul Wood (London: Blackwell, 1998), pp. 632-636 (634).

[52] Fechner, *Elements of Psychophysics*, trans. by Helmut E. Adler, ed. by Davis H. Howes and Edwin G. Boring (New York and London: Holt, Rinehart and Winston, 1966).

[53] Fechner, *Vorschule der Aesthetik* (Leipzig: Breitkopf & Härtel, 1897–1898).

[54] See Warburg, *The Renewal of Pagan Antiquity: Contributions to the Cultural History of the European Renaissance,* trans. by David Britt (Los Angeles: Getty Research Institute for the History of Art and the Humanities, 1999). Warburg's new method consisted in a comparative approach to the study of visual images that took into account different genres, ages and cultures. For more on Warburg's method, see Matthew Rampley, "From Symbol to Allegory: Aby Warburg's Theory of Art", *The Art Bulletin*, 79 (1997), pp. 41-55; and Wind, *The Eloquence of Symbols: Studies in Humanist Art*, ed. by Jaynie Anderson (Oxford and New York: Oxford University Press and Clarendon Press, 1983), pp. 21-35.

appeared to me to lead merely to barren word-mongering".[55] To accomplish his aim, Warburg, after having finished his dissertation in December 1891, attended lectures on psychology at the Faculty of Medicine in Berlin.[56] The study of human neurophysiology applied to art helped him coin a series of novel concepts and theories, all rooted in biological, such as the concepts of *Nachleben*, *Dynamogram*, and *Pathosformel* and the theory of collective or cultural memory.[57]

The works of Rudolf Arnheim and Ernst Gombrich also take into account the contemporary discoveries and theories in the field of the psychology of perception while addressing their arguments.[58] Both Arnheim, in *Art and Visual Perception: A Psychology of the Creative Eye* (1954), and Gombrich, in *Art & Illusion: A Study in the Psychology of Pictorial Representation*, investigate works of art and images in which the formal features present visual problems that the observer must solve for an accurate understanding. Their attempt was to understand how beholders may visually resolve formal illusions by investigating the psychological mechanisms involved in a given perceptual phenomenon.

The results achieved by Warburg, Arnheim, and Gombrich have been carried forward by a series of scholars who consider formal aspects of visual images in light of recent advances in the fields of experimental psychology and cognitive neurosciences.[59] Since the 1990s, various artistic concepts, principles, and patterns have been investigated according to the brain areas or networks that correspond to

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[55] Gombrich, *Aby Warburg: An Intellectual Biography* (London: The Warburg Institute, 1970), pp. 88-89: "Ausserdem hatte ich vor der ästhetisierenden Kunstgeschichte einen aufrichtigen Ekel bekommen. Die formale Betrachtung des Bildes—unbegriffen als biologisch notwendiges Produkt zwischen Religion und Kunstübung…schien mir ein steriles Wortgeschäft hervorzurufen…". Translated in Gombrich, *Aby Warburg*, pp. 88-89. Warburg, as reported by Gombrich, wrote this text in a draft for the lecture on the *Serpent Ritual* on 17 March 1923.

[56] Ibid., p. 67.

[57] For the biological roots of Warburg's concepts and theory, see Claudia Wedepohl, "Mnemonics, Mneme and Mnemosyne. Aby Warburg's Theory of Memory", *Bruniana & Campanelliana*, 2 (2014), pp. 385-402; and Gombrich, *Aby Warburg*, p. 84.

[58] See Rudolf Arnheim, *Art and Visual Perception: A Psychology of the Creative Eye* (Berkeley and Los Angeles: University of California Press, 1954); Gombrich, *Art & Illusion*; and Gombrich, "On Physiognomic Perception", in id., *Meditations on a Hobby Horse and Other Essays on the Theory of Art* (London: Phaidon Press, 1963), pp. 45-55.

[59] Along with the works of Rudolf Arnheim and Ernst Gombrich on the psychology of art, there is also the doctoral thesis of Jennifer Montagu, a student of Gombrich at the Warburg Institute, completed in 1959 and published in 1994. See Jennifer Montagu, *The Expression of the Passions: The Origin and Influence of Charles Le Brun's "Conférence sur l'expression générale et particulière"* (New Haven, CT: Yale University Press, 1994).

specific mental faculties that may be activated during the observation of specific characteristics, qualities, or properties of works of art.[60] These studies attempt to explain what art is and how we experience it, showing invariant universal perceptual mechanisms on the basis of physiological, psychological, and neurological knowledge.

Among these studies, one direction of research deserves special attention because of its relevance to the problems addressed in the present thesis, that is, the works of David Freedberg and Vittorio Gallese, who offer a fresh perspective on a number of phenomena related to art perception. The main aspects studied by Freedberg and Gallese include: the aesthetic responses to the depiction of movements and gestures, both in painting and sculpture; the aesthetic responses to the depiction of emotions and the role of beholders' feelings, or so-called felt-emotions, during their contemplation; and the role of empathy, which the beholder may establish with the figures observed, and the embodied simulation (of the actions and/or emotions observed) during the aesthetic experience.[61]

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[60] See, for instance, Ellen Winner, *How Art Works: A Psychological Exploration* (New York, NY: Oxford University Press, 2019); John Onians, *European Art: A Neuroarthistory* (London and New Haven, CT: Yale University Press, 2016); Ishizu and Zeki, "The Brain's Specialized Systems for Aesthetic and Perceptual Judgment", *European Journal of Neuroscience*, 37 (2013), pp. 1413-1420; Eric R. Kandel, *The Age of Insight: The Quest to Understand the Unconscious in Art, Mind, and Brain, from Vienna 1900 to the Present* (New York: Random House, 2012); Siri Hustvedt, "Embodied Visions: What Does it Mean to Look at a Work of Art", *The Yale Review*, 98 (2010), pp. 22-38; Andrea Pinotti, "Neuroestetica, estetica psicologica, estetica fenomenologica: le ragioni di un dialogo", *Rivista di Estetica*, 37 (2008), pp. 147-168; Onians, *Neuroarthistory: From Aristotle and Pliny to Baxandall and Zeki* (London and New Haven, CT: Yale University Press, 2008); Paul Locher et al. (eds), *New Directions in Aesthetics, Creativity and the Arts* (Amityville, NY: Baywood Publishing Company, 2006); Hustvedt, *Mysteries of the Rectangle: Essays on Painting* (New York: Princeton Architectural Press, 2005); Margaret Livingstone, *Vision and Art: The Biology of Seeing* (New York: Harry N. Abrams, 2002); Vilayanur S. Ramachandran, *The Emerging Mind* (London: Profile, 2003); Ramachandran, "The Science of Art: A Neurological Theory of Aesthetic Experience", *Journal of Consciousness Studies*, 6 (1999), pp. 6-7; Zeki, "Art and the Brain", *Journal of Consciousness Studies*, 6 (1999), pp. 76-96; Zeki, *Inner Vision: An Exploration of Art and the Brain* (Oxford: Oxford University Press, 1999); Robert L. Solso, *Cognition and the Visual Arts* (Cambridge, MA: MIT Press, 1996); Lamberto Maffei and Adriana Fiorentini, *Arte e Cervello* (Bologna: Zanichelli, 1995); Jean-Pierre Changeux, "Art and Neuroscience", *Leonardo*, 27 (1994), pp. 189-201; and Ian Christopher McManus et al., "The Aesthetics of Composition: A Study of Mondrian", *Empirical Studies of the Arts*, 11 (1993), pp. 83-94. See also the recent collection of essays, most of which have been written by psychologists and neuroscientists, in Joseph P. Huston et al. (eds), *Art, Aesthetics and the Brain* (Oxford: Oxford University Press, 2015).

[61] See, for example, David Freedberg and Vittorio Gallese's first two studies carried out together, Freedberg and Gallese, "Motion, Emotion and Empathy in Aesthetic Experience", *TRENDS in Cognitive Sciences*, 11 (2007), pp. 197-203; and Gallese and Freedberg, "Mirror and Canonical Neurons are Crucial Elements in Esthetic Response", *TRENDS in Cognitive Sciences*, 11 (2007), p. 411.

The discovery of mirror neurons in the human brain plays a critical role in the research of both scholars. Mirror neurons are a type of visuomotor neurons that were first discovered in area F5 of the monkey premotor cortex in 1992 by a team of neuroscientists composed of Giacomo Rizzolatti, Luciano Fadiga, Leonardo Fogassi, and Vittorio Gallese.[62] Subsequent neurophysiological experiments indicate that mirror neurons are also present in humans, precisely in the ventral premotor cortex (encompassing Brodmann's area 44) and posterior parietal cortex.[63] The importance of this class of visuomotor neurons in daily life is significant because they are involved in critical tasks. Because they activate during the execution, observation, and imagination of purposeful actions (such as reaching out, grasping, and holding), mirror neurons are responsible for the understanding of the actions performed by ourselves and others. This is why they seem to play an important role in intersubjectivity and empathy.[64] Moreover, because they allow us to understand, through a process of inner simulation, the actions we observe, they also contribute to the domain of imitation learning.[65] For the reasons discussed, the functions of mirror neurons comprise the foundation of Gallese's embodied simulation theory, that is, the idea according to which purposeful actions, gestures, and emotions—observed or

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[62] For more on mirror neurons, see Giacomo Rizzolatti and Laila Craighero, "The Mirror-Neuron System", *Annual Review Neuroscience*, 27 (2004), pp. 169-192; Rizzolatti et al., "Neurophysiological Mechanisms Underlying the Understanding and Imitation of Action", *Nature Reviews Neuroscience*, 2 (2001), pp. 661-670; Rizzolatti et al., "Resonance Behaviors and Mirror Neurons", *Archives Italiennes de Biologie*, 137 (1999), pp. 85-100; Rizzolatti and Luciano Fadiga, "Grasping Objects and Grasping Action Meanings: The Dual Role of Monkey Rostroventral Premotor Cortex (Area F5)", *Novartis Foundation Symposium*, 218 (1998), pp. 81-103; and Rizzolatti et al., "Premotor Cortex and the Recognition of Motor Actions", *Cognitive Brain Research*, 3 (1996), pp. 131-141.

[63] For more on mirror neurons in humans, see Rizzolatti and Corrado Sinigaglia, *Mirrors in the Brain: How our Minds Share Actions and Emotions* (Oxford: Oxford University Press, 2008); and Rizzolatti, "The Mirror Neuron System and Its Function in Humans", *Anatomy and Embryology*, 210 (2005), pp. 419-421.

[64] For the neuroscience of intersubjectivity and empathy, see Massimo Ammaniti and Gallese, *The Birth of Intersubjectivity: Psychodynamics, Neurobiology, and the Self* (New York: W. W. Norton & Company, 2014); and Gallese, "The 'Shared Manifold' Hypothesis: From Mirror Neurons to Empathy", *Journal of Consciousness Studies*, 8 (2001), pp. 33-50.

[65] For more on imitation learning, see, for instance, Giovanni Buccino et al., "Neural Circuits Underlying Imitation Learning of Hand Actions: An Event-Related fMRI Study", *Neuron*, 42 (2004), pp. 323-334.

imagined—both in reality and represented in still works of art, are inwardly simulated or executed by the observer.[66]

Since 2007, Freedberg, Gallese, and scholars with whom they collaborated have studied the neural basis of aesthetic responses to static images, focusing mainly on the representation of motions and emotions. In doing so, they have re-introduced the notions of empathy, emotion, and feeling in art history from a scientific perspective, proposing that beholders understand art also at an emotive and empathic level. Freedberg, for example, has deepened, in a series of studies, our understanding of the relationship between the representation of specific gestures or scenes and the emotions they express to indicate how beholders biologically respond to them.[67] He has focused on whether beholders experience the same emotion they see expressed in the figures depicted in front of them. He has done so by applying empirical findings based on the perception of emotions and goal-oriented actions, both in real life and in the visual arts, to the study of the representation of human figures. He has explored

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[66] For more on Vittorio Gallese's embodied simulation theory, see Gallese and Michele Guerra, *The Empathic Screen: Cinema and Neuroscience* (Oxford: Oxford University Press, 2019); Gallese, "Embodied Simulation and Its Role in Cognition", *Reti, saperi, linguaggi*, 1 (2018), pp. 31-46; Gallese, "Visions of the Body. Embodied Simulation and Aesthetic Experience", *Aisthesis*, 10 (2017), pp. 41-50; Gallese, "Arte, corpo, cervello: per un'estetica sperimentale", *Micro Mega*, 2 (2014), pp. 49-67; Gallese, "Embodied Simulation Theory: Imagination and Narrative", *Neuropsychoanalysis*, 13 (2011), pp. 196-200; and Gallese, "Embodied Simulation: From Neurons to Phenomenal Experience", *Phenomenology and the Cognitive Sciences*, 4 (2005), pp. 23-48.

[67] See, for example, Freedberg, *From Absorption to Judgment*; Freedberg, "Feelings on Faces. From Physiognomics to Neuroscience", in *Rethinking Emotion. Interiority and Exteriority in Premodern, Modern, and Contemporary Thought*, ed. by Rüdiger Campe and Julia Weber (Berlin: De Gruyter, 2014), pp. 289-324; Freedberg, "Memory in Art: History and the Neuroscience of Response", in *The Memory Process: Neuroscientific and Humanistic Perspectives*, ed. by Suzanne Nalbantian, Paul M. Matthews and James L. McClelland (Cambridge, MA: MIT Press, 2011), pp. 337-358; Freedberg, "Choirs of Praise: Some Aspects of Action Understanding in Fifteenth Century Painting and Sculpture", in *Medieval Renaissance Baroque: A Cat's Cradle for Marilyn Aronberg*, ed. by David Levine and Jack Freiberg (New York: Italica Press, 2010), pp. 65-81; Freedberg, "Movement, Embodiment, Emotion", in *Cannibalismes Disciplinaires. Quand l'histoire de l'art et l'anthropologie se rencontrent*, ed. by Thierry Dufrêne and Anne-Christine Taylor (Paris: Musée du quai Branly, 2010), pp. 37-61; Freedberg, "Immagini e risposta emotiva: la prospettiva neuroscientifica", in *Prospettiva Zeri*, ed. by Anna Ottani Cavina (Turin: Umberto Allemandi, 2008), pp. 85-105; and Freedberg, "Empathy, Motion and Emotion", in *Wie sich Gefühle Ausdruck verschaffen: Emotionen in Nahsicht*, ed. by Klaus Herding and Antje Krause-Wahl (Berlin: Driesen, 2008), pp. 17-51.

these aspects also in collaboration with neuroscientists.[68] Gallese, for his part, has
applied the embodied simulation theory he formulated years earlier to study responses
to works of art, collaborating, much of the time, with a team of researchers.[69]

Building on this tradition and method of investigation, the current project casts
light on the phenomenon of the unfinished in the visual arts, particularly in painting,
sculpture, drawing, and print. Because a consistent and systematic study on the
phenomenon of the unfinished has not yet been accomplished, the aim of this work is
twofold: (*i*) to explore the meaning and morphologies of the unfinished and its
aesthetic implications and (*ii*) to propose a method to investigate its impact on the
observer. To address the first objective, I will identify a series of categories of
unfinished works of art according to their visual appearances and the written sources
that refer to them. For the same purpose, I will examine the debate on the unfinished,
both in classical antiquity and in the Italian Renaissance, in relation to the forming of
what I call the *canon of finiteness*. In dealing with the second aspect, both the
pedagogical function of the unfinished, which is the interpretation offered by ancient

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[68] For the studies conducted by David Freedberg in cooperation with neuroscientists see fn. 61 and, additionally, Ludovico Mineo et al., "Motor Facilitation during Observation of Implied Motion: Evidence for a Role of the Left Dorsolateral Prefrontal Cortex", *International Journal of Psychophysiology*, 128 (2018), pp. 47-51; Carmen Concerto et al., "Observation of Implied Motion in a Work of Art Modulates Cortical Connectivity and Plasticity", *Journal of Exercise Rehabilitation*, 12 (2016), pp. 417-423; Concerto et al., "Neural Circuits Underlying Motor Facilitation during Observation of Implied Motion", *Somatosensory & Motor Research*, (2015), pp. 1-4; Ulrich Kirk and Freedberg, "Contextual Bias and Insulation against Bias during Aesthetic Rating. The Roles of VMPFC and DLPFC in Neural Valuation", in *Art, Aesthetics and the Brain*, ed. by Joseph P. Huston et al. (Oxford: Oxford University Press, 2015), pp. 158-173; Beatrice Sbriscia-Fioretti et al., "ERP Modulation during Observation of Abstract Paintings by Franz Kline", *PLoS ONE*, 8 (2013), pp. 1-12; Maria Alessandra Umiltà et al., "Abstract Art and Cortical Motor Activation: An EEG Study", *Frontiers in Human Neuroscience*, 6 (2012), pp. 1-9; and Fortunato Battaglia et al., "Corticomotor Excitability during Observation and Imagination of a Work of Art", *Frontiers in Human Neuroscience*, 5 (2011), pp. 1-6.

[69] See, for example, Gallese et al., *Behavioral and Autonomic Responses to Real and Digital Reproductions of Works of Art*; Gallese, *Visions of the Body*; Cinzia Di Dio et al., "Human, Nature, Dynamism: The Effects of Content and Movement Perception on Brain Activations during the Aesthetic Judgment of Representational Paintings", *Frontiers in Human Neuroscience*, 9 (2015), pp. 1-19; Gallese, *Arte, corpo, cervello*; Katrin Heimann, Umiltà and Gallese, "How the Motor-Cortex Distinguishes Among Letters, Unknown Symbols and Scribbles. A High Density EEG Study", *Neuropsychologia*, 51 (2013), pp. 2833-2840; Gallese and Di Dio, "Neuroesthetics: The Body in Esthetic Experience", in *The Encyclopedia of Human Behavior*, ed. by Vilayanur S. Ramachandran, 3 vols (London: Elsevier Academic Press, 2012), II, pp. 687-693; Fausto Caruana and Gallese, "Sentire, esprimere, comprendere le emozioni: una nuova prospettiva neuroscientifica", *Sistemi Intelligenti*, 2 (2011), pp. 223-233; Gallese, "Seeing Art … Beyond Vision. Liberated Embodied Simulation in Aesthetic Experience", in *Seeing with the Eyes Closed. Association for Neuroesthetics Symposium at the Guggenheim Collection*, ed. by Alexander Abbushi et al. (Berlin: Association for Neuroesthetics, 2011), pp. 62-65; Di Dio and Gallese, "Neuroaesthetics: A Review", *Current Opinion in Neurobiology*, 19 (2009), pp. 682-687; and Di Dio, Emiliano Macaluso and Rizzolatti, "The Golden Beauty: Brain Response to Classical and Renaissance Sculptures", *PLoS ONE*, 11 (2007), pp. 1-9.

and Renaissance authors such as Pliny the Elder, Giorgio Vasari, and Benvenuto Cellini, and its imaginative potential are considered. Therefore, this research engages with neuroscientific literature to explore the extent to which viewers complete in their minds the parts of figures, or aspects of their movements, that are missing.

3 Art Historical Studies on the Unfinished

In recent years, a growing body of art historical literature on the study of the phenomenon of the unfinished has emerged, starting with Paola Barocchi's account of the use of the term "unfinished" (*non finito*) by Giorgio Vasari (1511–1574).[70] The first attempts at a systematic study of this phenomenon consist of two essays, one by Linda Bauer and the other by Linda Bauer and George Bauer, who consider preparatory sketches incomplete images.[71] Additional scholars, such as Juergen Schulz, Paula Carabell, and Creighton E. Gilbert, have focused on Michelangelo's unfinished works.[72] Another Renaissance artist whose name is frequently associated with the concept of incompleteness is Titian. Scholarship on Titian's unfinished work has mainly concentrated on his late output.[73] In addition, paintings and prints by various artists and works in the fields of literature, theatre, and cinema that have been left incomplete by their authors, from the Renaissance to the present day, have recently been subjected to similar scholarly scrutiny.[74]

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[70] See Paola Barocchi, "Finito e non-finito nella critica vasariana", *Arte antica e moderna*, 3 (1958), pp. 221-235.

[71] See Linda Bauer, "Oil Sketches, Unfinished Paintings, and the Inventories of Artists' Estates", in *Light on the Eternal City: Observations and Discoveries in the Art and Architecture of Rome*, ed. by Hellmut Hager and Susan S. Munshower (University Park: Pennsylvania State University, 1987), pp. 93-107; and Linda Bauer and George Bauer, "Artists' Inventories and the Language of the Oil Sketch", *Burlington Magazine*, 141 (1999), pp. 520-530.

[72] See Juergen Schulz, "Michelangelo's Unfinished Works", *The Art Bulletin*, 57 (1975), pp. 366-373; Paula Carabell, "Image and Identity in the Unfinished Works of Michelangelo", *Anthropology and Aesthetics*, 32 (1997), pp. 83-105; and Creighton E. Gilbert, "What Is Expressed in Michelangelo's 'Non-Finito'", *Artibus et Historiae*, 24 (2003), pp. 57-64.

[73] See Augusto Gentili, "Problemi dell'ultimo Tiziano: Finito e non finito tra variazioni e perdite di senso", in *Tiziano: L'ultimo atto*, ed. by Lionello Puppi (Milan: Skira, 2007), pp. 135-143; and Philip L. Sohm, *The Artist Grows Old: The Aging of Art and Artist in Italy, 1500–1800* (London and New Haven, CT: Yale University Press, 2007), pp. 83-103.

[74] See Celeste Farge et al. (eds), *Rodin and the Art of Ancient Greece* (London: Thames & Hudson, 2018); Anna Dolfi, *Non finito, opera interrotta e modernità* (Florence: Florence University Press, 2015); Nico Van Hout, *The Unfinished Painting* (Antwerp: Ludion, 2012); and Peter W. Parshall, *The Unfinished Print* (Aldershot: Lund Humphries, 2001).

Attention to the unfinished has also been the subject of art exhibitions. Among others, it is worth mentioning one organised at the Courtauld Gallery in 2015, titled *Unfinished...Works from the Courtauld Gallery*, and another curated at the Metropolitan Museum of Art in 2016, titled *Unfinished: Thoughts Left Visible*, which was accompanied by a catalogue.[75] The latter made a substantial contribution to the literature on the unfinished, addressing the question "When can a work of art be considered finished?" The exhibition featured a large selection of Western works of art from the classical to the contemporary period, in various media and techniques.

In *Unfinished: Thoughts Left Visible*, a vast number of works of art, which the authors consider unfinished, have been collected together, expanding the definition of "unfinishedness" in the visual arts.[76] The authors argue that, in an incomplete work of art, there are different levels of finiteness, such as an imperfect or rough surface, a sketch effect, or blank spaces. From these distinctions, the authors divide the unfinished into three categories: "unfinished", "seemingly unfinished", and "about unfinishedness".[77] These distinctions of the various appearances of the unfinished in the visual arts represent, for the present study, a starting point for deeper reflection on unfinished works of art and the responses they may arouse in viewers.

4   Neuroaesthetic Studies on the Unfinished

The phenomenon of the unfinished, both in works of art in particular and in visual images in general, has also been investigated by analysing the psychological and neurological responses to incomplete figures, not only human but also animal and geometrical. The literature on this aspect converges in three main areas: the first focuses on the responses to illusory contours, which is a visual illusion that indicates the presence of an edge without a change of light or colour across it—in other words,

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[75] For the exhibition held at the Courtauld Gallery, see the website: <goo.gl/m0i6vo> [accessed 24 September 2016]. For the exhibition held at the Metropolitan Museum of Art, see Kelly Baum et al. (eds), *Unfinished: Thoughts Left Visible* (New York: The Metropolitan Museum of Art, 2016).

[76] Baum et al., "Introduction: An Unfinished History of Art", in *Unfinished: Thoughts Left Visible*, pp. 13-15, 260 (13).

[77] Ibid.

an empty space the visual meaning of which is assigned by what is near (fig. 8); the second concentrates on the responses to ambiguous, or indeterminate, images (fig. 9); and the third deals with the responses to Michelangelo's unfinished sculptures (figs. 10–13).

The first direction of research deals with images that are visually intermittent and tries to assess the human ability to deduce meaningful representation from fragmented shapes.[78] These studies point out the ability of certain brain cells to respond to virtual lines, for example those belonging to the incomplete pattern of the *Kanizsa triangle* (fig. 8). They suggest that the perception of incomplete images is an active process because the beholder is encouraged to construct real objects mentally from blank spaces, even though it is not clear where this precisely happens in the brain. However, Damian Stanly and Nava Rubin's experiment suggests that the incomplete figures represented in Kanizsa's images are likely completed in the early cortex.[79]

The second area of investigation takes into account images that are not easy to recognise, such as those featured in Robert Pepperell's paintings (fig. 9).[80] In this regard, Pepperell and Alumit Ishai's experiment shows that it takes participants longer to respond to indeterminate pictures, which might indicate that greater involvement of cognitive processing is required when dealing with such images.[81] From the data collected by Pepperell and Ishai on the responses to scrambled and indeterminate images, it is possible to conclude that, to mentally resolve vagueness, individuals rely on high cognitive functions, such as mental imagery, visual similarity, visual association, and memory retrieval.

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[78] See Damian A. Stanly and Nava Rubin, "fMRI Activation in Response to Illusory Contours and Salient Regions in the Human Lateral Occipital Complex", *Neuron*, 37 (2003), pp. 323-331; and Jonas Larsson et al., "Neuronal Correlates of Real and Illusory Contour Perception: Functional Anatomy with PET", *European Journal of Neuroscience*, 11 (1999), pp. 4024-4036.

[79] See Stanly and Rubin, *fMRI Activation in Response to Illusory Contours and Salient Regions in the Human Lateral Occipital Complex*. See also Chapter 6.

[80] See Robert C. Pepperell and Alumit Ishai, "Indeterminate Artworks and the Human Brain", in *Art, Aesthetics, and the Brain*, pp. 143-157; Gerald C. Cupchik et al., "Viewing Artworks: Contributions of Cognitive Control and Perceptual Facilitation to Aesthetic Experience", *Brain and Cognition*, 70 (2009), pp. 84-91; Scott L. Fairhall and Ishai, "Neural Correlates of Object Indeterminacy in Art Compositions", *Consciousness and Cognition*, 17 (2008), pp. 923-932; and Dario Gamboni, *Potential Images: Ambiguity and Indeterminacy in Modern Art* (London: Reaktion Books, 2002).

[81] See Pepperell and Ishai, *Indeterminate Artworks and the Human Brain*.

Finally, the third group of studies attempts to address the problem of the perception of Michelangelo's unfinished artworks, although the neuroaesthetic literature on this topic is limited and generic. Semir Zeki was the first within the discipline of neuroaesthetics to deal with Michelangelo's unfinished work.[82] He did so by considering some examples of Michelangelo's interrupted production, which includes statues, reliefs, paintings, and drawings. However, in *Inner Vision: An Exploration of Art and the Brain,* he only mentions one possible response of beholders to the unfinished—that is, the imagination of hidden forms—without providing any biological evidence in support of his claim or clarifying the kind of unfinished he refers.[83]

Zeki expanded upon the phenomenon of Michelangelo's unfinished in a second study, stressing once again its potential for the beholder in neurological terms.[84] In this regard, while referring to the unfinished, he states, "what Michelangelo has done, without acknowledging it, is to leave it to the brain of the spectator to complete it".[85] Moreover, for Zeki, the observation of an unfinished work "engages the brain more intensely" than one that has been finished.[86] Despite the goal of undertaking a cross-disciplinary approach, these statements are not followed by the scientific explanation asserted in the introduction that "all human activity is dictated by the organization and laws of the brain: that therefore, there can be no real theory of art and aesthetics unless neurologically based".[87]

In another article, Zeki addresses the problem of Michelangelo's unfinished by comparing Michelangelo's *Rondanini Pietà* (fig. 14), an unfinished statue, with the incomplete triangle of Kanizsa (fig. 8).[88] However, the main statements, including "in

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[82] Zeki, *Inner Vision*, pp. 22-36.

[83] Evidently, not all unfinished works can have the same characteristics (for instance, the unfinished does not always have hidden forms) and not all typologies of the unfinished can elicit the same response.

[84] Zeki, "Neural Concept Formation & Art: Dante, Michelangelo, Wagner", *Journal of Consciousness Studies*, 9 (2002), pp. 53-76 (65-67).

[85] Ibid., p. 66.

[86] Ibid., p. 67.

[87] Ibid., p. 54. For a detailed review of Zeki's neuroscientific interpretation of art creation and perception, see Amy Ione, "Examining Semir Zeki's 'Neural Concept Formation and Art: Dante, Michelangelo, Wagner'", *Journal of Consciousness Studies*, 10 (2003), pp. 58-66.

[88] Zeki, "The Neurology of Ambiguity", *Consciousness and Cognition*, 13 (2004), pp. 173-196 (190).

trying to make sense of the Kanizsa pattern that constitutes a *Kanizsa triangle*, the brain 'finishes it off'" and "in Michelangelo's *Rondanini Pietà*, the capacity to give multi interpretations is taken yet a step further", are not followed by an accurate and detailed neuroscientific explanation.[89]

David Freedberg and Vittorio Gallese interpret Michelangelo's unfinished works from a neuroscientific perspective as well, although more clearly and precisely than Zeki.[90] They focus on a specific aspect of the unfinished, that is, its potential to facilitate a motor response in the beholder. According to them, in the unfinished sculpture of the *Atlas Slave* (fig. 12), the "responses often take the form of a felt activation of the muscles that appear to be activated within the sculpture itself".[91] This explains why, they argue, "the sense of exertion...is effectively conveyed to the spectator".[92]

Finally, another attempt to investigate Michelangelo's unfinished in neuroaesthetics is provided by Vittorio Gallese and Cinzia di Dio.[93] They see the unfinishedness of the group of Michelangelo's *Slaves* (figs. 10–13) as the key element that strengthens the bodily empathy of art viewers, who, according to the authors, are able "to experience the struggle of the prisoners to free themselves from the stone".[94] Supported by empirical experiments, they propose this interpretation by stressing "the relevance of embodied simulation in art".[95]

The present study intends to take a different angle from those previously mentioned. Considering the sub-personal and pre-reflective level in which most simulations tend to work, as a form of direct perception, this research addresses on the aesthetic responses to suggested movements, implied actions, and incomplete figures, in addition to the role played by the beholder's imagination during such responses. To conclude, most of the originality of this study lies (*i*) in the systematisation of the terminologies and categories of the unfinished; (*ii*) in the investigation of the

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[89] Ibid.
[90] Freedberg and Gallese, *Motion, Emotion and Empathy in Aesthetic Experience*, pp. 197-198.
[91] Ibid., p. 197.
[92] Ibid., p. 198.
[93] Gallese and Di Dio, *Neuroesthetics*, p. 691.
[94] Ibid.
[95] Ibid.

pedagogical function of the unfinished from a biological perspective; and (*iii*) in the enquiry into the biological basis of the activation of the beholder's visual imagination during the observation of incomplete figures and suggested movements.

5 The Outline of the Research

As stated at the beginning of this introduction, the main question that this study seeks to answer is "What is the biological process underlying the perception of and responses to incomplete figures represented in visual works of art in particular, and visual images in general?" In other words, what are the elements, from a neuroaesthetic perspective, that must be investigated to clarify how beholders deal with the invisible in certain circumstances? To address these issues, it is essential to investigate the following topics, which correspond to the chapters of this work: (*i*) the artistic debate on the unfinished and its aesthetic implications; (*ii*) the morphologies of the unfinished and its categories; (*iii*) the phenomenology of aesthetic response; (*iv*) the aesthetic responses to the depiction of suggested (or incomplete) movements; (*v*) the aesthetic responses to rough surfaces of sketched works of art; and (*vi*) the aesthetic responses to the blank spaces sometimes present in the depiction of human figures as a result of an interruption by the artist during the creation of a work of art.

Therefore, this study clarifies various aspects of the unfinished, raising problems and addressing questions to understand how individuals react in the perception of incomplete images and unfinished works of art. In doing so, it argues that (*i*) the classical and Italian Renaissance debate about the unfinished is indicative of the formation of a specific canon referring to the finiteness of works of art; (*ii*) there are different types of the unfinished; (*iii*) the artist's judgement about the level of finiteness of his or her work of art does not necessarily correspond to the beholder's aesthetic perception; (*iv*) different types of unfinished works of art correspond to different responses; (*v*) a variety of mental faculties and brain areas, or networks, are involved during such responses, and they vary according to the type of the unfinished observed; (*vi*) such responses occur, most of the time, at a pre-reflective level; and

(*vii*) previously acquired memories and background knowledge of various aspects of vision are relevant to these responses, but they mainly emerge at an unconscious level, as they are automatic and not mediated by conscious thought.

CHAPTER ONE

The Problem of the Unfinished and the Shaping of the Canon of Finiteness

This chapter addresses the debate on the unfinished in the visual arts from classical antiquity to the Italian Renaissance and its aesthetic implications. It is divided into three sections and constitutes, together with the second chapter, the foundation of my entire investigation.

The first section reflects on what we do not know about the unfinished and why it is important to re-think this phenomenon today. The argument is that recent developments in the fields of cognitive neurosciences and neuroaesthetics enable a fresh interpretation of the phenomenon of the unfinished, shedding new light on some aspects of it. What we learn through these epistemologies offers a novel understanding of the unfinished, particularly in the study of aesthetic responses. Furthermore, the neuroaesthetic perspective facilitates a division of the unfinished into a series of morphological categories, which I will define as: "almost finished", "partly finished", "sketched", and "part missing".

The second section analyses the history of the unfinished, focusing on the debate that unfinished sculptures and paintings have stirred among theorists, artists, and the public. This provides a definition, or a series of definitions, of the notion of the unfinished and enables us to recognise the formation of what I call the *canon of finiteness* in visual works of art. In this regard, based on historical sources, I propose that the aesthetic of finiteness can be divided into three categories: "finished", "unfinished", and "over-finished".

Finally, the third section explores the various solutions that have been adopted in dealing with unfinished works of art—namely, keeping them as such or completing

them through the efforts of other, later artists—in accordance with the canon of finiteness that gradually takes shape.

1 The Necessity of an Investigation into the Unfinished in the Visual Arts

What do we not know about the unfinished? What does it mean to investigate the unfinished today? These are the first questions we should ask in a study of the phenomenon of the unfinished in the visual arts, especially if we wish to give it a more complete definition and a fresh interpretation that employs contemporary epistemological resources. Considering the history of the phenomenon of the unfinished in Western art, two aspects remain to be investigated, one from an aesthetic perspective and the other from a neuroaesthetic perspective. These are the main goals of the present study.

The investigation of the first aspect, the aesthetic, includes the following questions: What is the unfinished? What are the aesthetic implications of the unfinished? And how many types of unfinished works of art can be identified? A clear and exhaustive definition of this phenomenon and its implications for art and its beholders has never been accomplished. To define the unfinished also means to identify, and then analyse, its morphologies, and to clarify the causes of its appearances. Aesthetic reflection on the unfinished may begin with three writings by three different scholars: Monroe C. Beardsley, Paisley Livingston, and Darren Hudson Hick.[96] Particularly relevant is Paisley Livingston's distinction between the concepts of "genetic completion" and "aesthetic completion", which seems to clarify the relationship, or discrepancy, between the aesthetic appearance of an artwork and the beholder's perception of it.[97] This distinction encourages us to reflect more carefully on the process of image-making and the method undertaken by a given artist.[98] Furthermore, the history of the phenomenon of the unfinished, analysed from an

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[96] See Monroe C. Beardsley, "On the Creation of Art", *The Journal of Aesthetics and Art Criticism*, 23 (1965), pp. 291-304; Paisley Livingston, *Art and Intention: A Philosophical Study* (Oxford: Clarendon, 2005); and Darren Hudson Hick, "When is a Work of Art Finished?", *The Journal of Aesthetics and Art Criticism*, 66 (2008), pp. 67-76.
[97] See Livingston, *Art and Intention*.
[98] See § 2.2.

aesthetic point of view, leads us to read the debate on the unfinished as revelatory of the shaping of an aesthetic canon that refers to the status of finiteness in visual works of art: the canon of finiteness.

The investigation of the second aspect, the neuroaesthetic, will consider the responses of beholders to unfinished works of art. This will enable me to shed new light on the power of the unfinished. It is in this sense that recent discoveries and theories in the fields of philosophy of mind, experimental psychology, cognitive neurosciences, and neuroaesthetics may offer the appropriate instruments for a novel understanding of the unfinished. Important developments in these domains provide us with sophisticated information about the functions of the human brain in relation to visual perception of specific image contents, such as movement, emotion, and incomplete forms. These contents may be capable of activating determinate body-brain processes in subjects, such as imagination, mental completion, embodiment, memory, and empathy. In this regard, Ernst Gombrich's concept of "the beholder's share" and David Freedberg's notion of "the power of images" are the ground of this study.[99] Building on their ideas, body-brain processes—such as imagination, mental completion, neural filling-in, mental imagery, motor imagery, embodied simulation, predictive processing, imitation learning, memory, and empathy—are explored. In fact, I hold that these faculties are involved, in different measures, in the responses to different typologies of unfinished works of art. The activation of these and other neural processes point to the power of the unfinished and its effects on the beholder.

The phenomenon of the unfinished undermines the common assumption according to which the visual arts deal exclusively with what is visible. In this sense, it is essential to understand how the unfinished affects the beholder's perception of a work of art. For example, when beholders contemplate an unfinished artwork, focusing on its beauty, on the gestures represented, or on the emotions expressed by the figures, are they in some way "disturbed" by the lacuna? In other words, how do we deal with the invisible, with the unfinished? Addressing this question means

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[99] See Gombrich, *Art & Illusion*; and Freedberg, *The Power of Images: Studies in the History and Theory of Response* (Chicago and London: University of Chicago, 1989).

investigating the role of the beholder's imagination and establishing whether what the artist began is completed in the beholder's mind.

Nowadays, we know with greater precision the neurological processes underlying the perception of determinate images, for instance, those representing movements, gestures, emotions, facial expressions, and incomplete forms. Neuroscience can tell us how we process the human body (both our own and that of others), faces, hands, graphic marks, places, and so on. Empirical studies show us that when we focus on a specific aspect of reality, or artwork, a corresponding area of our brain is activated. This is why this study investigates three specific aspects of incompleteness: (*i*) responses to human figures representing suggested movements; (*ii*) responses to human figures depicted in a sketchy style; and (*iii*) responses to the representation of human figures without faces. My thesis is that these types of artworks, in order to be fully appreciated, requires the intervention of the beholder's imagination.

A neuroaesthetic investigation of the unfinished can also have interesting implications in other branches of the history of art. For instance, the power of the unfinished can have a direct effect on museological strategies. The unfinished, if exhibited, may offer significant information to the viewer, as it shows the process of art creation. For example, observation of the unfinished reveals the path taken by the artist during the realisation of the work, showing the working method (s)he adopted. Viewers can in this way gain understanding of how artists develop their ideas and to what extent they master their techniques. The exhibition of unfinished works of art can also test whether and how the unfinished may have an impact on the shaping of the canon of finiteness and the essence of art itself—revealing whether, for instance, over time a painting with visible brushstrokes is accepted as finished, or accepted as a work of art at all.

Before addressing these issues, it is worth observing that there exist visual representations of the phenomenon of the unfinished, which complement the literature on the subject. One illustrative example is a marble bas-relief by Andrea Pisano (c. 1290–1348/1349), *Phidias or the Art of Sculpture* (fig. 15), dated 1337–1341 and executed for Giotto's Campanile in Florence. The scene shows a sculptor (Phidias)

dealing with the creation of a statue with its face still missing. The second example is by Giorgio Vasari (1511–1574), in his Casa Vasari fresco cycle in Florence. In the scene of the *Stories of Zeuxis* (fig. 16), the bottom part of the figure that an artist is painting is only outlined, thus leaving an empty space in place of the legs. The third example is an etching by Albertus Clouwet (1636–1679), which represents the personification of the notion of Idea, who is painting on an almost blank board (fig. 17). The depiction of the unfinished shows us that artists have always had to deal with it, since it is inherent in the image-making process itself. The fact that the representation of the unfinished often coincides with a specific feature, that is, the inclusion of blank spaces, as these three examples show, is meaningful. The reason for this choice can probably be that a void best epitomises unfinishedness. Maybe this feature helps beholders to recognise it more easily.

This section has pointed out the implications that a systematic and cross-disciplinary study of the unfinished can have for art history, aesthetics, neuroaesthetics, and museology. The answers to the vast range of questions raised by the unfinished can contribute to the resolution of issues from the point of view of the artist, the curator, and the viewer. As we have seen, a study of the unfinished conducted today is particularly exciting due to the new neuroscientific tools at our disposal. In fact, an exploration of a series of theories based on recent neuroscientific discoveries allows us to undertake an innovative interpretation of this phenomenon and a comprehensive definition of its meaning, morphologies, and power.

2 A Systematisation of the Terminologies Related to the Unfinished: From Cicero and Pliny the Elder to the Italian Renaissance

What is the unfinished? What are the aesthetic implications of the unfinished? To answer these questions, this section analyses the history of the debate on the phenomenon of the unfinished in the visual arts from classical antiquity to the Italian Renaissance, which, I claim, shows the existence of an aesthetic canon referring to the status of finiteness of works of art—that is, the level of smoothness of an artwork's surface. As sources suggest, the canon of finiteness is not stable, but instead varies

with different centuries and cultural contexts, and sometimes from artist to artist and from viewer to viewer. From the discussions on the finiteness of artworks belonging to the periods and contexts included in the present study, we may deduce that the decision about what is finished and what is not is something that concerns the artist as well as the beholder. Whereas the former may deliberately decide to leave his or her work unfinished for reasons linked to stylistic innovations, the latter, when (s)he perceives it as such, may be subject to a particular aesthetic response that may involve his or her memory as well as his or her imagination. For this reason, a neuroaesthetic perspective may shed new light on the phenomenon of the unfinished, pointing to the elements that give this phenomenon its power. But first, it is worth exploring the texts that inaugurated the aesthetic debate on the unfinished and, I argue, structured the formation of the canon of finiteness in Western art.

The attention to the general category of the finiteness of works of art and, consequently, to the phenomenon of the unfinished, has a long history, which spans from classical antiquity to the present day. Both the interest in incomplete works of art and the reflection on the phenomenon of finiteness in the visual arts have been documented since the writings of Cicero (106 BC–43 BC) and Pliny the Elder (23–79).[100] The term "unfinished" refers to a particular condition of a work of art; in this condition, the work features figures or forms that have not been completed by the artist. This condition can be the result of either an involuntary interruption or a deliberate choice. In the Italian Renaissance, the unfinished as an aesthetic choice was pioneered by Donatello (1386–1466) in Florence and by Titian (1488/1490–1576) and Jacopo Tintoretto (c. 1518–1594) in Venice; whereas the majority of the sculptures of Michelangelo Buonarroti (1475–1564) may, I believe, be taken to epitomise the unfinished as a result of unforeseen circumstances. In both cases, the unfinished can refer to different degrees of finiteness, ranging from an artwork that has not been refined to the highest degree to works that include blank spaces in place of some significant parts of a figure—contours, faces, limbs, etc.

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[100] See Cicero, "Letter 20. Cicero to Lentulus Spinther", in id., *Letters to Friend*, ed. and trans. by David R. Shackleton Bailey, 3 vols (Cambridge, MA, and London: Harvard University Press, 2001), I, pp. 116-152; and Pliny the Elder, *Natural History*, trans. by Harris Rackham, 10 vols (Cambridge, MA, and London: Harvard University Press and William Heinemann, 1938–1967).

From classical antiquity to the Renaissance, different terminologies referring to the unfinished in all its different configurations were employed. Cicero, for example, talking about Apelles' *Venus*, a statue, describes the part of the figure under the bust being in an "unfinished" (*incohatam*) state, adding that the artist left it "imperfect" (*imperfectum*) and "rough" (*rude*):

> Certain persons in my case have followed the example of Apelles, who applied the utmost refinement of his art to perfecting the head and bust of his Venus, but left the rest of the body a mere sketch—they made a finished job of the capital section only, leaving the rest unfinished and rough.[101] (20.15)

This passage represents not only the first source on the unfinished that we know, but also the first statement that attributes the status of *unfinished* to a work of art that is sketched out, or rough, in some of its parts. This excerpt also indicates—particularly in the words "utmost refinement" (*politissima*) and "perfecting" (*perfecit*)—the official canon of finiteness that must be adopted by artists and accepted by viewers. As the words "finished job" suggest, the aesthetic requires presenting a polished surface.

Pliny, in the *Natural History* (*Naturalis Historia*), provided more information on the phenomenon of the unfinished in the visual arts. He adopted the term "imperfect" (*inperfecta*) to refer to unfinished, or incomplete, works of art (Preface. 26), whereas he used the term "perfect" (*perfecta*) to refer to complete artifacts (XXXV. XL. 145).[102] The examples of the unfinished that Pliny mentioned are now lost. Therefore, we do not know what the incomplete paintings he discussed looked like or in what degree of finiteness they were. An excerpt suggests that the works must have been abandoned at an early stage:

> It is also a very unusual and memorable fact that the last works of artists and their unfinished pictures such as the Iris of Aristides, the Tyndarus' Children of Nicomachus, the Medea of Timomachus and the Aphrodite of Apelles which we have mentioned, are more admired than those which they finished, because in them are seen the preliminary drawings left visible and the artists' actual thoughts, and in the midst of approval's beguilement we feel regret that the

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[101] Cicero, *Letter 20. Cicero to Lentulus Spinther*, p. 134: "nunc, ut Apelles Veneris caput et summa pectoris politissima arte perfecit, reliquam partem corporis incohatam reliquit, sic quidam homines in capite meo solum elaborarunt, reliquum corpus imperfectum ac rude reliquerunt". Translated in ibid., p. 135.

[102] Pliny, *Natural History*, I, p. 16; and ibid., (1952), IX, p. 366.

artist's hand while engaged in the work was removed by death.[103] (XXXV. XL. 145)

From Pliny's account, it emerges that unfinished works of art were more praised than finished ones, because they allowed the beholder to learn more about the techniques used, the process of the works' creation, and the origin of the artists' thoughts. For these reasons, we can assume that those paintings, the underlying drawings of which were evidently visible, were partly finished and probably similar to (for instance) the unfinished *Adoration of the Magi* (1481) by Leonardo da Vinci (1452–1519), where the preliminary drawings are still evident (fig. 18).[104] Significantly, whereas in Cicero the unfinished has a negative connotation, in Pliny it has a positive nuance because of the interesting information about the work of art that can be deduced through it.

Three ancient sculptures are revelatory of the kind of information that the unfinished may offer to the viewer. The first example is the *Kouros of Apollonas* (figs. 19–20), dating from Archaic period of ancient Greece, between the seventh and sixth centuries BC. The figure is roughly carved, though the body, head with beard, ears, and the beginning of the hair are approximately recognisable. The arms have been cut by the sculptor as rudimentary rectangles, and the shaping of the feet had been begun. The second sculpture is an unfinished bas-relief on a stone base (fig. 21), dating early first century BC. The scene shows the silhouette of two just begun figures, with very few details. This exemplifies the early stages adopted by an ancient artist: the first task was to outline the entire figures, adding details progressively in the following passages. The last example, a garland sarcophagus (fig. 22) probably datable to the late second or the third century, presents a singular situation: the front side is fully finished, the rear side is only sketched out, and both states of finiteness emerge in the short sides.[105] Considering one of the short sides, on the left is the (almost) finished version, on the right is the early stage of the carving process, both showing the

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[103] Ibid., IX, p. 366: "illud vero perquam rarum ac memoria dignum est, suprema opera artificum inperfectasque tabulas, sicut Irim Aristidis, Tyndaridas Nicomachi, Mediam Timomachi et quam diximus Venerem Apellis, in maiore admiratione esse quam perfecta, quippe in iis liniamenta reliqua ipsaeque cogitationes artificum spectantur, atque in lenocinio commendationis dolor est manus, cum id ageret, exstinctae". Translated in ibid., IX, p. 367.

[104] For Leonardo's *Adoration of the Magi*, see § 2.2.

[105] For more on this sarcophagus, see Will Wootton, Ben Russell and Peter Rockwell, "Stoneworking Techniques and Processes", in *The Art of Making in Antiquity: Stoneworking in the Roman World* (2013), pp. 1-35 (2). <http://www.artofmaking.ac.uk/content/essays/3-stoneworking-techniques-and-processes-w-wootton-b-russell-p-rockwell/> [accessed 14 April 2020].

sequences of tools employed. On the right, the basic geometric form of the garland was marked out into the flat surface and the surrounding area carved back to the background plane. The carver responsible for this sarcophagus employed a wide range of tools and structured his work in a highly methodical manner, roughing out the basic design with a tooth chisel before beginning on more detailed carving. The details were then finely shaped with a flat chisel. Further definition of the grapes was achieved with a drill, the marks of which can be seen on the left. The drill was employed after fine shaping of the forms to accentuate details of the relief and give it a certain depth.

In his *Natural History*, Pliny mentioned another relevant term related to the phenomenon of the unfinished. In the Preface, he informs us about the ancient practice of inscribing works of art that were not completed yet with a specific and provisional inscription: *faciebat*, meaning "worked on by…".[106] This inscription offered two important indications: (*i*) the prerogative enjoyed by the artist to tweak the painting if some meritorious criticism were to be offered, and (*ii*) the conviction that no work of art can really be considered finished:

> And so as not to seem a downright adversary of the Greeks, I should like to be accepted on the lines of those founders of painting and sculpture who, as you will find in these volumes, used to inscribe their finished works, even the masterpieces which we can never be tired of admiring, with a provisional title such as *Worked on by Apelles* or *Polyclitus*, as though art was always a thing in process and not completed, so that when faced by the vagaries of criticism the artist might have left him a line of retreat to indulgence, by implying that he intended, if not interrupted, to correct any defect noted.[107] (Preface. 26)

As Pliny suggests, the inscription *faciebat* can also be interpreted as an expression of modesty on the part of the artists who employed it, inasmuch as, with this inscription, they recognise their own fallibility: "Hence it is exceedingly modest of them to have inscribed all their works in a manner suggesting that they were their latest, and as though they had been snatched away from each of them by fate" (Preface. 27).[108]

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[106] Pliny, *Natural History*, I, p. 16.

[107] Ibid.: "Et ne in totum videar Graecos insectari, ex illis nos velim intellegi pingendi fingendique conditoribus quos in libellis his invenies absoluta opera, et illa quoque quae mirando non satiamur, pendenti titulo inscripsisse, ut *Apelles faciebat* aut *Polyclitus*, tamquam inchoata semper arte et inperfecta, ut contra indiciorum varietates superesset artifici regressus ad veniam, velut emendaturo quicquid desideraretur si non esset interceptus". Translated in ibid., p. 17.

[108] Ibid., p. 16: "Quare plenum verecundiae illud est quod omnia opera tamquam novissima inscripsere et tamquam singulis fato adempti". Translated in ibid., p. 17.

These passages open up the discussion on both the meaning of the unfinished and the problem of the finiteness of works of art, raising the following questions: How can we recognise the unfinished in a visual work of art? When can an artwork be said to be finished? Who is entitled to decide when a work is finished? What are the implications of the unfinished in the traditional canon of finiteness? and How do beholders respond to the unfinished? To answer these queries we need to expand our investigation of how the notion of the unfinished was employed, with its varying terminologies, in the Renaissance, when most of the topics addressed by Cicero and Pliny were further developed, starting with the so-called Plinian signature.

The Plinian signature was much used in the Renaissance. One of the most emblematic examples of its use is represented by Titian's *Annunciation* (fig. 23), dated 1559–1564 and commissioned by Antonio Cornovi for his chapel in the church of San Salvador in Venice. Titian interrupted his work on this painting for a while, as the inscription at the bottom, on the first step, suggests. As if it were carved, it reads, in the perfect tense, "*Titianus fecit fecit*" (Titian made it, made it). Reflectographic analysis revealed that this writing overlaps another one which reads, this time in the imperfect tense, "*Titianus faciebat*" (Titian was making), implying a different status for this painting (fig. 24).[109] Whereas the first sentence (*Titianus fecit fecit*), which refers to the actual state of the painting, indicates that the painting is complete, the second one (*Titianus faciebat*) suggested that, even though for the artist the work was finished, he was available "to correct any defect noted"; in other words, he was disposed to put in question his work's status as finished, according to the canon of finiteness commonly accepted.[110]

Angelo Poliziano (1454–1494) was one of the first in the Italian Renaissance to comment on artists' habit of indicating the level of finiteness in their works of art. In examining the Plinian signature on a pedestal, Poliziano states that it was

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[109] See Luisa Attardi, "Titian: The Annunciation", in *Titian*, ed. by Giovanni C. F. Villa (Cinisello Balsamo and Milan: Silvana, 2013), pp. 228-231; and Natalino Bonazza, "Annunciation", in *Late Titian and the Sensuality of Painting*, ed. by Sylvia Ferino-Pagden (Venice: Marsilio, 2008), pp. 257-259.

[110] Pliny, *Natural History*, I, p. 16: "velut emendaturo quicquid desideraretur". Translated in ibid., p. 17. On Pliny's comments on inscriptions, see Sarah Blake McHam, *Pliny and the Artistic Culture of the Italian Renaissance: The Legacy of the Natural History* (New Haven and London: Yale University Press, 2013), pp. 183-203, 346-350.

as if art were always something begun and unfinished: thus, in the face of changes in taste, the artist had recourse as he had indicated that he was ready to correct all the faults brought to his attention, if death did not interrupt him.[111]

What is interesting in this passage is that Poliziano interprets the Plinian signature as indicating the difficulty inherent in considering any work of art finished. The reasons for this difficulty may be (*i*) the artist's (human) lack of perfection; (*ii*) variation in the tastes of observers, at least some of whom may desire changes in the artwork; and (*iii*) variations in, or intolerance to, the (established) canon of finiteness.

But during the Renaissance the unfinished was not always praised, and theorists were scrupulous in advising artists to avoid it when not necessary. Leon Battista Alberti (1404–1472), for instance, in *On Painting* (*De pictura*), first published in 1435, warned artists to finish their works, and to do it at the right stage of the process.[112] He also introduced the term "over-polished" (*troppo pulito*) to refer to the results of over-working one's artistic projects; Alberti suggested that artists avoid this.[113] Furthermore, like Pliny, Alberti used specific words to name a complete work of art, such as "completed" (*compiuto*) and "perfect" (*perfetto*).[114] However, Alberti dealt with the phenomenon of the unfinished generally, neither mentioning any example of incompleteness nor explaining the different degrees of the unfinished. It is precisely in the equilibrium between the unfinished and the over-polished, I argue, that Alberti circumscribed, without actually describing it, the canon of finiteness for sculptures and paintings.

Leonardo da Vinci, in his *Treatise on Painting* (*Trattato della pittura*), echoed Alberti when warning artists not to over-work their paintings. In the chapter called "Precept around the design of the sketch stories and figures" (*Precetto intorno al disegno dello schizzare storie e figure*), Leonardo states that "the sketch of the stories has to be ready, and the execution of limbs does not have to be too much finished; be

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[111] Angelo Poliziano, *Angeli Politiani Miscellaneorum centuria prima* (Chiusi, Siena: Luì, 1994), p. 264: "tanquam incohata semper arte, et imperfecta, ut contra iudiciorum uarietates superesset artifici regressus ad ueniam, uelut emendaturo quicquid desideraretur, si non esset interceptus". Translated in Blake McHam, *Pliny and the Artistic Culture of the Italian Renaissance*, p. 185.

[112] Leon Battista Alberti, *Il nuovo De pictura di Leon Battista Alberti / The New De pictura of Leon Battista Alberti*, ed. by Rocco Sinisgalli (Rome: Kappa, 2006), p. 267.

[113] Ibid., pp. 268-269.

[114] Ibid., pp. 267-268.

happy only to the parts of those limbs, which then you can finish as you please".[115] Then, in the chapter entitled "Of incarnations and remote figures from the eye" (*Delle incarnazioni e figure remote dall'occhio*), he suggests that figures located far from the eye have to be painted with spots of colour, looking, as a result, "not finished" (*non terminate*) at a closer view.[116] From this we can deduce that, for Leonardo, an artist has to find a balance between the excessively unfinished and the over-worked; moreover, on some occasions, judicious use of the unfinished can help ensure the correct perception of figures.

Giorgio Vasari (1511–1574), in the chapter dedicated to sculpture in *The Lives of the Most Excellent Painters, Sculptors and Architects* (*Le vite de' più eccellenti pittori scultori e architettori*), dated 1550 and 1568, contrasts the term "drafts" (*bozze*) with the terms "finished" (*finito*) and "finiteness" (*finimento*), and advises artists not to finish sculptures intended for placement far from the beholder.[117] Therefore, we can assume that he judged the drafts as unfinished works of art; this is confirmed by the works that he considered incomplete, starting with Donatello's output. In this regard, Vasari compared the *Singing Gallery* (fig. 25) by Donatello (1386–1466), dated 1433–1438, with the *Singing Gallery* (fig. 26) by Luca della Robbia (c. 1400–1482), dated 1431–1438, both created for the Florentine Cathedral of Santa Maria del Fiore.[118] Vasari argues that Donatello conducted his work "almost entirely in drafts" and that the work was "not finished cleanly" (fig. 27)—as opposed to that of Della Robbia

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[115] Leonardo da Vinci, *Trattato della pittura*, ed. by Ettore Camesasca (Vicenza: Neri Pozza, 2000), p. 55: "Il bozzar delle storie sia pronto, e il membrificare non sia troppo finito; sta contento solamente a' siti di esse membra, le quali poi a bell'agio piacendoti potrai finire". Unless noted otherwise, subsequent translations are my own.

[116] Ibid., p. 241: "Devesi per lo pittore porre nelle figure e cose remote dall'occhio solamente le macchie, non terminate, ma di confusi termini".

[117] Giorgio Vasari, "Della scultura", in id., *Le vite de' più eccellenti pittori scultori e architettori: nelle redazioni del 1550 e 1568*, ed. by Rosanna Bettarini and Paola Barocchi, 6 vols (Florence: Sansoni, 1966), I, pp. 82-110 (84): "Debbono le figure, così di rilievo come dipinte, esser condotte più con il giudicio che con la mano, avendo a stare in altezza dove sia una gran distanza, perché la diligenza dell'ultimo finimento non si vede da lontano, ma si conosce bene la bella forma delle braccia e delle gambe et il buon giudicio nelle falde de' panni con poche pieghe, perché nella semplicità del poco si mostra l'acutezza dell'ingegno. E per questo le figure di marmo o di bronzo che vanno un poco alte vogliono essere traforate gagliarde, acciò che il marmo che è bianco et il bronzo che ha del nero piglino all'aria della oscurità, e per quella apparisca da lontano il lavoro esser finito e d'appresso si vegga lasciato in bozze". Translated in Vasari, *Vasari on Technique*, trans. by Louisa S. Maclehose, ed. by Gerard B. Brown (New York: Dover, 1960), p. 145.

[118] See Vasari, "Vita di Luca della Robbia", in id., *Le vite de' più eccellenti pittori scultori e architettori*, III, pp. 49-58 (51).

(fig. 28)—in order to create a better effect from a certain distance.[119] By contrast, Della Robbia's *Singing Gallery*, which stands out for its "smoothness" (*pulitezza*) and "finiteness" (*finimento*), does not appear in all its splendor to the beholder's eye—as Donatello's work does, inasmuch as it is "almost only sketched" (*abbozzata*).[120] Vasari's version of the canon of finiteness seems to be similar to the version outlined by Leonardo, who defined the appropriate level of finiteness in relation to the distance between the figures represented and the beholder's eyes.

A further contribution to the discussion on the unfinished in relation to the distance between works of art and observers derives from Michelangelo's biographer Ascanio Condivi (1525–1574), who, in his 1553 work *Life of Michelangelo Buonarroti* (*Vita di Michelangelo Buonarroti*), registered Michelangelo's admiration for Donatello's *David* (fig. 29) and, at the same time, his skepticism regarding its rough surface:

> What you see in the middle of the courtyard of the Signori palace is made by Donatello, excellent man in that art and much praised by Michelangelo, except in one thing, that he had no patience in polishing his works, so that, looking wonderful from a distance, at a closer gaze they lost their reputation.[121]

This passage confirms that the unfinished in the medium of sculpture was acceptable to the Renaissance beholder when it was justified by the distance of the work from the beholder's space. However, the witness of the Florentine sculptor and architect Tiberio Calcagni (1532–1565), a collaborator of Michelangelo's, contradicts Condivi's assertion. Calcagni stated that Michelangelo's comment on polishing was instead directed at Donatello's *Judith and Holofernes* (fig. 30), dated c. 1457–1464, which also presents an uneven surface but which was probably made for the small garden of Medici Palace. Moreover, Calcagni is more accurate, as having said, in

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[119] Ibid.: "per avere egli quell'opera condotta quasi tutta in bozze e non finita pulitamente, acciò che apparisse di lontano assai meglio, come fa, che quella di Luca". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, trans. by Gaston du C. de Vere, 10 vols (London: Macmillan and The Medici Society, 1912–1915), II, p. 121.

[120] Vasari, *Vita di Luca della Robbia*, p. 51: "se ben fatta con buon disegno e diligenza, ella fa nondimeno con la sua pulitezza e finimento che l'occhio per la lontananza la perde e non la scorge bene come si fa quella di Donato, quasi solamente abbozzata". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, II, p. 121.

[121] Ascanio Condivi, *Vita di Michelangelo Buonarroti*, ed. by Giovanni Nencioni (Florence: Studio per edizioni scelte, 1998), p. 22: "Quel che si vede nel mezzo della corte del palazzo de' Signori è di mano di Donatello, uomo in tal arte eccellente e molto da Michelangelo lodato, se non in una cosa, ch'egli non aveva pacienza in repulir le sue opere, di sorte che, riuscendo mirabili a vista lontana, da presso perdevono riputazione".

opposition to Condivi's view, that Michelangelo meant to say that "when sculptures are good they do not need so much polishing".[122]

Raffaello Borghini (1537–1588), in *The Rest* (*Il riposo*), published in 1584, following Leonardo's and Vasari's principles but without mentioning any example, suggests that figures depicted as far from the beholder must be left "sketched" (*abbozzate*) and, therefore, "unfinished" (*non finite*), because at that distance the details are not visible, as is the case in real life.[123] Also in Borghini, as in Leonardo and Vasari, the terms "sketched" and "unfinished" coincide, indicating that a draft is nothing other than an incomplete work of art. In emphasising the relationship between the figures and the space around them, it is evident that Borghini is concerned with problems linked to the mechanisms of vision, which is the same concern shown by Leonardo and Vasari. Borghini's view on the unfinished is a further confirmation that Italian Renaissance artists and theorists were formulating a consistent canon of finiteness, characterised by equilibrium between the unfinished and the over-polished.

Another topic related to the unfinished is the interruption of an artwork as a consequence of an irreparable mistake or a dissatisfaction. Considering Leonardo's production, for example, Sebastiano Serlio (1475–1554), in *The Second Book of Perspective* (*Il Secondo Libro di Prospettiva*), dated c. 1551, states that most of the time Leonardo did not bring his works to "perfection" (*perfettione*) because of his dissatisfaction in himself: "Leonardo Vinci was never satisfied about anything he produced, and he concluded very few works, and he often said that the cause of this was that his hand could not reach his intellect".[124] As previously seen, "perfection" is

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[122] For Tiberio Calcagni's manuscript note, see Condivi, *Vita di Michelangelo Buonarroti*, XXI, *postilla* 9: "quando son buone non ci occorre tanti pulimenti". For the documentation regarding the placement of Donatello's *Judith and Holofernes*, see John Pope-Hennessy, *Donatello Sculptor* (New York: Abbeville Press, 1993), pp. 247: fn. 19, 280.

[123] Raffaello Borghini, *Il riposo,* ed. by Mario Rosci, 2 vols (Milan: Labor, 1967), I, pp. 178-179: "Perciò che le figure, che appariscono di forma più piccole che l'altre, ciò adiviene perché esse sono lontane dall'occhio, e per conseguente fra esse, & il riguardante è molta aria, la quale impedisce il discernere le particelle degli obietti. Perciò bisogna che il pittore faccia le figure piccole solamente abbozzate, e non finite, perché altramente si contrafarebbe alla natura maestra dell'arte".

[124] Sebastiano Serlio, *Il secondo libro di prospettiva* (Venice: Francesco Senese and Zuane Krugher Alemanno, 1566), p. 27r: "Leonardo Vinci non si contentava mai di cosa ch'ei facesse, et pochissime opere condusse a perfettione, et diceva sovente la causa esser questa: che la sua mano non poteva giungere all'intelletto".

synonymous with "finish". Serlio's ascertainment is confirmed by the *Book of Antonio Billi* (*Libro di Antonio Billi*), dated 1516–1530, which explains the reasons for Leonardo's frequent interruptions, namely his dissatisfaction:

> He surpassed all others in drawing and made beautiful inventions, but he did not colour many things, because nothing however beautiful ever satisfied him; that is why there are few things by him, because the awareness of his mistakes did not let him produce very much.[125]

Serlio's and Billi's passages point out that there are some factors, inherent in the process of creation, that can bring a work of art to such a state that the artist is no longer able to carry it on.

If Leonardo abandoned some of his works incomplete for reasons related to his dissatisfaction, Michelangelo abandoned many of his paintings and sculptures in the middle of their creation for reasons related to an overlapping of commissions (there is no evidence that he ever did so for aesthetic reasons). In fact, as Vasari said, Michelangelo left the majority of his works "imperfect" (*imperfette*), so that few of them are "finished" (*finite*).[126] For instance, describing Michelangelo's *St Matthew* (fig. 31), a statue dated 1506 and carved for Santa Maria del Fiore, Vasari adopts the adjective "sketched" (*abbozzata*) to refer to its unfinished state, saying that "this statue teaches sculptors in what manner figures can be carved out of marble without their coming out misshapen".[127]

Benedetto Varchi (1503–1565), on 14 July 1564, delivered a funeral oration for Michelangelo in the church of San Lorenzo in Florence. The text was published later the same year, offering another contribution to the debate on the unfinished in Michelangelo's output. Varchi examines, in addition to the "not finished" (*non*

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[125] Antonio Billi, *Il libro di Antonio Billi*, ed. by Karl Frey (Berlin: Grote'sche Verlagsbuchhandlung, 1892), pp. 51-52: "Costui in disegno avanzò gli altri et ebbe inventioni bellissime, ma non colorí molte cose, perché mai in niente anchor che belle satisfecie a se medesimo; et però ci sono poche cose di suo, che il suo tanto conosciere gli errori non lo lasciò fare".

[126] Vasari, "Vita di Michelagnolo Buonarruoti Fiorentino", in id., *Le vite de' più eccellenti pittori scultori e architettori*, VI, pp. 3-141 (92): "delle sue statue se ne vede poche finite nella sua virilità, che le finite affatto sono state condotte da lui nella gioventù…l'altre, dico sono [re]state imperfette, e son molte maggiormente". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, IX, p. 83.

[127] Vasari, *Vita di Michelagnolo Buonarruoti Fiorentino*, p. 22: "la quale statua cosí abbozzata mostra la sua perfezzione et insegna agli scultori in che maniera si cavano le figure de' marmi senza che venghino storpiate". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, IX, p. 18. I will return to Michelangelo's *St Matthew* in Chapter 5.

fornito) *St Matthew*, Michelangelo's two *Tondi*, that is, the *Taddei Tondo* (fig. 32) and the *Pitti Tondo* (fig. 33), both begun between 1504 and 1506 circa and carved for Bartolomeo Pitti and presumably Taddeo Taddei, respectively.[128] Varchi considers these bas-reliefs "sketched" (*abbozzati*) and, therefore, unfinished.[129] In fact, the roughed out parts of these bas-reliefs show that both were carved with a chisel starting from the Madonna and child, leaving the background, and in the case of the *Pitti Tondo* also St John, indefinite. Michelangelo may have abandoned the two *Tondi* for his departure to Rome, in 1505, to work for Pope Julius II. In the case of the *Taddei Tondo*, a further reason for its interruption could be damage created by the chiseling of a previous artist, which became more apparent after the work was well advanced.[130]

The fact that artists and theorists of the time described, in one way or another, all these works of art as unfinished shows that the canon of finiteness was very clear: completed figures, in some cases with a polished surface (when situated close to the viewers), in others with a slightly rough surface (when placed far from the viewer), but never over-polished and never too roughly sketched. This is confirmed by the artistic debate that took place in another important Renaissance city: Venice.

In the second part of the sixteenth century, there was a group of Venetian artists who intentionally left a good number of their paintings unfinished, as an aesthetic choice. For example, Titian and Tintoretto executed many of their paintings in a freer way than the Florentine masters, with visible brushstrokes. Further, compositional adjustments (*pentimenti*) are often seen in their paintings, creating, most of the time,

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[128] On Michelangelo's *Pitti Tondo*, see Frank Zöllner, "Catalogue of Sculptures", in *Michelangelo: Complete Works,* ed. by Frank Zöllner, Christof Thoenes and Thomas Pöpper (Cologne: Taschen, 2007), pp. 366-403. On Michelangelo's *Taddei Tondo*, see Michael Hirst, "The Marble for Michelangelo's *Taddei Tondo*", *Burlington Magazine*, 1229 (2005), pp. 548-549.

[129] Benedetto Varchi, *Orazione funerale di Messer Benedetto Varchi fatta, e recitata da lui pubblicamente nell'essequie di Michelagnolo Buonarroti in Firenze nella chiesa di San Lorenzo,* ed. by Charles Davis (Florence: Giunti, 1563), p. 28: "E per dir prima de' marmi, molte, e diverse statue si ritruovano di suo in molti, e diversi luoghi: come…qui in Firenze un san Matteo Appostolo, il quale è nell'opera di Santa Maria del Fiore: e se bene egli non è fornito; gli schizzi di Michelagnolo nella Pittura, e le bozze nella Scultura mostravavano, e mostrano la profondità, ed eccellenza dell'intelletto, e ingegno suo; e maggiore stima si faceva di loro, che dell'Altrui opere, quantunque perfette. Due tondi similmente abbozzati; uno fatto à Taddeo Taddei; il quale è nella casa degli Heredi, e Discendenti suoi; e uno fatto à Bartolommeo Pitti, il quale (per don Miniato di quella famiglia, buono, e virtuoso Monaco di Monte Uliveto lo donò à Luigi) è nella casa di M. Piero Guicciardini, suo Nipote".

[130] On the technical analysis of the *Taddei Tondo*, see Hirst, *The Marble for Michelangelo's* Taddei Tondo.

sketchy images. In this sense, the *Carta del navegar pitoresco* (1660) by Marco Boschini (1613–1678), which relies on the testimony of the Venetian painter Palma il Giovane (1548/50–1628), reveals that Titian, late in his life, after having sketched out his main ideas with large brushstrokes, would complete his paintings using his fingers:

> But the condiment of the finishing touches was to combine from time to time with gashes made with fingers the ends of the lights, coming closer to the halftones, and combining a shade with the other; other times, with a pure scratch made with fingers he placed a stroke of dark in some corner, to reinforce it, as well as some reddish scratch…in this way he perfected his animated figures. Palma attested to me that, for truth, during the finishing touches he painted more with his fingers than with brushes.[131]

This passage offers a contemporary insight into the artistic technique used by Titian in his later paintings, emphasising an approach that is far from being unwanted: "I see a poultice, a contempt of brush", added Boschini.[132] Thus, Titian's and Tintoretto's sketchy paintings (which they considered finished, as evidenced by the fact that they delivered some of them), challenged the canon of finiteness that Florence was consolidating. One episode in particular may illustrate this assumption.

The episode in question concerns Titian's portrait of Pietro Aretino (1492–1556), who commissioned the painting in 1545. Once received, Aretino disliked the portrait (fig. 34) because it was realised with large and visible brushworks, particularly in the rendering of the light areas and the folds of his clothes. Upon delivery, Aretino sent the portrait from Venice to the Duke Cosimo I de' Medici in Florence, in October 1545, along with a letter reading, in part: "[I]f I had given him more money, the drapes would have been truly shining, soft and rigid like satin, velvet and brocade".[133] Between these lines, Aretino's disappointment with his portrait is evident. In another letter, which he wrote in the same month, addressed this time to Titian, he clarifies the

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[131] Marco Boschini, *Carta del navegar pitoresco*, ed. by Anna Pallucchini (Venice: Istituto per la collaborazione culturale, 1966), p. 712: "Ma il condimento de gli ultimi ritocchi era andar di quando in quando unendo con sfregazzi delle dita negli estremi de' chiari, avicinandosi alle meze tinte, ed unendo una tinta con l'altra; altre volte, con un striscio delle dita pure poneva un colpo d'oscuro in qualche angolo, per rinforzarlo, oltre qualche striscio di rossetto…e così andava a riducendo a perfezione le sue animate figure. Ed il Palma mi attestava, per verità, che nei finimenti dipingeva più con le dita che co' pennelli".

[132] Ibid., p. 327: "Vedo un impasto, un sprezzo de penelo".

[133] Pietro Aretino, *Lettere sull'arte di Pietro Aretino*, ed. by Ettore Camesasca, 3 vols (Milan: Edizioni del Milione, 1957–1960), II, pp. 107-108 (108): "se più fussero stati gli scudi che gliene ho conti, in vero i drappi sarieno lucidi, morbidi e rigidi come il da senno raso, il velluto e il broccato".

reason for his disillusionment: "[M]y portrait is more sketched than finished".[134] He judged the painting unfinished because it seemed to him like a sketch. It is worth noting that, once again, the terms "sketched" and "unfinished" coincide. But why was Aretino so dissatisfied with his portrait? Put differently, why did he consider it unfinished? The reason may be connected to the fact that he was a Tuscan Renaissance writer linked to the Medici family, with an aesthetic taste shaped by the style of art favored by that family. At that time, the Medici aesthetic was epitomised by (though not limited to) Bronzino's highly finished artworks (fig. 35). For this reason, Aretino could not, at least at first sight, appreciate, or accept as finished, a painting made in the Venetian "old-age style", as the last productions by Titian have recently been called.[135]

In this matter, Vasari echoed Aretino, saying that Titian sometimes left the "drafts" (*bozze*) for "finished" (*finite*) works, resulting in a work so "roughed" (*sgrossate*) "that you see the brushstrokes made by chance and pride, rather than being well studied and made with common sense".[136] From Vasari's harsh criticism of the sketchy style of Titian's painting, a question arises: why was the great admirer of Donatello's, Leonardo's and Michelangelo's incomplete works, and also the person who more than others encouraged the use of the unfinished in certain circumstances, so averse to Titian's use of the unfinished? One possible answer is that when the unfinished was employed intentionally to correct the visual perception, or represented an unwanted interruption that yielded pedagogical value, it was acceptable to Vasari. But when it became an aesthetic choice, as in Venice, without a particular (perceptual or pedagogical) justification, for him it represented an attack on the Florentine canon of finiteness that he helped to shape. In fact, Florentine artistic taste was perpetuated in Vasari's *Lives of the Most Eminent Painters, Sculptors and Architects*, in which he stressed the supremacy of the Florentine and ancient Roman artistic traditions because

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[134] Titian, *Le Lettere*, ed. by Clemente Gandini (Pieve di Cadore: Magnifica Comunità di Cadore, 1977), p. 81: "il mio ritratto più tosto abbozzato che fornito".

[135] See David Bomford, "Old-Age Style and the *Non Finito*", in *Unfinished*, pp. 48-55, 265-266.

[136] Vasari, "Vita di Battista Franco", in id., *Le vite de' più eccellenti pittori scultori e architettori*, V, pp. 459-473 (468-469): "Ha costui alcuna volta lasciato le bozze per finite, tanto a fatica sgrossate, che si veggiono i colpi de' pennegli fatti dal caso e dalla fierezza, più tosto che dal disegno e dal giudizio".

these were grounded in drawing.[137] Moreover, Vasari criticised Venetian artists for their habit of working directly on canvas, without the disciplined planning required by drawing.[138] This may be the reason why the Medici court never requested any paintings from Titian, inasmuch as his mode of execution increasingly emphasised the brushstroke.[139] I would argue that Aretino's and Vasari's negative views of Titian's "unfinished" painting style have to do with the meaning of Titian's choice, namely, to undermine the traditional canon of finiteness. In this, Titian was supported by Lodovico Dolce (c. 1508–1568), who, in *Dialogo della pittura intitolato l'Aretino* (1557), states, "We must above all escape too much diligence, that in all things harms".[140]

From this divergence of opinions emerges the discrepancy between the Florentine concept of finiteness and the Venetian, giving shape to two different canons of finiteness. The Roman author Francesco Sansovino (1521–1586) expressed the same concern raised by Aretino and Vasari regarding the unfinished. But this time Sansovino refers to Jacopo Tintoretto (1519–1594), more precisely to the work titled *Doge Alvise Mocenigo Presented to the Redeemer* (fig. 36), dated c. 1577. It is an unfinished draft for a painting—never begun because of the death of the patron—commissioned by Doge Alvise Mocenigo (1507–1577) for the Sala del Collegio in the Doge's Palace, in Venice. The painting shows a portico overlooking San Marco square, with the Doge's Palace on the left. At the center of the scene is Alvise Mocenigo, who is kneeling on the steps; on the left Christ is floating, surrounded by a group of angels (sketched in silhouette with white brushwork); and on the right there are the members of the Mocenigo family. In a large brown patch in the foreground is the underpainting for a lion. But the figures that capture our attention, because they are highly unfinished, are in the background, emerging from water. They are the brothers of Alvise, Giovanni and Niccolò Mocenigo. Referring to this level of

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[137] Vasari, "Dedica", in id., *Le vite de' più eccellenti pittori scultori e architettori*, I, pp. 1-5.

[138] Vasari, "Descrizione dell'opere di Tiziano da Cador", in id., *Le vite de' più eccellenti pittori scultori e architettori*, VI, pp. 155-174 (155-156).

[139] On the Florentine's artistic taste of the time, see Alison Wright and Eckart Marchand (eds.), *With and Without the Medici: Studies in Tuscan Art and Patronage* (Aldershot: Ashgate, 1998).

[140] Lodovico Dolce, *Dialogo della pittura intitolato l'Aretino,* in *Trattati d'arte del Cinquecento: fra manierismo e Controriforma*, ed. by Paola Barocchi, 3 vols (Bari: Laterza, 1960–1962), I, pp. 141-206 (185): "Bisogna sopra tutto fuggire la troppa diligenza, che in tutte le cose nuoce".

unfinishedness, Sansovino, in the *Dialogue of all the Notable and Beautiful Things that are in Venice* (*Dialogo di tutte le cose notabili e belle che sono in Venetia*), published in 1556, states:

> I do not want to disregard Iacomo Tintorello, who is all spirit, and all readiness… people desire from him more diligence, for the rest he is excellent. S[tranger]: You say the truth: I have considered his painting too: it does not seem finished, so I believe it stems from his excessive rapidity.[141]

Even though the protagonists of Sansovino's dialogue were able to recognise Tintoretto's skills, they did not appreciate his sketchy style because they associated it with the unfinished. In this sense, Sansovino provided a (negative) definition of the unfinished, that is, a work realised with rapidity.

A rapid method of executing paintings was also in use in antiquity, as we know from Pliny, who described the activity of the painter Pausias of Sicyon, who was able "to give his work also the reputation of speed he finished a picture in a single day" (XXXV, 124).[142] This passage closely recalls Tintoretto's fast working pace, confirmed by Aretino, who had already criticised Titian for his sketchy portrait. Aretino even suggested that Tintoretto should slow down in a letter to the painter dated April 1548:

> And blessed is your name, if you would substitute the rapidity of the working with the patience of doing. Though the years will help you in this little by little; for they, and not others, are quite sufficient to restrain the course of carelessness, which is so prevalent in the willing and quick youth.[143]

Giovanni Battista Armenini (1530–1609), in *Of the True Precepts of Painting* (*De' veri precetti della pittura*), published in Ravenna in 1587, is in line with what Sansovino said in the same year. He points out that, most of the time, Tintoretto did

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[141] Francesco Sansovino, *Dialogo di tutte le cose notabili e belle che sono in Venetia* (Venice: Tipografia Emiliana, 1861), pp. 13-14: "Ne vi voglio lasciare a dietro Iacomo Tintorello, il quale è tutto spirito, e tutto prontezza…si desidera in lui più diligenza, che del resto è eccellente. F[orestiero]: Voi dite il vero: anch'io ho considerato il suo quadro: non pare finito, perciò credo che questo nasca dalla sua molta prestezza".

[142] Pliny, *Natural History*, IX, p. 352: "daturus ei celeritatis famam absolvit uno die tabellam quae vocata est hemeresios". Translated in ibid., p. 353.

[143] Aretino, *Lettere sull'arte*, II, pp. 204-205 (205): "E beato il nome vostro, se reduceste la prestezza del fatto in la pazienza del fare. Benché a poco a poco a ciò provederanno gli anni; conciosia ch'essi, e non altri, sono bastanti a raffrenare il corso de la trascuratezza, di che tanto si prevale la gioventù volenterosa e veloce".

not draw before painting, leaving the "drafts" (*bozze*) for "finished" (*finite*) works.[144] In this way, the statements of Aretino, Vasari, Sansovino, and Armenini— significantly, none of them are from Veneto—together show their resistance to any attempt to challenge the commonly accepted canon of finiteness: the Florentine one. In this regard, the Venetian debate on the unfinished reveals the emergence of two opposite canons of finiteness in the sixteenth century, one that prefers a smoother surface, and another that conceives the sketchy manner as constitutive of an original style.

In sum, the authors who contributed significantly to the recognition and analysis of the phenomenon of the unfinished from classical antiquity to the Italian Renaissance—and who developed or reacted to the now-traditional canon of finiteness—were nineteen in number: Cicero, Pliny the Elder, Leon Battista Alberti, Leonardo da Vinci, Michelangelo Buonarroti, Ascanio Condivi, Tiberio Calcagni, Angelo Poliziano, Sebastiano Serlio, Pietro Aretino, Benedetto Varchi, Giorgio Vasari, the author of the Book of Antonio Billi, Lodovico Dolce, Marco Boschini, Palma il Giovane, Francesco Sansovino, Giovanni Battista Armenini, and Raffaello Borghini. As this list makes evident, this discussion spans centuries and involves some of the greatest writers and artists in human history. The principal artists about which these luminaries debated are eleven, spanning from the classical Greek period to the Italian Renaissance: Apelles, Aristides, Nicomachus, Timomachus, Pausias of Sicyon, Donatello, Luca della Robbia, Leonardo da Vinci, Michelangelo Buonarroti, Titian, and Jacopo Tintoretto. However, this does not mean that they were the only artists in these periods who left part of their production unfinished, either as a deliberate choice or due to an unforeseen event.

The terminology that the protagonists of this debate adopted to refer to the phenomenon of the unfinished in the visual arts has a core of thirteen words, both in Latin and in vernacular: *incohatus* (only begun, unfinished), *imperfectus* (imperfect, unfinished), *rudis* (unwrought, unformed, rough, raw), *faciebat* (worked on, was

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[144] Giovanni Battista Armenini, *De' veri precetti della pittura* (Ravenna: Francesco Tebaldini, 1587), p. 116: "Costui ha fatto più volte senza i dissegni opere molto importanti lasciando le bozze per finite, e tanto a fatica sgrossate, che si veggono i colpi del pennello fatto dall'impeto, e dalla fierezza di lui, ne perciò sono poi da essere troppo considerate a minuto".

making), *non perfetto* (not perfect, imperfect, unfinished), *non finito* (not finished, unfinished), *non finita pulitamente* (not polished, unfinished), *non terminato* (not terminated, not finished, not complete, unfinished), *bozza* (draft), *abbozzato* (sketched out), *imperfetto* (imperfect, unfinished), *non fornito* (not finished, unfinished), and *sgrossato* (roughed). Though many of them are synonyms and refer to works of art at any stage of realisation, others represent specific degrees of unfinishedness. For instance, the word *incohatus* mainly suits for works of art on which efforts have only just begun. On the contrary, words such as *rudis* or *non finita pulitamente* may primarily refer to almost finished statues, the surface of which has not been polished. The great variety of this terminology, adopted in different centuries and contexts, mirrors the complexity of this phenomenon, its contradictions, and different morphologies. It also suggests the variety of implications the phenomenon of the unfinished has had on the definition(s) of the canon(s) of finiteness. The systematic survey undertaken here represents the base from which I will conduct an investigation into the polarisation between the visible (what is finished) and the invisible (what is not) and the responses it may arouse in the viewer.

3 To Finish, or Not to Finish?

Another subject of Renaissance reflection on the unfinished was whether work left unfinished due to external interruption ought to be completed by the artist's colleagues. Two options were available, and which was chosen depended upon the circumstances surrounding the interruption: (*i*) it could be preserved, though incomplete, or (*ii*) it could be completed by the hand of another artist, at the cost of losing its original authenticity. It is also in the substance of this debate that the canon of finiteness, as I call it, is anchored.

Paolo Pino (active 1534–1565), for instance, in *Dialogue of Painting* (1548), suggested following the first option, that is, keeping the work unfinished as it is. He based his argument on a story about Apelles narrated by Pliny (XXXV, 92):

> Apelles...began a Venus, and reached by the cruel death, he left the figure imperfect, nor ever was found a painter who dared to finish it, and so imperfect it was for many years preserved by the community (as a marvelous thing).[145]

In this passage, Pino emphasises the fact that Apelles was so renowned during his time that no artist attempted to finish his painting, probably because the intervention of another artist would have meant losing the originality of Apelles' mastery. It is notable that Pino also mentions the second option, namely, the possibility of a second artist intervening to finish a commission interrupted by the original artist's death.

This was the solution sometimes pursued both in the Middle Ages and in the Renaissance, particularly in the situations where the canon of finiteness required a polished surface for both paintings and sculptures. An example of an artwork completed after a period of interruption is the fresco cycle of the Brancacci Chapel in Florence (fig. 37), which was begun by Masolino and Masaccio between 1423 and 1428 and was completed by Filippino Lippi in the early 1480s. In the gap between the two periods of work, large portions of the walls were blank, indicating the unfinished status of the frescoes.[146] Another, similar case of interruption is the *Pistoia Santa Trinità Altarpiece* (fig. 38), which was begun by Pesellino in 1455 and finished by Filippo Lippi and his workshop in 1460. In this case, the unfinished status of the artwork was evident in the different levels of finiteness present on the surface, including blank spaces.[147] For these reasons, it was considered necessary to establish a uniform canon of finiteness for the entire surface of the two works. The fact that they were left incomplete due to lack of funding is probably a further reason why their unfinished status was not appreciated, prompting a request for the intervention, years later, of other artists.[148]

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[145] Paolo Pino, *Dialogo di pittura*, ed. by Rodolfo and Anna Pallucchini (Venice: Guarnati, 1946), pp. 94-95: "Apelle…cominciò una Venere, et sopragionto dalla crudel morte, lasciò la figura imperfetta, né mai fu trovato pittore, che ardisse di finirla, et così imperfetta fu dal comune molti anni (come cosa maravigliosa) conservata"; Pliny, *Natural History*, IX, p. 328.

[146] See Paul Joannides, *Masaccio and Masolino: A Complete Catalogue* (London and New York: Phaidon, 1993), pp. 313-349.

[147] See Dillian Gordon (ed.), *The Fifteenth Century. Italian Paintings*, 7 vols (London: National Gallery Company, 2003), I, pp. 260-287.

[148] See Hout, "The Unfinished and the Eye of the Beholder", in *Unfinished*, pp. 56-61; and Hout, *The Unfinished Painting*, p. 10.

The last painting of Titian, whose death did not allow him to finish it, had the same destiny as these two works. This is the *Pietà* (fig. 39), dated 1575–1576.[149] In 1648, Carlo Ridolfi informs us that the painting was created by Titian for the Cappella del Crocifisso of Santa Maria dei Frari, with the aim of having it placed over his own tomb. However, "he did not complete it, but after his death it came in the Palma's hands, who finished it by adding some little Angels and this humble inscription: 'Palma reverently completed the work that Titian began, and dedicated it to God'" (fig. 40).[150] In 1664, Marco Boschini recorded the intervention of Jacopo Palma il Giovane (1548/50–1628)—who was associated with Titian and knew how to imitate his art—on this painting, adding that "the chiaroscuros are all by Titian, but the other figures are retouched and painted in different parts by Palma".[151] These statements indicate both that the *Pietà* was considered unfinished at the time of Titian's death and that its new owner wanted to have it completed, even though this required altering Titian's original work. As scholars pointed out, Palma may have painted the flying angel at the top right, the other angel at the bottom left with the vase of perfumes of Mary Magdalene, and the lamps on the tympanum, which all appear more "finished" than the other figures.[152] Therefore, Palma, in completing the work in some of its parts, precisely those which now seem smoother than the others, modified Titian's style, which, in that period, consisted in a sketchy effect.[153] As a consequence, by applying the traditional canon of finiteness on a sketchy painting, the extra intervention caused a polarity in the painting between a sketchy manner and a more finished surface.

The analysis so far undertaken shows that the debate on the unfinished in the period framed in this research contributed to the identification of different level of finiteness: "finished", "unfinished" (with its different degrees of unfinishedness), and

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[149] See Giovanna Nepi Scirè, "La Pietà", in *Tiziano*, ed. by Francesco Valcanover et al. (Venice: Marsilio, 1990), pp. 373-375; Harold E. Wethey, *The Paintings of Titian: Complete Edition* (London: Phaidon, 1969), I, pp. 122-123.

[150] Carlo Ridolfi, *Le maraviglie dell'arte: ovvero le vite degli illustri pittori veneti e dello stato descritte dal cav. Carlo Ridolfi* (Padua: Cartallier, 1835), I, p. 269.

[151] Marco Boschini, *Le ricche minere della pittura veneziana. Compendiosa informazione di Marco Boschini, non solo delle pitture publiche di Venezia, ma dell'isole ancora circonvicine* (Venice: Francesco Nicolini, 1674), p. 93.

[152] See Augusto Gentili, *Tiziano* (Milan: 24 ore cultura, 2012), pp. 382-386.

[153] See Sohm, *The Artist Grows Old*; and Bomford, *Old-Age Style and the* Non Finito, p. 50.

"over-finished". This very fruitful debate provides, first, a definition, or definitions, of the unfinished, pointing to its usefulness in different ambits—from pedagogy to perception. Second, the debate contributed to the formation of two specific and conflicting canons of finiteness: one that privileged a (more or less) smooth surface, both in paintings and in sculptures, and the other, particularly favored in Venice, that valued a more free (or sketchy) approach to the canvas and to materials proper to sculpture.

CHAPTER TWO

Types of the Unfinished

This chapter investigates the aesthetic features of the unfinished and is divided into three sections. The first section compares and contrasts the visual appearances of the unfinished with other states of works of art—such as the fragment, damage, failure, and the so-called hidden image—the formal appearances of which are similar, but not equal, to the unfinished. In fact, the causes that determine the unfinished status of a work of art are different from those that led to these other states.

The second section analyses two notions: "genetic completion" and "aesthetic completion", which were proposed by Paisley Livingston in reference to specific cases of unfinished works of art. This idea seems to solve part of the problem of the discordance that arises when a work of art is considered finished by its author but not by some viewers, or vice versa.

The last section of this chapter proposes a classification of unfinished works of art in four categories: "almost finished", "partly finished", "sketched", and "part missing", with explanatory examples. This subdivision structures the neuroaesthetic investigation of responses to the unfinished, which is undertaken in chapters five and six.

1 The States of Works of Art: A Clarification

An analysis of the main terms related to various states of works of art may help to better address the study of the responses to unfinished pieces. In fact, there is a series of states that may appear unfinished, at least in their formal features, but that result from conditions that are instead very different from those of the unfinished. Arriving at a distinction, a number of main states that constitute the formal appearances of

works of art can be identified, such as finiteness—in which the "finished", the "unfinished", and the "over-finished" are its three sub-categories; fragment; damage —caused by either natural or human interventions; failure, or *pentimento*; and the so-called hidden figure or image.

Whereas this research deals with the first state—that is, finiteness and its three sub-categories—the other four conditions are outlined here for reasons of clarity. For instance, the formal appearance of a fragment can be confused with that of an unfinished work of art for its peculiarity to be only one part of a larger piece. An example of this confusion is evident in Darren Hudson Hick's *When is a Work of Art Finished?*, where he argues that "a fragment may result when an artist abandons a work without finishing it, when the creation of a work is externally interrupted, or when the rest of a work is lost or destroyed and the fragment is what remains".[154] A similar misperception results from Paisley Livingston's analysis of the concept of "fragment". The author distinguishes the phenomenon of the fragment in "three different senses", writing:

> The first refers to what is left behind when the action of creating a work is externally interrupted; the second is the item left behind when an artist abandons a work as incomplete, as opposed to the happier case where the decision to stop working is motivated by the decision that the result is a completed work; a third kind of fragment is the romantic fragment, which satisfies the intentionalist condition of genetic completion, while imitating or depicting one of several other sorts of fragments. Most typically, the romantic fragment is an imitation of a kind of fragment that has not yet been mentioned, and which can be called the fragment proper. Speaking quickly, we can say that some text or structure is a fragment proper when the item is correctly taken as a part of some previously existing yet lost whole work, that is, a work that was once genetically complete.[155]

As these two passages make clear, Hick and Livingston consider the fragment to be the result of three possible causes: (*i*) when the creation of a work of art is interrupted; (*ii*) when an artist abandons his or her work without finishing it; or (*iii*) when a work is divided into two or more pieces. However, these causes are too distinct to belong to the same category. A couple of examples may clarify this issue.

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[154] Darren Hudson Hick, "When is a Work of Art Finished?", *The Journal of Aesthetics and Art Criticism*, 66 (2008), pp. 67-76 (68).

[155] Paisley Livingston, *Art and Intention: A Philosophical Study* (Oxford: Clarendon, 2005), p. 59.

For instance, *Man on a Ladder* (fig. 41), executed by Luca Signorelli (1450–1523) in 1504–1505, shows two cut figures, one in the foreground (cut horizontally, with only half the face visible) and the other one in the background (riding a horse and cut vertically), which may suggest a sort of incompleteness. However, since the panel itself does not present any possibility of expansion and what is visible in the painting is clearly completed, there is no reason to consider this painting the result of an interruption. On the contrary, it should be considered a fragment of a larger altarpiece representing a lamentation over the dead Christ. In sculpture, clear examples of fragments are the surviving marble portions of the *Colossus of Costantine* (c. 312–315), that is, the right arm (with elbow), the head, the right kneecap, the right hand, the left shin, the right foot, the left kneecap, and the left foot (fig. 42).

Consequently, Hick's and Livingston's statements cannot be accepted in their entirety, but only in certain aspects. A more precise definition of fragment can be drawn from what Livingston called "fragment proper".[156] In this sense, we can define a fragment as a piece derived from a larger work of art, resulting from a cut—effectuated after its creation and without the direct intervention or consent of its author—but not as an unfinished work of art. This is because a fragment is not necessarily an unfinished work of art, as it can also be a finished portion of a larger finished work, or an unfinished portion of a larger unfinished work, and so on. In other words, what should be clear is that the characteristics of a fragment do not relate to the finiteness of a work of art.

Another surface state that closely resembles an unfinished work of art is damage. Though the appearances of these two states may be similar, the motivations that led to their respective conditions are very different. Whereas the unfinished is the result of an interruption by the artist, either voluntary or not, before the work has been finished, damage is the consequence of destruction, total or partial, due to an external intervention from the process of creation, usually by someone different from the author or due to environmental causes. Furthermore, and most importantly, the former allows the beholder to see the process of creation, the latter does not. An ancient

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[156] Ibid.

sculpture may clarify this dichotomy. Consider the ancient Roman bust of Socrates (figs. 43–44), at the same time unfinished and damaged, evidenced by the two very different surfaces that it features: (*i*) a regular weave of intertwined lines executed with a tooth chisel and small holes regularly arranged executed with a hand drill (meant to bring the drawing to scale on the marble block), indicating that the sculpture was abandoned in the middle of creation; and (*ii*) an irregular and formless surface between the nose and beard, suggesting that marble chips were (probably) accidentally detached afterwards.

After this clarification, it is worth distinguishing two different kinds of damage: that due to environmental causes and the other by human intervention. The first case can be the result of one or more of the following factors: wear and tear, fire, leaks and floods, pests, atmospheric pollutants, radiation, incorrect temperatures, incorrect humidity, custodial neglect, etc. This first case is exemplified by the *Salvator Mundi* (fig. 45), dated c. 1505, by Albrecht Dürer (1471–1528). The painting lacks colour in some surface areas, particularly the head and hands.[157] The lack of colour in this painting, which shows the underdrawing, is due to both an artist interruption—it was indeed listed in a 1573 inventory as "not quite finished" (*nit gar ausgemacht [hat]*)— and a damage and abrasion, which caused the fall of the pictorial layer raised.[158] The fact that the condition of this painting is not only the consequence of an interruption but also of damage, it is clear in the irregularity of the missing parts, resulting in a series of spots of colour interspersed by the thin lead white primer. In sculpture, this type of damage can be reviewed in the numerous mutilated statues that have come down to us from antiquity, such as the *Belvedere Torso* (fig. 46). The second case of damage is instead the consequence of one of the various forms of assault against images, known as censorship or iconoclasm, which may include acts of vandalism, pathological or psychotic violence, destruction or mutilation for reasons of principle (e.g. political or religious).[159] A famous example of this is Michelangelo's *Pietà*

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[157] See Andrea Bayer, "Renaissance Views of the Unfinished", in *Unfinished*, pp. 18-29 (20); and Hout, *The Unfinished Painting*, pp. 62-65.

[158] See Bayer, *Renaissance Views of the Unfinished*, p. 20.

[159] See Freedberg, "Iconoclasm and Idolatry", in *A Companion to Aesthetics*, ed. by David E. Cooper (Malden, MA, and Oxford: Blackwell, 1995), pp. 207-209 (207); Freedberg, *The Power of Images*; and Freedberg, *Iconoclasts and Their Motives* (Maarssen: Gary Schwartz, 1985), pp. 378-428.

(1498–1499), which was damaged in 1972 by a man who, pretending to be Jesus Christ, struck off the arm and nose of the Madonna with a hammer (fig. 47).[160]

Another condition similar to the unfinished state, from a formal perspective, is that of "failure" or *pentimento,* a frequent phenomenon in art making. It refers to an alteration, often well visible, made by the artist, after a change of mind, usually to a painting or drawing, which is why it is called *pentimento.*[161] An example of *pentimento* can be seen in the *Salvator Mundi* (fig. 48), dated c. 1465–1475, by Antonello da Messina (1430–1479). In fact, as it is evident at a closer view, the hand and the clothing of Christ were first placed in a higher position than the space they currently occupy, as the drawing of two fingers and a reddish strip, emerging from the parts of the neck, indicate. Thus, in their appearance, previous actions on a work of art —the visibility of which is sometimes due to the change in the refractive index of paint that occurs as it ages—can be exchanged for unfinished paintings, but they are not.

The last category of artistic states, the surface of which presents very similar features to an unfinished image, is that of the hidden figures. A hidden image is one in which the content is difficult to grasp. The reasons for this challenge lie in the fact that the contour of this type of figure is almost entirely missing, and also because both colours and shadows are completely absent. These images have been used in experimental psychology, including by Uri Hertz and colleagues, to explore the mechanisms underlying top-down control.[162] One of the classic illusions that they have used depicts a dalmatian dog in a spotted environment (fig. 49). The spots that belong to the dog and those that belong to the background are similar enough to confound the beholder, so that (s)he, most of the time, is incapable of recognising the animal at first sight. The authors argue that verbal instructions (e.g. "This is a dog") are potentially able to make the image pop out, altering the visual system in the

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[160] See Freedberg, *Iconoclasts and Their Motives*, p. 11; and Freedberg, *The Power of Images*, pp. 408-409.

[161] See Jonathan Stephenson, "Pentiment", in *The Dictionary of Art*, ed. by Jane Turner, 34 vols (Basingstoke: Macmillan, 1996), XXIV, p. 370.

[162] See Uri Hertz et al., "Top-Down Control: How the Mind Influences the Brain", 2018, *Unpublished manuscript*. I would like to thank Professor Chris Frith for sharing this unpublished article.

receiver's brain. The *Kanizsa triangle* (fig. 8) is another classic example, inasmuch as it is used in experimental psychology to test the role of the imagination, neural filling-in, and mental completion during the observation of incomplete figures.[163]

This terminological and phenomenological analysis and clarification of different visual states of works of art enables us to offer a definition of the unfinished in the following terms: the unfinished is a specific state wherein the appearance of an artwork depicts the process of creation that the artist undertook to create the work itself, inasmuch as, through it, the viewer can see the underdrawing, the signs of the tools used by the artist, the point at which the artist started to paint or sculpt, and so on. On the contrary, an artwork that does not include these features—such as a shapeless fragment of a broken statue or an irregular abrasion of a painting or drawing —cannot be considered an example of the unfinished.

2   Livingston's Concepts of "Genetic Completion" and "Aesthetic Completion"

The previous section has clarified that not all incomplete images, or their fragments, are necessarily related to the phenomenon of the unfinished. It has also outlined the visual states that may be confused with the unfinished—such as the fragment, damage, failure, and the hidden figure. At this point, we can attempt to define and analyse the three concepts related to finiteness: "finished", "unfinished", and "over-finished". Finished and unfinished are the two polarities with which artists have to deal during the entire process of art creation. Considering them together depends upon two fundamental points: the first is that their difference is often reduced to the minimum terms; the second is that these two levels of finiteness are, most of the time, co-present in each work of art, as we will see.

Whether an artist removes, chipping away at a block of marble or wood, as with sculpture, or adds, applying paint on a two-dimensional support, as in the case of painting, a question arises: when is a work of art finished? In other words, when is the

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[163] See Pessoa, Thompson and Noë, *Finding out about Filling-in*. See also Chapter 6.

right time to stop working? Either in terms of "subtraction" or "addition", the problem of the finiteness of a work of art does not have an easy solution. Pliny, in *Natural History*, was one of the first in classical antiquity to recognise the importance of this issue in art making. Pliny's awareness of this matter is evident when he writes that Apelles identified himself as a painter who "knew when to take his hand away from a picture" (XXXV, 80).[164]

Closely connected to the concept of finiteness are other difficult-to-solve dilemmas; namely, who decides when a work of art is finished? Is it the artist, as Pliny seems to suggest, the patron, the art critic, or the viewer? And then, is the status of finiteness of a work of art stable or does it vary according to the historical and geographical context of the artist, patron, critic, or viewer? In recent aesthetic literature, the problem of completion in artworks has been addressed by Monroe Beardsley, Paisley Livingston, and Darren Hundson Hick, who offered acute observations.[165]

To answer these questions, it is first of all essential to clarify the matter regarding who is in charge of deciding when a work of art is finished. Certainly, the level of finiteness depends on the moment at which the person who is working on it *stops* removing or adding, but this does not mean that the work is finished. Conversely, we can advance that a work of art is complete when the artist *decides* to stop working on it. These situations belong to two very different moments: in the first case the artist *stops* working, and the reason for this interruption includes an involuntary decision due to external forces; whereas in the second case the artist *decides* to stop working, as a consequence of a voluntary decision. Regarding the second case, there are at least four elements, in the Renaissance, which indicate that an artist considered his or her work finished when (s)he stopped working on it. These are: when the artist adds his or her signature to the work; the presence of the so-called Plinian signature on the painting, sculpture, or print, applied by the artist; a record that shows that the artist delivered his or her work to the patron; and more rarely, a written source, by the artist

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[164] Pliny, *Natural History*, IX, p. 320: "quod manum de tabula sciret tollere". Translated in ibid., p. 321.

[165] See Beardsley, *On the Creation of Art*; Livingston, *Art and Intention*; and Hick, *When is a Work of Art Finished?*.

or someone close to him or her, that identifies the work as finished. Without one of these four elements we will never know whether the artist in question considered his or her work finished or not when (s)he stopped working on it. At this point, an additional question arises: what happens when one or more of the above-mentioned records exist to indicate that when the artist stopped working considered his or her work finished but some viewers did not? In other words, how can we explain the reason why what for an artist is finished but for a beholder it is not?

One of the most famous cases in which the discordance between the artist's and beholder's idea of finiteness is evident is the previously mentioned Titian's portrait of Pietro Aretino (fig. 34).[166] From this episode we can deduce that there must be a difference between the moment when an artist is finished and the moment when the work itself is finished, as Beardsley points out:

> The artist generally knows, then, pretty well whether he is finished—but that is not the same as saying that the work is finished. For when the artist has done all he can, the question remains whether the work has enough to it, whether it is worthy of standing by itself, as an object of aesthetic enjoyment. If he judges so, the artist says it is done. If he judges not, the artist says it is unfinished. And of course the threshold of contentment varies enormously from artist to artist.[167]

Therefore, there must be two different categories of finiteness in each work of art: one inherent in the creation of the work itself and another that pertains to its external appearance. This may explain why what for the artist, who mainly focuses on the creative process, is finished, for the viewer, who mainly focuses on the formal appearance, it is not.

This point can be taken further. Taking as examples the "so-called romantic and baroque fragments and ruins", such as the imitation Roman temple built in 1766 by Carlo Marchionni at the Villa Albani in Rome, Livingston argues that they "provide striking examples of complete, self-standing works that have deliberately been made to resemble a part of some larger, missing whole".[168] Commenting on these architectural examples, Livingston continues:

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[166] See § 1.2.
[167] Beardsley, *On the Creation of Art*, p. 299.
[168] Livingston, *Art and Intention*, p. 54.

> The fragmentary nature of which does not warrant the conclusion that the architect's plan was somehow never fully realized, or that a once completed structure has since fallen into disrepair. As paradoxical as it may seem, the work was complete even though it looked like parts of the structure were missing. One may be tempted to say, with regard to such a case, that the work is aesthetically complete qua ruin, yet it is hard to see how any structural or formal conditions in fact determine this sort of completion. Instead, such cases underscore the importance of another sort of completion, which I shall label "genetic" completion. Roughly put, a work is genetically complete only if its maker or makers decide it is so.[169]

What is interesting in this passage, I think, is the distinction between two different conditions inherent in each work of art, namely the "genetic completion"—which depends on the artist's decision and refers to the end of the genesis of the work—and the "aesthetic completion"—which depends on the viewer's judgement and refers to the level of finiteness of the surface of the work. This distinction seems to solve part of one of the chief problems in dealing with approaches to the question of the unfinished, since it explains the frequent contradiction that occurs when an artist considers his or her work finished, whereas the viewer does not, or vice versa.

After having elucidated this aspect, we can say that, following Livingston's distinction, Titian's portrait of Aretino is "genetically complete", since Titian delivered it to its patron, and "aesthetically incomplete" (at least for some viewers), inasmuch as its surface presents visible and large brushstrokes that make it look to a sketch (that is, an unfinished work), as Aretino pointed out. Consequently, Titian and Aretino were in disagreement, probably because they were focusing on two different aspects of the same work. From this distinction, many combinations of these two conditions are possible, so that a work of art can be at the same time: (*i*) "genetically complete" and "aesthetically complete", (*ii*) "genetically incomplete" and "aesthetically incomplete", (*iii*) "genetically complete" and "aesthetically incomplete", and finally (*iv*) "genetically incomplete" and "aesthetically complete".

The first case, the "genetically complete" and "aesthetically complete", occurs when both the artist and the viewer judge the work in question finished. This result may be exemplified by the painting *Venus, Cupid, Folly and Time* (fig. 35), realised by Agnolo Bronzino (1503–1572) between 1540 and 1545. This painting stands out

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[169] Ibid., pp. 54-55.

for its smooth and nuanced brushstrokes, which leave nothing to indicate, from the beholder's point of view, an incomplete painting. As Vasari indicates, the painting was sent to Francis I of France, probably as a gift from Cosimo I de' Medici, ruler of Florence, by whom Bronzino was employed as court painter.[170] The delivery of the painting, as already mentioned, denotes that it was considered finished by Bronzino himself.

The second case, the "genetically incomplete" and "aesthetically incomplete", takes place when both the maker and the beholder consider the work unfinished. This situation frequently emerges in Michelangelo's output. The statue *St Matthew* (fig. 31) serves as a good example. Michelangelo interrupted its creation for overlapping commissions, abandoning it at an early stage.[171] The figure is only half emerged from the block of marble and the signs of the chisel on this portion are well visible, thus the sculpture can be perceived as unfinished by the observer as well.

The third case, the "genetically complete" and "aesthetically incomplete", has already been explored above in the analysis of Titian's portrait of Aretino and, for now, requires no further comment.

The fourth and final combination, the "genetically incomplete" and "aesthetically complete", presents a singular situation, that is, the artist does not consider the genesis of his work complete, whereas the viewer is likely to judge the external appearance of it as finished. How can a work of art present such a level of completeness that satisfies the viewer but not the artist? An interesting case of this situation is offered by Leonardo's *Mona Lisa* (fig. 50), begun in 1503. As observed above, Sebastiano Serlio, in *The Second Book of Perspective*, states that most of the time Leonardo did not finish his pieces because of the dissatisfaction he felt regarding his capabilities, confirming his statement in the *Book of Antonio Billi* more than twenty years

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[170] Vasari, "Degli Accademici del disegno, pittori, scultori e architetti e dell'opere loro, e prima del Bronzino", in id., *Le vite de' più eccellenti pittori scultori e architettori*, VI, pp. 231-255 (234): "Fece un quadro di singolare bellezza, che fu mandato in Francia al re Francesco, dentro al quale era una Venere ignuda con Cupido che la baciava, et il Piacere da un lato et il Giuoco con altri amori, e dall'altro la Fraude, la Gelosia et altre passioni d'amore". For the partnership between Bronzino and the Medici Family, see Carlo Falciani and Antonio Natali (eds), *Bronzino: pittore e poeta alla corte dei Medici* (Florence: Mandragora, 2010).

[171] See § 5.1.

earlier.[172] The *Mona Lisa* is an example of Leonardo's dissatisfaction, as Vasari seems to suggest: "Leonardo undertook to execute, for Francesco del Giocondo, the portrait of Mona Lisa, his wife; and after toiling over it for four years, he left it unfinished".[173] The fact that Leonardo never delivered the painting to its patron, Francesco del Giocondo, could be further confirmation of its unfinished status.[174] Nevertheless, due to the characteristics of verisimilitude and smooth brushstrokes that the painting presents, an observer could hardly agree with Leonardo. After all, the numerous naturalistic details of the figure have been described by Vasari himself:

> [I]n this head, whoever wishes to see how closely art could imitate nature, was able to comprehend it with ease; for in it were counterfeited all the minuteness that with subtlety are able to be painted, seeing that the eyes had that lustre and watery sheen which are always seen in life, and around them were all those rosy and pearly tints, as well as the lashes, which cannot be represented without the greatest subtlety. The eyebrows, through his having shown the manner in which the hairs spring from the flesh, here more close and here more scanty, and curve according to the pores of the skin, could not be more natural. The nose, with its beautiful nostrils, rosy and tender, appeared to be alive. The mouth, with its opening, and with its ends united by the red of the lips to the flesh-tints of the face, seemed, in truth, to be not colours but flesh. In the pit of the throat, if one gazed upon it intently, could be seen the beating of the pulse. And, indeed, it may be said that it was painted in such a manner as to make every valiant craftsman, be he who he may, tremble and lose heart.[175]

From the situation just outlined, a question emerges: what is the factor that may determine for the beholder the aesthetic perception of the finiteness of a work of art? From the sources examined above—and more particularly from what emerges from

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[172] Serlio, *Il secondo libro di prospettiva*, p. 27r; Billi, *Il libro di Antonio Billi*, pp. 51-52. See also § 1.2.

[173] Vasari, "Vita di Lionardo da Vinci", in id., *Le vite de' più eccellenti pittori scultori e architettori*, IV, pp. 15-38 (30): "Prese Lionardo a fare per Francesco del Giocondo il ritratto di Monna Lisa sua moglie, e quattro anni penatovi lo lasciò imperfetto, la quale opera oggi è appresso il re Francesco di Francia in Fontanableò". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, IV, p. 100.

[174] On Leonardo's *Mona Lisa*, see Zöllner, *Leonardo da Vinci, 1452–1519: The Complete Paintings and Drawings* (Köln and London: Taschen, 2003), pp. 240-241.

[175] Vasari, "Vita di Lionardo da Vinci", in id., *Le vite de' più eccellenti pittori scultori e architettori*, IV, pp. 15-38 (30-31): "nella qual testa, chi voleva veder quanto l'arte potesse imitar la natura, agevolmente si poteva comprendere, perché quivi erano contrafatte tutte le minuzie che si possono con sottigliezza dipignere: avvengaché gli occhi avevano que' lustri e quelle acquitrine che di continuo si veggono nel vivo, et intorno a essi erano tutti que' rossigni lividi e i peli, che non senza grandissima sottigliezza si possono fare; le ciglia, per avervi fatto il modo del nascere i peli nella carne, dove più folti e dove più radi, e girare secondo i pori della carne, non potevano essere più naturali; il naso, con tutte quelle belle aperture rossette e tenere, si vedeva essere vivo; la bocca con quella sua sfenditura, con le sue fini unite dal rosso della bocca con l'incarnazione del viso, che non colori ma carne pareva veramente; nella fontanella della gola, chi intentissimamente la guardava, vedeva battere i polsi: e nel vero si può dire che questa fussi dipinta d'una maniera da far tremare e temere ogni gagliardo artefice, e sia qual si vuole". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, IV, pp. 100-101.

the example of Aretino and Titian—we can assume that it can be determined, among many other factors, by the specific cultural context to which the beholder belongs.[176]

At this point, we should recognise that the distinction between "genetic completeness" and "aesthetic completeness" shows us that "when is a work of art finished?" is perhaps not the right question, as it does not lead to a precise answer. Instead, there are two necessary questions: when is a work of art finished for the beholder? When is a work of art finished for the artist? The answer to the first question is that for the beholder an artwork is finished when he or she perceives it as such, according to his or her taste, cultural context, etc. Whereas the second question requires further investigation.

From Livingston's distinction, the status of an artwork as "aesthetically incomplete" is not a reliable indicator of whether it is truly unfinished.[177] As previously seen, a work is "genetically complete" only if its author decides it is, and this decision is independent of the work's formal features: "After all, it is up to the artist to decide when he or she is done, and we are not sympathetic to any producer, critic, or patron who tries to forestall or overturn such a decision".[178] This point is also confirmed by Hick, who argues that "the artist decides not only to cease working, but also decides that no further action shall be taken to change the work".[179] Following these considerations, we can say that the proper question on the part of the artist is: when is the right time to stop working? To address this problem we must take into account the fact that the creative process involves a period of working between two specific moments, as Beardsley states: "Between the thought 'I may be on to something here' and the thought 'It is finished'".[180] Between these two moments there is a series of stages. Each of these stages represents not only a specific moment in the creative process, but also a specific condition, or category, of the unfinished, since, as Beardsley says, "none of these, of course, has the specific quality of the finished painting".[181] Given that any stage presents certain possibilities of development, and

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[176] See § 1.2.
[177] Livingston, *Art and Intention*, pp. 54-55.
[178] Ibid., p. 56.
[179] Hick, *When is a Work of Art Finished?*, p. 69.
[180] Beardsley, *On the Creation of Art*, p. 291.
[181] Ibid., p. 296.

not others, it is the task of the artist (and precisely herein lies his or her ability) to conduct the process of making in the right direction.[182]

It is the last stage, the final declaration of the artist, that remains a problem to solve. John Dewey, in *Art as Experience*, argues that this declaration is under control of the artist throughout the process. Since this declaration cannot exist until the work is finished, in the meantime it can only be in the artist's mind:

> An engraver, painter, or writer is in process of completing at every stage of his work. He must at each point retain and sum up what has gone before as a whole and with reference to a whole to come. Otherwise there is no consistency and no security in his successive acts.[183]

This point is confirmed by Hick, who writes that:

> Until a work is finished, any alterations made to it will not result in a work distinguishable in identity from the final work. That is to say, the process of art making leads to a finished work, and the many stages leading to this state do not identify different *works*, but different stages in the development of the *same* work. Two finished works, however, will be distinguishable and identifiable as *different* works.[184]

In this sense, the finished work can be declared as such by the artist when, as Dewey suggests, the conclusion is not the result of an interruption or cessation, but satisfaction:

> A piece of work is finished in a way that is satisfactory; a problem receives its solution; a game is played through; a situation, whether that of eating a meal, playing a game of chess, carrying on a conversation, writing a book, or taking part in a political campaign, is so rounded out that its close is a consummation and not a cessation. Such an experience is a whole and carries with it its own individualizing quality and self-sufficiency. It is *an* experience.[185]

This point is also in line with previous statement about the role that satisfaction played in Leonardo's decision to consider his works finished or not.[186]

After having analysed the concepts of finished and unfinished, and their implications for both the artist and viewer, one issue remains: the excess of finiteness,

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[182] In this sense, it is in this stage that failure may occur, as we have seen in the previous section of the present Chapter.
[183] Dewey, *Art as Experience*, p. 56.
[184] Hick, *When is a Work of Art Finished?*, p. 70.
[185] Dewey, *Art as Experience*, p. 35.
[186] See § 1.2.

or the over-finished. It is once again Pliny who defines this concept, in a crucial passage that compares and contrasts the capabilities of Apelles and Protogenes:

> But it was Apelles of Cos who surpassed all the painters that preceded and all who were to come after him…His art was unrivaled for graceful charm, although other very great painters were his contemporaries. Although he admired their works and gave high praise to all of them, he used to say that they lacked the glamour that his work possessed…He also asserted another claim to distinction when he expressed his admiration for the immensely laborious and infinitely meticulous work of Protogenes; for he said that in all respects his achievements and those of Protogenes were on a level, or those of Protogenes were superior, but that in one respect he stood higher, that he knew when to take his hand away from a picture—a noteworthy warning of the frequently evil effects of excessive diligence.[187] (XXXV, 80)

It is precisely the excessiveness of diligence noted by Pliny that constitutes the artistic definition of over-finished, that is, a further refinement of a complete work of art that leads to a negative outcome.

This problem, recognised by Apelles and recorded for the first time by Pliny, was developed centuries later by Alberti, who discussed the concept of over-polished (*troppo pulito*) in the visual arts in these terms:

> But one must avoid that famous useless habit, so to say, of those who, whilst they wish that their [works] be completely lacking in every fault and extremely polished, they make a work worn out by age, before it is completed.[188]

In this passage, Alberti warns artists to avoid over-polishing their artworks, otherwise they will fail in their objective. The same concern was expressed by Vasari, when he compared and contrasted the *Singing Gallery* (fig. 25) by Donatello with the *Singing Gallery* by Luca della Robbia (fig. 26).[189] Vasari argued that della Robbia's scenes were very polished and detailed, even too much so, inasmuch as from a certain

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[187] Pliny, *Natural History*, IX, p. 320: "Verum omnes prius genitos futurosque postea superavit Apelles Cous…praecipua eius in arte venustas fuit, cum eadem aetate maximi pictores essent; quorum opera cum admiraretur, omnibus conlaudatis deesse illam suam venerem dicebat…et aliam gloriam usurpavit, cum Protogenis opus inmensi laboris ac curae supra modum anxiae miraretur; dixit enim omnia sibi cum illo paria esse aut illi meliora, sed uno se praestare, quod manum de tabula sciret tollere, memorabili praecepto nocere saepe nimiam diligentiam". Translated in ibid., p. 321.

[188] Alberti, *Il nuovo De pictura di Leon Battista Alberti*, pp. 268-269: "Né in poche cose più si pregia la diligenza che l'ingegno; ma conviensi fuggire quella decimaggine di coloro, i quali volendo ad ogni cosa manchi ogni vizio e tutto essere troppo pulito, prima in loro mani diventa l'opera vecchia e sucida che finita". Translated in ibid.

[189] See Giovanni Poggi, *Il Duomo di Firenze: Documenti sulla decorazione della chiesa e del campanile tratti dall'Archivio dell'Opera*, 2 vols (Berlin: Cassirer, 1909), pp. 257-262; Pope-Hennessy, *Donatello Sculptor*, pp. 103-112; and Pope-Hennessy, *Luca della Robbia* (Oxford: Phaidon, 1980), pp. 225-231.

distance, it was not possible to see the details properly. As a consequence, those minutiae are lost to the eye of the beholder:

> Next, on the great cornice of this ornament Luca placed two figures of gilded metal—namely, two nude angels, wrought with a high finish, as is the whole work, which was held to be something very rare, although Donatello, who afterwards made the ornament of the other organ, which is opposite to the first, made his with much more judgment and mastery than Luca had shown, as will be told in the proper place; for Donatello executed that work almost wholly with bold studies and with no smoothness of finish, to the end that it might show up much better from a distance, as it does, than that of Luca, which, although it is wrought with good design and diligence, is nevertheless so smooth and highly finished that the eye, by reason of the distance, loses it and does not grasp it well, as it does that of Donatello, which is, as it were, only sketched.[190]

Furthermore, Vasari, who believed that too much effort or extreme diligence would ruin a work, blamed those artists who did not know when it was time to stop:

> To this matter craftsmen should pay great attention, for the reason that experience teaches us that all works which are to be viewed from a distance, whether they be pictures, or sculptures, or any other similar thing whatsoever, have more vivacity and greater force if they are made in the fashion of beautiful sketches than if they are highly finished; and besides the fact that distance gives this effect, it also appears that very often in these sketches, born in a moment from the fire of art, a man's conception is expressed in a few strokes, while, on the contrary, effort and too great diligence sometimes rob men of their force and judgment, if they never know when to take their hands off the work that they are making. And whosoever knows that all the arts of design, not to speak only of painting, are similar to poetry, knows also that even as poem thrown off by the poetic fire are the true and good ones, and better than those made with great effort, so, too, the works of men excellent in the arts of design are better when they are made at one sitting by the force of that fire, than when they go about investigating one thing after another with effort and fatigue. And he who has from the beginning, as he should

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[190] Vasari, *Vita di Luca della Robbia*, p. 51: "Sopra il cornicione poi di questo ornamento fece Luca due figure di metallo dorate, cioè due Angeli nudi condotti molto pulitamente, sì come è tutta l'opera, che fu tenuta cosa rara: se bene Donatello, che poi fece l'ornamento dell'altro organo che è dirimpetto a questo, fece il suo con molto più giudizio e pratica che non aveva fatto Luca, come si dirà al luogo suo, per avere egli quell'opera condotta quasi tutta in bozze e non finita pulitamente, acciò che apparisse di lontano assai meglio, come fa, che quella di Luca; la quale, se bene è fatta con buon disegno e diligenza, ella fa nondimeno con la sua pulitezza e finimento che l'occhio per la lontananza la perde e non la scorge bene come si fa quella di Donato, quasi solamente abbozzata". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, II, pp. 120-121.

have, a clear idea of what he wishes to do, ever advances resolutely and with great readiness to perfection.[191]

Vasari confirmed this assumption in *On Sculpture* (*Della scultura*), when he stated that sculptures that have to be placed far from the eyes do not need to be over-polished, because at that height

> the finish of the last touches is lost, though the beautiful forms of the arms and legs, and the good taste displayed in the cast of drapery, with folds not too numerous, may easily be recognized; in this simplicity and reserve is shown the refinement of the talent.[192]

In sum, this section has clarified some aspects of the concept of finiteness in the visual arts. First, it recognised two categories of finiteness (or conditions) in each work of art, as proposed by Livingston: "genetic completeness" and "aesthetic completeness". Whereas it is the artist who decides when it is the right time to stop working on a piece, judgement about its completeness varies from artist to artist and from viewer to viewer. Second, the decision of the artist may depend on his or her satisfaction. Third, the perception of the viewer may be linked to many factors, including the cultural context (s)he belongs to and his or her personal taste. In this sense, his or her perception is not necessarily in accordance with the artist's decision. Finally—as Pliny, Alberti, and Vasari believed—it is crucial for an artist to know when it is the right time to stop working, because, in some cases, the over-finished does nothing but compromise the correct vision of the work. Analysed in conjunction with the phenomenon of the unfinished in the visual arts, the concept of an over-

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[191] Vasari, *Vita di Luca della Robbia*, pp. 51-52: "Alla quale cosa deono molto avere avvertenza gl'artefici, perciò che la sperienza fa conoscere che tutte le cose che vanno lontane—o siano pitture o siano sculture o qualsivoglia altra somigliante cosa—hanno più fierezza e maggior forza se sono una bella bozza che se sono finite; et oltre che la lontananza fa questo effetto, pare anco che nelle bozze molte volte, nascendo in un sùbito dal furore dell'arte, si sprima il suo concetto in pochi colpi, e che per contrario lo stento e la troppa diligenza alcuna fiata toglia la forza et il sapere a coloro che non sanno mai levare le mani dall'opera che fanno. E chi sa che l'arti del disegno, per non dir la pittura solamente, sono alla poesia simili, sa ancora che come le poesie dettate dal furore poetico sono le vere e le buone e migliori che le stentate, così l'opere degli uomini eccellenti nell'arti del disegno sono migliori quando sono fatte a un tratto dalla forza di quel furore che quando si vanno ghiribizzando a poco a poco con istento e con fatica; e chi ha da principio, come si dee avere, nella idea quello che vuol fare, camina sempre risoluto alla perfezzione con molta agevolezza". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, II, p. 121.

[192] Vasari, *Della scultura*, p. 84: "Debbono le figure, così di rilievo come dipinte, esser condotte più con il giudicio che con la mano, avendo a stare in altezza dove sia una gran distanza; perché la diligenza dell'ultimo finimento non si vede da lontano, ma si conosce bene la bella forma delle braccia e delle gambe et il buon giudicio nelle falde de' panni con poche pieghe, perché nella simplicità del poco si mostra l'acutezza dell'ingegno". Translated in Vasari, *Vasari on Technique*, p. 145.

finished work can be exemplified by an artwork worked in excess by its creator, as in, for example, Luca della Robbia's *Singing Gallery*.

3   Categories of the Unfinished: A Classification

The terminological and aesthetic analysis of the phenomenon of the unfinished suggests, unsurprisingly, that the level of finiteness of visual works of art varies from case to case. For this reason, it is useful to distinguish not only between different levels of finiteness (i.e. "finished", "unfinished", and "over-finished") but also different types of unfinishedness. Here I wish to propose a division of the unfinished into four categories, or degrees of unfinishedness, with relative examples in painting, sculpture, drawing, and print, from the less unfinished to the more unfinished: "almost finished", "partly finished", "sketched", and "part missing". Admittedly schematic, such a division may help in the further analysis of responses to unfinished works of art. Indeed, I am inclined to contend that each category elicited and continues to elicit different kinds of aesthetic response.

In adopting this approach, I begin with the appearance of FINISHED works of art in paintings, sculptures, drawings and prints:

PAINTING.   In painting, the "finished" is encapsulated in the features of Bronzino's *Venus, Cupid, Folly and Time* (fig. 35), that is, a work that includes complete figures realised with smooth brushwork.

SCULPTURE.   In sculpture, the "finished" is well represented by Michelangelo's *Pietà* (fig. 51), realised between 1498 and 1499, inasmuch as it presents complete figures with a polished surface.

DRAWING.   Even though drawings in the Renaissance were usually realised in preparation for either paintings or sculpture, and therefore considered mere sketches, there are also examples of what we might consider "finished" drawings, which have the features of complete figures made with a well-distributed *chiaroscuro*, regular and smooth, as in *A Man Carrying an Older Man on His Back* (fig. 52), realised by Raphael (1483–1520) between c. 1513–1514.

PRINT.   In print, the "finished" can be exemplified by *The Massacre of the Innocents* (fig. 53), an engraving realised by Marcantonio Raimondi between c. 1512 and 1513. This work stands out for its

refined figures, shaded with a smooth *chiaroscuro*, realised with a regular hatch texture. The high level of finiteness of this engraving becomes increasingly evident when compared with its model: a rather sketched (particularly on the right) drawing by Raphael (fig. 54), bearing the same title and realised between c. 1510 and 1514.

At this point we have the instruments to attempt a division within the category of the unfinished. In this sense, the first type, the ALMOST FINISHED, mainly visible at a closer view, refers to those works of art that did not receive final refinements as a consequence of either a deliberate action or an involuntary choice:

PAINTING.   In painting, the "almost finished" has the features of less highly detailed figures placed far from the viewer or in the background of a scene. This solution was mainly suggested and adopted by Leonardo, as is evident in the mountains painted in the background of the *Mona Lisa* (fig. 55).

SCULPTURE.   In sculpture, an example of this category is Donatello's *Singing Gallery*, which exhibits a slightly rough surface for reasons linked to the mechanisms of visual perception (fig. 27). The barely perceptible streaks left by a tooth chisel are good indicator of sculptures belonging to this category. This shrewdness was suggested by different artists and theorists, such as Leonardo, Vasari, and Borghini.[193] In this sense, the unfinished is the consequence of a purposeful choice. It is about a genetically finished artwork that possesses the aesthetic features of an unfinished artifact. This is why most of the works belonging to this category are considered complete by their authors, even though their formal appearance is not entirely finished.

DRAWING.   In drawing, the "almost finished" is mainly recognisable in hatching that is large and not uniform, as in the background of *The Pietà with Four Saints* (fig. 56), realised by Andrea del Sarto (1486–1530) in 1528. In fact, the discrepancy between the more refined figures in the foreground and the approximative hatching that outlines the setting in the background is highly visible.

PRINT.   In print, the "almost finished" is clear in the *Speculum Romanae Magnificentiae: Column of Antoninus and a Roman Obelisk* (fig. 57), dated c. 1543–1570 and attributed to Enea Vico (1523–1567). Whereas the principal figures of this etching are complete and well-defined, other small human and animal figures, particularly those depicted on the base of the Column of Antoninus, are sketched and not detailed. This choice reflects Leonardo's,

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[193] See § 1.2. See also Gombrich, *Art & Illusion*, pp. 162-163.

Vasari's, and Borghini's notes on the representation of small figures.

The second category of the unfinished, the PARTLY FINISHED, refers to works of art that have been interrupted and abandoned in the middle of the process of their creation. Though incomplete, the figures are often well recognisable:

PAINTING. In painting, the "partly finished" is exemplified by Leonardo's *Adoration of the Magi* (fig. 18). A careful observation of this work reveals that, whereas the foliage of the trees received a first layer of colour, the rest of the painting remains in a state of initial *chiaroscuro*, leaving the underdrawing clearly visible.

SCULPTURE. In sculpture, "partly finished" figures have not completely emerged from the block of marble and present a very evident rough surface due to the chisel strokes. Ancient examples of this type include the marble group representing *Dionysos and a Satyr* (fig. 58), dated to the early third century BC; and the surviving section of an unfinished horse in limestone (fig. 59), datable to about 500 BC. The first group of statues is mainly worked at the front and sides, leaving part of the limbs of the two figures inside the stone and the chisel strokes well visible. In the second sculpture, the outline is incised and then roughly cut round. A bridle is indicated and, on the extreme left, perhaps the knee of the rider.

DRAWING. In drawing, this type is very well recognisable in figures that have been outlined but not entirely shaded. An example is Michelangelo's *Study of a Male Nude in Three-Quarter Length, Looking Down to the Right (Study for the Final Version of the Minerva Risen Christ)*, dated c. 1520. As is evident, only the lower half of the figure presents the *chiaroscuro*, whereas the rest is only delineated (fig. 60).

PRINT. In print, these same characteristics are evident in *The Battle between the Romans and the Sabines*, traditionally called the rape of the Sabines, created by Jacopo Caraglio (1500–1565) after Rosso Fiorentino in 1527. We have two different states of this same print: one finished (fig. 61) and the other "partly finished" (fig. 62). A comparison of these two states makes clear the level of unfinishedness of the second print, in which the majority of the figures depicted are only outlined. Even the *chiaroscuro*, where present, has only just begun.

This category of unfinishedness encompasses most of the works that have been interrupted due to unforeseen events—that is, the death of the artist, overlapping

commissions, lack of fundings, etc. For this reason, we can say that these works are, most of the time, "genetically incomplete" and "aesthetically incomplete".

The third category, the SKETCHED, refers to those works of art with rough and irregular surfaces. For this reason, the signs of the instruments used by the artist during the process of creation are often recognisable, such as different types of brushes, chisels, pencils, and burins:

PAINTING.   Paintings belonging to this category are characterised by large and visible brushstrokes, at least in some parts, as in Titian's *Portrait of a Lady and her Daughter* (fig. 63), dated c. 1550. In this work, some elements of the painting—the flower and the hand of the young girl—are so sketched that they are difficult to discern.

SCULPTURE.   Sketched sculptures have a very rough and uneven surface, as is evident in Donatello's bronze sculpture *Lamentation over the Dead Christ* (fig. 64), dated c. 1455–1460. The *Lamentation* is a group of six figures in which the Virgin sinks to the ground with the dead Christ across her lap, while grief-stricken mourners encircle them. The entire sculpture is harshly sketched out, with large gaps in the thigh and left elbow of the second woman from the right. The facial features of the figures are approximate, particularly in the bent figure behind Mary Magdalene. Even though little is known about the destination of this work, the just mentioned lacunae, together with the unusual perforation between the two hands of the woman on the left and the interrupted chisel of the Virgin's halo, leave us with the impression that this sculpture was abandoned as a consequence of an unforeseen event.[194]

DRAWING.   In sketched drawings, the *chiaroscuro* of figures is roughly sketched out and does not depict details, so as to produce a blurred effect, as in Tintoretto's *Study of a Seated Nude* (fig. 65), dated c. 1549.

PRINT.   Sketched prints involve similar characteristics to sketched drawings: the hatching of the *chiaroscuro* is irregular and imprecise. An example in this sense is *The Return of the Prodigal Son who Falls at his Father's Feet* (fig. 66), drawn by Andrea Schiavone (c. 1510–1563) in c. 1536–1540.

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[194] On Donatello's *Lamentation over the Dead Christ*, see Nicholas Penny, "Non-finito in Italian Fifteenth-Century Bronze Sculpture", in *La Scultura: Studi in Onore di Andrew S. Ciechanowiecki, Antologia di Belle Arti* (Turin: Umberto Allemandi, 1994), pp. 11-15.

The last category, the PART MISSING, applies to those works of art that have been left interrupted in such a way that some of their parts are partially or fully complete whereas others are completely blank. The peculiarity of these types of artworks is that they present a void space, often emerging from a section that is crucial for the comprehension of the figure(s) depicted. In the case of the representation of a human figure, for example, the empty space often takes the place of a face, an arm, a leg, and so on:

PAINTING.   *The Entombment of Christ* (fig. 67), a painting begun in c. 1500–1501 and attributed to Michelangelo, is a good example of this category. It shows the dead Christ supported by Joseph of Arimathea and surrounded by St John the Evangelist, on the left, and probably Nicodemus, on the right. The other three figures are supposed to be the so-called three Marys: Mary Magdalene, kneeling on the left; Mary Salome, standing on the right; and the Virgin Mary, who had to be painted in the blank shape in the lower right-hand corner.[195] None of these figures is finished, and even the landscape has some blank spaces. What is remarkable in this painting is that, although it is not finished, it is not even a sketch, as the painter avoided visible brushworks and painted (and finished) the work one piece at a time. The result is that, whereas some parts, rather than undefined, are completely empty, others are highly finished. Therefore, we can advance that the interruption of *The Entombment of Christ* is not the result of an aesthetic choice. The reason behind the commission of this painting is unknown, as well as its interruption, even though the chronology of Michelangelo (if he is the painter) may suggest that he abandoned it for another endeavour: the sculpture of *David*.[196]

SCULPTURE.   An example of an unfinished sculpture in the category of "part missing" is the Roman strigillated sarcophagus with portrait of a couple, bucolic scene under clypeus, and philosopher and muse at ends (fig. 68), dated to the third century. The two portraits of the deceased husband and wife were never finished: their faces are blank (fig. 69). Under the busts of the two figures are acanthus leaves, unfinished as well. Interestingly, whereas they have not yet been chiselled, they have been drilled, as eight holes on the foliage show. This provides insight into the order of operations within a typical Roman workshop. The drill was used first for initial

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[195] For the *Entombment of Christ*, see Alexander Nagel, *Michelangelo and the Reform of Art* (Cambridge, MA: Cambridge University Press, 2000), pp. 25-33.

[196] For the debate about the patronage of the *Entombment of Christ*, see Zöllner, "Catalogue of Paintings", in *Michelangelo: Complete Works*, pp. 404-433 (407).

indexing (in this case, to index the separation of the leaves). Only after this passage, did sculptors turn to the chisel for further differentiation of the leaves. This particular sarcophagus, however, was abandoned before completing the next step, usually accomplished at the time of purchase.[197]

DRAWING.   In drawing, this category of the unfinished is best exemplified by Leonardo's *Study of a Bust of a Woman* (fig. 70), dated c. 1500. Here, Leonardo delineated the bust of a young female body in red chalk and *chiaroscuro*. He omitted the face of the woman, in stark contrast with the rest of the drawing, thus leaving it incomplete.

PRINT.   Finally, the unfinished in the category of "part missing" in print is evident, for example, in *The Massacre of the Innocents* (fig. 71), realised by Hendrick Goltzius (1558–1617) in c. 1585–1586. The empty spaces are easily recognisable because they appear instead of meaningful parts of the figures depicted—such as faces, limbs, or other sections of the body—as in the small figure in the foreground.

Most of the artworks belonging to this last category, we can deduce, were unintentionally unfinished. Nevertheless, we can find exceptions, in more recent times, in other kinds of images. In the case of the classic *Kanizsa triangle* (fig. 8), for instance, which has played such an important role in the history of the role of illusion in visual representation, the image is said to possess illusory (or missing) contours and is expected to be completed in the beholder's mind.[198]

Therefore, in ancient and Renaissance art, figures with empty spaces can be referred to as "genetically incomplete", because the artist did not have time to complete the process of creation, and "aesthetically incomplete", inasmuch as the figures represented the lack of some parts. In experimental psychology, on the other hand, the hidden figures—such as the *Kanizsa triangle*—are "genetically complete", because the artist achieved the scope—that is, to mentally involve the beholder in art creation, and for this reason the void is justified—and "aesthetically incomplete", because the observer does not see the entire image.

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[197] See Ben Russell, "The Roman Sarcophagus 'Industry': A Reconsideration", in *Life, Death and Representation: Some New Work on Roman Sarcophagi*, ed. by Jaś Elsner and Janet Huskinson (Berlin and Boston: De Gruyter, 2011), pp. 119-147.

[198] See Pessoa, Thompson and Noë, *Finding out about Filling-in*. See also Chapter 6.

In this sense, the focus of this research on the unfinished is on the aesthetically incomplete, since it investigates the responses of beholders to incompleteness. The task of the following chapters is to propose how beholders may respond, at a biological level, to these kinds of images.

CHAPTER THREE

Towards a Theory of Aesthetic Response

This chapter investigates the notion of "response" and the biological processes underlying the observation of images. To accomplish this goal, the first section analyses the concept of the power of images, proposed by David Freedberg in 1989 and then deepened by recent neuroaesthetic research. One of the most interesting aspects of this concept is that, in focusing on the biological level of visual perception, it shows what viewers share in responding to images rather than what differentiates them (e.g. context, gender, ideology, education).

Building on this theory, the second section analyses another important aspect of the notion of response: the phenomenon of empathy. It does so by focusing on philosophical and neuroscientific concepts and theories, such as attention, *Einfühlung*, the self, embodied simulation, and emotion.

1 "The Beholder's Share"

What is the response of beholders to unfinished works of art? This is the question that this investigation aims to address. We must guard against the urge to provide a rapid answer in the form of an assertion. We must stay with the question. We must pay attention to the way in which the question asks: how do beholders respond to unfinished images? We need to analyse the key terms: unfinished, (unfinished) image, response, beholder. The previous two chapters analysed the notion of the unfinished and the morphologies of unfinished images. We will now attend to the other key words, namely, *response* and *beholder*. First, what does *response* mean in art? Is it possible to formulate a theory of response with reference to images in general and the unfinished in particular? And second, what type of beholders are we talking about?

What type of attention is involved? This is, in my view, the most thought-provoking question in contemporary art history: how do we respond to images?

Despite its recent application in neuroaesthetics and experimental aesthetics, the notion of response has not yet received an in-depth treatment. A first important application of this idea to the study of works of art is found in David Freedberg's *The Power of Images: Studies in the History and Theory of Response*.[199] As Freedberg's book title suggests, to formulate a theory of response or, better yet, a theory of aesthetic response, it is worth taking into account the notion of the power of images.

1.1   Freedberg and the Power of Images

To analyse our question properly—that is, the question of how beholders respond to unfinished images—we should think about the relationship between the notion of response and that of the power of images. What is the "power of images"? To what kind of power does this concept refer? In *The Power of Images*, Freedberg makes a "distinction between objects that elicit particular responses because of imputed 'religious' or 'magical' powers and those that are supposed to have purely 'aesthetic' functions".[200] The determining role played by images in religion and magic was famously set out by Benjamin, who observed that, "originally, the embeddedness of an artwork in the context of tradition found expression in a cult. As we know, the earliest artworks originated in the service of rituals—first magical, then religious".[201] In these passages, two of the kinds of powers that images may express are mentioned: religious power and magical power. Forces like these, as many examples demonstrate, may involve the beholder in different ways. These powers are precisely those elements to which the beholder responds. Therefore, in art, power can be defined this way: Aesthetic power is a force that acts on beholders by means of specific forms. This force may elicit an emotional or motor response in the beholder—it depends on

[199] Freedberg, *The Power of Images*.
[200] Ibid., pp. xxi-xxii.
[201] Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, in id., *Selected Writings*, trans. by Edmund Jephcott et al., ed. by Howard Eiland and Michael W. Jennings, 4 vols (Cambridge, MA, and London: Harvard University Press, 2003), IV, pp. 251-283 (256).

what it is represented in the image and where the beholder concentrates his or her attention—by activating specific brain networks and bodily sensations or feelings.

But how does this power of images manifest itself? As Freedberg suggests, this power manifests itself in the relationship that takes place "between images and people in history".[202] However, the energy of this relationship is not unidirectional. Rather, it is bidirectional, meaning that it can be directed from the image to the beholder—in which case the latter is moved by the forms contained in the image he or she is observing—or from the beholder to the image—in which case the image is affected by the beholder (as in an act of vandalism, for instance). In both cases, "the ways in which people of all classes and cultures have responded to images" are the indications of the existence of such a power.[203] But what does it mean to respond to an image or, better yet, to the force that an image may contain? An extract of the *Power of Images* is indicative in this sense:

> People are sexually aroused by pictures and sculptures; they break pictures and sculptures; they mutilate them, kiss them, cry before them, and go on journeys to them; they are calmed by them, stirred by them, and incited to revolt. They give thanks by means of them, expect to be elevated by them, and are moved to the highest levels of empathy and fear. They have always responded in these ways; they still do. They do so in societies we call primitive and in modern societies; in East and West, in Africa, America, Asia, and Europe.[204]

Viewers' reactions may vary according to the type of image observed and, of course, can vary from viewer to viewer. But is this always the case? Are these responses always subjective or are there some uniform patterns of responses? Finally, what are the elements that give rise to such power?

1.2 Phenomenology of Response

In order to answer the first question—that is, whether or not we can talk about universal responses—it is useful to refer to another passage of the *Power of Images*. The kind of responses that Freedberg refers to are the psychological and behavioural ones, which "appeared to have been observed throughout history and across cultures,

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[202] Freedberg, *The Power of Images*, p. xix.
[203] Ibid.
[204] Ibid., p. 1.

whether 'civilized' or 'primitive'".[205] Many of these can be defined as "unrefined, basic, preintellectual, raw"[206] and refer to biological reactions that are common to all human beings:

> There still remains a basic level of reaction that cuts across historical, social, and other contextual boundaries. It is at precisely this level—which pertains to our psychological, biological, and neurological status as members of the same species —that our cognition of images is allied with that of all men and women, and it is this still point which we seek. No claim is to be made here that twentieth-century beholders respond to sixteenth-century images in the way sixteenth-century beholders might have (although we well may).[207]

Thus, the biological approach to images integrates with the art-historical research, which wonders what distinguishes each culture and age. In this sense, neuroaesthetics complements the history of art by observing what different cultures and periods, and people of diverse cultures and periods, share.

Now we come to the second question: what are the elements within a work that give rise to this power? To define those elements that provoke a particular biological response in the beholder require a classification that goes "by classes of response rather than by classes of images", as Freedberg suggests.[208] It is by investigating the origin of the aesthetic response that we should be capable of grasping the nature of the power of images, that is, the elements that give rise to such a power. Put another way, we would be able to find the visual formula that attracts the beholder's attention and gives rise to a specific reaction.

Given these considerations, we can propose a definition of the notion of response in the following terms: In art, response is a reaction, inward or outward, to the force emanated by the forms, or formulas, contained in images outside the beholder (and in some case also in mental images),[209] and it is aroused by the relationship between beholders and images. When the relationship is analysed from the perspective of art-to-viewer, it is a relationship of power, and when it is viewer-to-art, it is a relationship of empathy. In this sense, power and empathy are neither similar nor opposing concepts.

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[205] Ibid., pp. xix-xx.
[206] Ibid., p. xx.
[207] Ibid., pp. 22-23.
[208] Ibid., p. xxi.
[209] See Chapter 4.

To understand the effectiveness of the power of works of art, it seems essential to investigate the extent to which these responses to images are "of the same order as our responses to reality", as Freedberg suggests.[210] Before Freedberg, Thomas Puttfarken pointed out this problem, when he expressed the need for a distinction "between the way we perceive pictures (and the effect they have on us) and the way we perceive and are affected by the real world around us".[211] As Freedberg points out, it is difficult to imagine that the two types of responses are of the same order: "To respond to a picture or sculpture 'as if' it were real is little different from responding to reality as real".[212] However, I propose, this difference would be minimised (but not reset) by the automatic activation of the beholder's imagination, as the embodied simulation theory seems to suggest.[213] For example, when a beholder contemplates the representation of a suggested goal-directed movement, (s)he is potentially able to imagine, by a process of embodied simulation, the entire movement, starting from the single fraction of time represented in the picture. It is in this sense that to respond to reality and to respond to the representation of reality are two similar experiences, though not the same, inasmuch as the need for imagination would be stronger in the latter case.

Given this understanding of aesthetic response, the next question is this: how do aesthetic responses occur? In explaining what phenomenology is, Maurice Merleau-Ponty states that it "is also a philosophy for which the world is always 'already there' prior to reflection".[214] In another passage of the *Phenomenology of Perception*, he says that "to return to the things themselves is to return to this world prior to knowledge".[215] In this regard, "prior to reflection" and "prior to knowledge" are the two key concepts for our purpose (i.e. for the study of the process of the aesthetic responses). In fact, the kind of responses that we are interested in are those that occur at a pre-reflective and precognitive level, that is, "kinds of responses that were

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[210] Freedberg, *The Power of Images*, p. 438.
[211] Thomas Puttfarken, *Roger de Piles' Theory of Art* (New Haven: Yale University Press, 1985), p. ix.
[212] Freedberg, *The Power of Images*, p. 438.
[213] For the embodied simulation theory, see the second section of the present Chapter. For the role of visual imagination in aesthetic response, see Chapter 4.
[214] Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. by Donald A. Landes (London and New York: Routledge, 2014), p. lxx.
[215] Ibid., p. lxxii.

generally separated from learned and educated response, what one might call high and critical response", as Freedberg states.[216]

Therefore, the distinction to be made is between two different levels of responses, that is, behavioural and psychological responses—which apply to everyone—on one side, and high and critical responses—which only apply to those who are learned and educated—on the other:

> We who are educated look and behave in detached ways, we become high formalists, and we deny the wellsprings of the power inside and outside ourselves. We also omit those aspects of feeling and emotion that are usually left outside cognition and are considered so fine-grained and distinctive that they cannot be held by anything but the most anecdotal procedures in history. These too are what I reclaim…both for cognition and for history.[217]

That means that, during contemplation, there might be a level of response that is neither determined by culture, nor by knowledge, nor by other personal factors; on the contrary, it is determined by nature alone. As Freedberg and Gallese argue: "We noted that such processes might be precognitive and not always dependent on perception informed by cognition and cultural stock".[218] These precognitive responses refer to the activation of mental faculties—such as empathy, imagination, and hereditary memory—and inner mechanisms encompassing the simulation of motions, emotions, and corporeal sensations. For such processes have a biological base, meaning that the responses that follow an observation are not necessarily under our control, they may be unconscious.

The existence of a pre-reflective stage in aesthetic response is also proposed by Nelson Goodman. In *Languages of Art*, Goodman addresses a controversial aspect in art history and aesthetics: the function of emotion in art understanding.[219] In this regard, he states: "The distinction between the scientific and the aesthetic is somehow rooted in the difference between knowing and feeling, between the cognitive and the emotive".[220] He continues: "The work of art is apprehended through the feelings as

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[216] Freedberg, *The Power of Images*, p. xxi.
[217] Ibid., p. 430.
[218] Gallese and Freedberg, *Mirror and Canonical Neurons are Crucial Elements in Esthetic Response*.
[219] Nelson Goodman, *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis: Hackett, 1976), pp. 245-252.
[220] Ibid., p. 245.

well as through the senses….Emotion in aesthetic experience is a means of discerning what properties a work has and expresses".[221] The dichotomy between cognition and emotion explains that there are at least two ways to understand art: one is intellectual and the other is emotive, and they are complementary. Privileging one approach over the other would yield a reductionist idea of art, of its meaning and power.

We understand the emotions of others by feeling emotions (and it does not matter whether we mirror the observed emotions or not), both in real life and in art: "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".[222] Freedberg expresses a similar idea by examining the *Descent from the Cross* (fig. 72), dated c. 1435, by Rogier van der Weyden (1399 or 1400–1464):

> Does the success of an artwork such as *Descent from the Cross* depend on the artist's ability to evoke our direct emotional responses, irrespective of our historical knowledge? We may say that such an ability is a measure, not of the aesthetic, but rather of all effective images, artistic or not.[223]

What is most thought-provoking in art history in our time, I argued, is the question of how beholders respond to images. But who are these beholders? Educated people of our times? All the people who go to museums and art galleries? Who else? Crucially, *beholders* means each beholder, each time and place (s)he finds him- or herself before a work of art, without any other distinction. In this regard, Freedberg states: "The modern beholder's response is likely to be the same—or as strong—as that of the sixteenth-century viewer".[224] This is true inasmuch as the responses that we are interested in are, as previously stated, biological and, therefore, universal.

In this section, I argued that there is a correlation between the aesthetic response and the power of images, but in what kind of images do we find this power? As *The Power of Images* shows, this power emerges not merely from so-called artistic images (e.g. the paintings, sculptures, drawings, and prints that constitute the history of art) but from images in a broader sense, including those not regarded as high art (e.g. wax

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[221] Ibid., p. 248.
[222] Ibid., p. 249.
[223] Freedberg, *Memory in Art: History and the Neuroscience of Response*, p. 347.
[224] Freedberg, *The Power of Images*, p. 18.

images, funeral effigies, pornographic illustrations, and the whole range of billboards and posters). In this regard, Freedberg states: "While I suggest that we may reclaim the power of images by attending to the forceful effects of some great works, I do not wish to propose that we need great art for that".[225]

1.3   Warburg and Pathos-formulas

In his *Problem of Form in Painting and Sculpture* (1893), Adolf von Hildebrand observes that an image may present several appearances and that each of them may offer a different view:

> Since one and the same object may produce many different visual appearances according as it is viewed from different positions and under different circumstances, there arises for the painter and for the sculptor this question: are all these views of equal value or, if not, how shall their varying values be measured?[226]

For Hildebrand, different visual perspectives (as in the case of a three-dimensional object seen from different positions) and different circumstances (such as the vision of the same object under different shades of light) give rise to different views. But are there other conditions that may cause a single object to have diverse visual appearances? If we take into consideration an unfinished sculpted figure depicted in such a position as to convey movement to the observer, as in the case of Michelangelo's *Slaves* (figs. 10–13), for instance, we find a confirmation of what has been argued. That is, different elements of the same image can generate different responses to that image. For example, one view of the *Slaves* may be the movement (giving rise to a specific aesthetic response), a second view may be the rough surface (producing a different response from the previous one), a third view may be the missing limbs (arousing a different response from the previous two), etc. In this sense, might these different responses measure the "varying values" that Hildebrand refers to in the aforementioned passage? And, if so, might neuroscience be the most

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[225] Ibid., p. 433.
[226] Adolf von Hildebrand, *The Problem of Form in Painting and Sculpture* (New York: Garland, 1978), p. 17.

appropriate instrument to measure them? The work of other thinkers may offer important indications.

In a letter dated 9 August 1903, addressed to Adolph Goldschmidt and titled "The Directions of Art History", Aby Warburg briefly outlines a series of different approaches to the study of art history.[227] In the letter, Warburg makes clear that he considers himself the only art historian who investigates "the nature of man's expressive movements", an aspect of art which, as we must assume from Warburg's body of work, should be investigated if we are to understand the transmission of antique culture—or the afterlife (*Nachleben*) of antiquity—in Renaissance art.[228]

In order to conceptualise the trend that he was undertaking in the study of art history, Warburg, in many of his writings and notes, gave shape to the concept of *Pathosformeln* (formulas of pathos), which refers to a series of recurrent emotional gestures and postures in art—such as hands crossing the breast in fear or devotion, arms cast upwards in grief or horror, hands crossed in desperation, hands that wipe the tears from the eyes in sorrow, and the hand supporting a disconsolate or melancholy face, as in Albrecht Dürer's engraving *Melencolia I* (fig. 73), dated 1514.[229] It was Warburg himself who suggested, in *Festwesen*, the meaning of the formulas he found: "The extremes of physiognomic expression in the moment of the highest excitement

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[227] Aby Warburg, *Werke in einem Band*, ed. by Martin Treml, Sigrid Weigel and Perdita Ladwig (Frankfurt am Main: Suhrkamp, 2010), pp. 672-679 (672): "Die Richtungen der Kunstgeschichte".

[228] Ibid., p. 676: "die Natur des mimischen Menschen". Translated in Gombrich, *Aby Warburg*, p. 143.

[229] For more on the concept of *Pathosformel*, see Freedberg, *From Absorption to Judgment*, pp. 148-151; Wedepohl, "Mnemosyne, the Muses and Apollo: Mythology as Epistemology in Aby Warburg's Bilderatlas", in *The Muses and their Afterlife in Post-Classical Europe*, ed. by Kathleen W. Christian et al. (London and Turin: The Warburg Institute and Nino Aragno, 2014), pp. 211-270; Freedberg, "Dürer's Limbs", in *The Young Dürer: Drawing the Figure*, ed. by Stephanie Buck and Stephanie Porras (London: Courtauld Gallery and Paul Holberton, 2013), pp. 37-56; Wedepohl, "Von der Pathosformel zum Gebärdensprachatlas. Dürers Tod des Orpheus und Warburgs Arbeit an einer ausdruckstheoretisch begründeten Kulturgeschichte", in *Die Entfesselte Antike. Aby Warburg und die Geburt der Pathosformel*, ed. by Ulrich Rehm and Claudia Wedepohl (Köln: Walter König, 2012), pp. 33-50; Claudia Cieri-Via, *Introduzione a Aby Warburg* (Rome: Laterza, 2011), pp. 49-54; Georges Didi-Huberman, *L'image survivante: histoire de l'art et temps des fantômes selon Aby* Warburg (Paris: Éditions du Minuit, 2002), pp. 191-202; Pinotti, *Memorie del neutro: morfologia dell'immagine in Aby Warburg* (Milan: Mimesis, 2001), pp. 83-88; Giorgio Agamben, "Aby Warburg and the Nameless Science", in *Potentialities: Collected Essays in Philosophy*, ed. by Daniel Heller-Roazen (Stanford: Stanford University Press, 1999), pp. 89-103 (90); Kurt W. Forster, "Aby Warburg: His Study of Ritual and Art on Two Continents", *October*, 77 (1996), pp. 5-24; and Erwin Panofsky, *Meaning in the Visual Arts: Papers in and on Art History* (Garden City: Doubleday, 1955), p. 268.

(pathos) or of profoundest contemplation (ethos)", adding to both of these conditions a brief statement: "In need of intensification".[230] Yet, what does this all mean?

In 1942, thirteen years after Warburg's death, Ernst Cassirer was the first to analyse and interpret Warburg's concept of the *Pathosformel*. He was also certainly one of the most authoritative possible sources, as he spent eight years in the Kulturwissenschaftliche Bibliothek Warburg, in close contact with its founder. Cassirer, in *The Logic of the Cultural Sciences*, introduces the concept of *Pathosformel* by recognising the existence of a diffusion of certain forms throughout the history of art: "Each age takes over certain forms from its predecessor and hands them on to its successor".[231] He credits Warburg with having detected and investigated this diffusion, and argues that Warburg's cross-disciplinary approach enabled him to achieve excellent results.[232] Moreover, he points out that Warburg, focusing on Italian Renaissance art, identified the key aspect of image-making, taking into account "the particular nature and general tendency of the creative process in the fine arts".[233] In doing so, Warburg "sought to throw light on it from all angles, psychological as well as historical".[234]

But what does this creative process consist of, according to Warburg? It mainly involves drawing on certain "pregnant forms of expression", typical and recurrent situations, and solutions from ancient art.[235] It is in this sense that, according to Warburg, specific images come to life again.[236] The archetypal and fixed forms to which Warburg referred are the postures, gestures, movements, and emotions expressed in the static representation of human figures, the purpose of which is "to make psychic existence and psychic agitation visible".[237] Warburg, according to Cassirer, was convinced that these patterns are constituent of collective memory because they are recurrent in the images of the cultures of several historical periods

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[230] Gombrich, *Aby Warburg*, p. 179.
[231] Ernst Cassirer, *The Logic of the Cultural Sciences*, trans. by Steve G. Lofts (New Haven and London: Yale University Press, 2000), p. 117.
[232] Ibid.
[233] Ibid.
[234] Ibid.
[235] Ibid.
[236] Ibid., pp. 117-118.
[237] Ibid., p. 118.

and contexts.[238] In this way, Warburg founded a new methodological approach to the study of images.[239]

Gombrich went deeper than Cassirer into analysing the Warburgian concept of *Pathosformel*, not only by revealing the intellectual sources of this term but also by linking it to the works of art on which Warburg based his theory of images.[240] As Gombrich pointed out, specific iconographic figures in art history led Warburg to formulate his concept of *Pathosformel*—the nympha, above all.[241] For example, Warburg identified the 'source' for Domenico Ghirlandaio's Tornabuoni Chapel nympha (fig. 74): the classical figure of the maenad or Victoria (fig. 75); the congruence of the forms is difficult to dispute.[242] It is in this sense that "these classical formulae are used", that is, to add "an extra degree of expressiveness and 'pathos'" to the figure depicted.[243]

Another example of figures whose movements express tension and psychic agitation—in other words, another example of *Pathosformel*—is represented by "the soldiers who shrink back in terror from the apparition of the rising Christ", depicted in Ghirlandaio's *Resurrection* (fig. 76), a painting located in Santa Maria Novella.[244] The classical model of Ghirlandaio's painting appears clear to Warburg: "Their heads are adapted from sketches after Trajan's column which can be found in the sketchbook" (figs. 77–78).[245]

To Warburg, certain Renaissance figures appear charged by intense agitation and emotion, the representation of which comes directly from a careful study, by the artist, of antique representations of expressions of movement. Borrowing from linguistics, Warburg called these expressions "superlatives".[246] More specifically, Warburg borrowed the term "superlative" from Hermann Osthoff's lecture titled *Vom*

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[238] Ibid.
[239] Ibid.
[240] See Gombrich, *Aby Warburg*, pp. 177-185.
[241] Ibid., p. 177.
[242] Ibid., p. 179.
[243] Ibid.
[244] Ibid., p. 180.
[245] Ibid., pp. 179-180.
[246] Ibid.

Suppletivwesen der indogermanischen Sprachen.[247] A passage by Warburg is indicative in this sense:

> The true object of their rivalry was the depiction of the intensified expression of mental or physical states, be it that of inward religious emotion or that of the gracefully adorned or crudely gesticulating human figure. I do not want to overrate the formula I have found for it, but there exists in the field of the visual arts a phenomenon which is the same as the one Osthoff has observed in linguistics—a switch and supplementation of the roots used in the superlative.[248]

Warburg proposes Ghirlandaio's *Massacre of the Innocents*, a scene from the Tornabuoni frescoes (fig. 79), as an example of the use of "superlatives" in the visual arts.[249] In fact, he argues, the expressive charge of the figures in the foreground comes directly from a Roman triumphal relief in the Arch of Constantine (fig. 80). The proof that Ghirlandaio knew the reliefs of the Arch of Constantine resides in the bas-reliefs painted in the background of Ghirlandaio's *Sacrifice of Zacharias* (fig. 81), located in the same fresco cycle.[250]

Clearly, Warburg's attention was focused on the idea that the representation of human movement of every kind—such as striding, running, dancing, seizing, bringing, and carrying—has an ancient root and expresses an inner emotion. This is confirmed in his writing:

> The unleashing of uninhibited expressive movements which occurred in particular in Asia Minor among the followers of Bacchic cults embraces the whole gamut of kinetic utterance of human nature in the grip of phobic experience ranging from helpless passive absorption to murderous frenzy and all the intervening movements belonging to the thiasotic cult such as striding, running, dancing, seizing, bringing, carrying. Wherever these are represented in works of art they convey the echoes of such surrender to the depths. The marks of the thiasotic mint are indeed an essential and uncanny characteristic of these expressive coinages which spoke, for instance, from ancient sarcophagi to the sensibility of Renaissance artists.[251]

Warburg's interest in all sorts of movement is evident in many of his works, starting from his dissertation on Botticelli, completed in 1893, in which he announces his main project thusly:

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[247] Ibid., p. 178.
[248] Ibid., pp. 178-179.
[249] Ibid., p. 180.
[250] Ibid.
[251] Ibid., p. 246.

It is possible to trace, step by step, how the artists and their advisers recognised 'the antique' as a model that demanded an intensification of outward movement, and how they turned to antique sources whenever accessory forms—those of garments and of hair—were to be represented in motion.[252]

Also in this early study, a first definition of *Pathosformel* emerges: "The tendency, shaped by what was then known of antiquity, to turn to the arts of the ancient world whenever life was to be embodied in outward motion".[253]

In Warburg's second study on Botticelli (1898), the concept of *Pathosformel* is described in these terms: "Expressing the whole cycle of human emotional life, from melancholy stillness to vehement agitation".[254] The emphasis on emotion is now clearer, and will become determinative in his subsequent research, such as in his 1907 essay *Francesco Sassetti's Last Injunction to his Sons*, where Warburg states:

Like Giuliano da Sangallo, Ghirlandaio is known to have kept an archaeological sketchbook; this was the source of the *emotive formulas* that infuse the prose of the Tornabuoni frescoes with the loftier style of an idealised antique rendering of motion. Once freed, the votaries of *antique emotive gesture* could no longer be kept discreetly at a distance (emphasis added).[255]

The term "emotive formulas" is notable here, as it refers to the representation of movements expressing emotion (specifically, those representations that have a classical origin). The same concept is expressed years later in his 1914 essay *The Emergence of the Antique as a Stylistic Ideal in Early Renaissance Painting*:

In an attempt to satisfy both tendencies, two workshops—those of the Pollaiuolo brothers and the Ghirlandaio brothers—adopted a composite style in which the distinction between the two stylistic principles was still clearly apprehensible. Here, through a series of specific examples, the author showed the emergence of the new *emotive formulas* of gesture (emphasis added).[256]

The study on the representation of expressive movements is also present in Warburg's last project, an "atlas of images" (*Bilderatlas*), published as *Der Bilderatlas*

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[252] Warburg, "Sandro Botticelli's *Birth of Venus* and *Spring*" (1893), in id., *The Renewal of Pagan Antiquity*, pp. 89-156 (89).

[253] Ibid., p. 108.

[254] Warburg, "Sandro Botticelli" (1898), in id., *The Renewal of Pagan Antiquity*, pp. 157-164 (157).

[255] Warburg, "Francesco Sassetti's *Last Injunctions to His Sons*" (1907), in id., *The Renewal of Pagan Antiquity*, pp. 223-262 (249).

[256] Warburg, "The Emergence of the Antique as a Stylistic Ideal in Early Renaissance Painting" (1914), in id., *The Renewal of Pagan Antiquity*, pp. 271-274 (271).

Mnemosyne (*The Mnemosyne Atlas*), and the concomitant, more narrowly conceived "Sequence of Images" (*Bilderreihen*).[257]

Hildebrand's theory of vision and Warburg's concept of *Pathosformel* can be expanded further. An interesting case is offered by the famous duck-rabbit image (fig. 82), which was analysed by Ernst Gombrich. Jastrow's duck-rabbit image can be seen either as a rabbit's head or as a duck's. Depending on where we shift our attention, we have different views of the same image.

In this sense, returning to our previous example about the observation of an unfinished statue representing a figure in movement—let's say, for instance, Michelangelo's *Slave* called *Atlas* (fig. 12)—the beholder faces at least three possibilities: (*i*) he or she may concentrate on the movement of the figure, as it seems to break free from the block of marble; (*ii*) he or she may focus on the rough surface, resulting from the chisel strokes; or (*iii*) he or she may contemplate the incomplete face of the figure. These are three different formulas (the movement, the chisel strokes, the unfinished face) that give rise to three different views, which must necessarily lead to three different responses.[258] All three responses at the same time are not possible, since the beholder can focus on only a single aspect of the work at a time, as the duck-rabbit image shows. Only afterwards can viewer report his or her perception in these terms: "It's an unfinished figure in movement".

Also Gombrich's idea of art as illusion can be interpreted in terms of visions to which beholders respond. Discussing the same duck-rabbit image, Gombrich states: "We can see the picture as either a rabbit or a duck. It is easy to discover both readings. It is less easy to describe what happens when we switch from one interpretation to the other".[259] Here Gombrich grasps the issue. It is precisely in the switch from the perception of a vision to the perception of another vision in the same image that the problem emerges: "The shape transforms itself in some subtle way when the duck's beak becomes the rabbit's ears and brings an otherwise neglected

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257 Warburg, *Der Bilderatlas Mnemosyne*, ed. by Martin Warnke and Claudia Brink (Berlin: Akademie Verlag, 2003).

258 For the first type of response, see Chapter 4; for the second type of response, see Chapter 5; for the third type of response, see Chapter 6.

259 Gombrich, *Art & Illusion*, p. 4.

spot into prominence as the rabbit's mouth".[260] As previously stated, we can see both visions but we cannot see both of them at the same time:

> we can switch from one reading to another with increasing rapidity; we will also "remember" the rabbit while we see the duck, but the more closely we watch ourselves, the more certainly will we discover that we cannot experience alternative readings at the same time.[261]

This idea may be corroborated by Kenneth Clark's description of his own aesthetic experience, felt during the observation of *Las Meninas* (fig. 83) by Diego Velázquez (1599–1660). After having introduced his aesthetic experience by stating that "one cannot look for long at *Las Meninas* without wanting to find out how it is done", he continues:

> I would start from as far away as I could, when the illusion was complete, and come gradually nearer, until suddenly what had been a hand, and a ribbon, and a piece of velvet, dissolved into a salad of beautiful brush strokes. I thought I might learn something if I could catch the moment at which this transformation took place, but it proved to be as elusive as the moment between waking and sleeping.[262]

As Gombrich points out, Clark "wanted to observe what went on when the brush strokes and dabs of pigment on the canvas transformed themselves into a vision of transfigured reality as he stepped back".[263] Gombrich additionally emphasises the fact that in "stepping backward and forward" Clark "could never hold both visions at the same time".[264] Clearly, in the passage quoted just above, Clark is talking about two distinct views (and appearances) of the same work. In this sense, his description exemplifies how the same image may give rise to different responses, and how the study of aesthetic response is key to our understanding of images. In fact, Gombrich concludes his analysis saying that "in Kenneth Clark's example, the issues of aesthetics and of psychology are subtly intertwined".[265]

Giovanni Dominici (1356/1357–1419) came to similar conclusions:

> I warn you, if you have paintings in your house for this purpose, beware of frames of gold and silver, lest they [your children] become more idolatrous than faithful, since, if they see more candles lit and more hats removed and more

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[260] Ibid., pp. 4-5.
[261] Ibid., p. 5.
[262] Kenneth Clark, *Looking at Pictures* (New York: Holt, Rinehart and Winston, 1960), pp. 36-37.
[263] Gombrich, *Art & Illusion*, p. 5.
[264] Ibid.
[265] Ibid.

kneeling to figures that are gilded and adorned with precious stones than to the old smoky ones, they will only learn to revere gold and jewels, and not the figures, or rather the truths represented by those figures.[266]

In saying that one should not focus on the materiality of the image—the gold and jewels—but on its representation, Dominici recognises that an image may have different views, and that each view leads to a different response. Regarding this same passage, Freedberg points out that "there could be no clearer way, then as today, of talking about the power of images than by making those necessary distinctions".[267]

2 The Ways of Empathy in Aesthetic Response

In the previous section, I explored the question of what it means to respond to an image. By way of this question, I found myself examining another question: what is the power of images? In defining the concept of the power of images, I stated that it is the result of the link between the beholder and the work of art observed. The subject of this section is precisely that link, which the nineteenth-century German movement of psychological aesthetics, *Kunstwissenschaft*, called *Einfühlung* (empathy).[268] The analysis of the phenomenon of empathy allows us to mark the distinction between aesthetic judgement and aesthetic experience (two possible approaches to art). Whereas the first approach is mainly determined by knowledge, reflection, and historical circumstances, the second is largely determined by nature. For this reason, in order to investigate the phenomenon of empathy in aesthetic response, we need to consider the brain-body system from a biological perspective.

In his *Prolegomena to a Psychology of Architecture* (1886), Heinrich Wölfflin gave particular importance to the role of the human body (and embodiment) in aesthetic response:

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[266] Giovanni Dominici, *Regola del governo di cura familiare*, ed. by Donato Salvi (Florence, 1860), pp. 132-133. Translated in Freedberg, *The Power of Images*, pp. 11-12.

[267] Freedberg, *The Power of Images*, p. 12.

[268] On the *Kunstwissenschaft*, which addressed the problem of empathy and felt emotions in art— and that includes writers such as Conrad Fiedler, Adolf Göller, Adolf Hildebrand, Theodor Lipps, August Schmarsow, Robert Vischer, Johannes Volkelt, and Heinrich Wölfflin—see Harry Francis Mallgrave and Eleftherios Ikonomou (eds), *Empathy, Form and Space. Problems in German Aesthetics 1873–1893* (Los Angeles: University of Chicago Press, 1994).

> *Physical forms possess a character only because we ourselves possess a body.* If we were purely visual beings, we would always be denied an aesthetic judgment of the physical world. But as human beings with a body that teaches us the nature of gravity, contraction, strength, and so on, we gather the experience that enables us to identify with the conditions of other forms.[269]

Mind, brain, and body—which are in turn placed in a social and historical context—are therefore the subjects of our investigation into empathy in aesthetic response.

2.1 Attention and Distraction in Benjamin

"Art demands concentration from the spectator".[270] With this statement, Benjamin touches on one of the most important aspects of both art making and art perception. Whereas during the process of art making the artist must take into account the fact that his or her work must capture the attention of the recipient, the observer fulfill his or her role only if (s)he commits to the contemplation of the work before him or her. This argument finds support in Xenophon's *Memorabilia* (c. 371 BC), which stresses the importance of the ability of the artist to create life-like statues.

> On another occasion he [Socrates] visited Cleiton the sculptor, and while conversing with him said:
> "Cleiton, that your statues of runners, wrestlers, boxers and fighters are beautiful I see and know. But how do you produce in them that illusion of life which is their most alluring charm to the beholder? Then isn't it by accurately representing the different parts of the body as they are affected by the pose—the flesh wrinkled or tense, the limbs compressed or outstretched, the muscles taut or loose —that you make them look more like real parts and more convincing?"
> "Yes, certainly".[271] (III, 10. 6-8)

The naturalism of the figures goes hand in hand with the ability of the observer to identify him- or herself with the sculptures observed, to the point of actually feeling the same muscular tension and pose.

In another crucial passage, Socrates links the realistic representation of the feelings, expressed with bodies in action, to the beholder's aesthetic enjoyment:

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[269] Heinrich Wölfflin, "Prolegomena to a Psychology of Architeture", in *Empathy, Form and Space*, pp. 149-190 (151).

[270] Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, p. 268.

[271] Xenophon, "Memorabilia", in id., *Memorabilia. Oeconomicus. Symposium. Apology*, trans. by Edgar Cardew Marchant (Cambridge, MA, London: Harvard University Press, 2013), pp. 1-359 (249).

"Doesn't the exact imitation of the feelings that affect bodies in action also produce a sense of satisfaction in the spectators?"
"Oh yes, presumably".
"Then must not the threatening look in the eyes of fighters be accurately represented, and the triumphant expression on the face of victors be imitated?"
"Most certainly".
"It follows, then, that the sculptor must represent in his figures the activities of the soul".[272] (III, 10. 8)

The beholder, to accomplish his or her aim—that is, to be engaged in an aesthetic contemplation—must be alone in front of the work of art in question, with the necessary circumstances that facilitate concentration (for instance, silence, good illumination, a pleasant environment, and, most necessarily, a mental state predisposed to attention), as indeed Benjamin points out: "Painting, by its nature, cannot provide an object of simultaneous collective reception".[273]

Attention is the indispensable precondition for an empathic response to art. Without attention there will be no empathy, but rather its opposite, detachment. Indeed, this last kind of response is the consequence of distraction. The difference between attention and distraction is usefully explained by Benjamin, who states: "A person who concentrates before a work of art is absorbed by it; he enters into the work".[274] Therefore, according to Benjamin, only in the act of attention can the beholder establish an empathic engagement with the work of art observed, whereas the opposite happens in distraction: "By contrast, the distracted masses absorb the work of art into themselves".[275] These two states, attention and distraction, determine the kind of relationship that will prevail between the work of art and its recipient. It is the direction of the absorption that indicates whether this relationship is empathetic or not. As Benjamin claimed, absorption plays an important role in this polarisation (i.e. attention/distraction). In the first case (attention), it is the work of art that absorbs the beholder; in the second (distraction), it is the beholder that absorbs the work.

In his *On the Optical Sense of Form: A Contribution to Aesthetics* (1873), Robert Vischer had already acknowledged the distinction between empathy and detachment (or apathy) when he stated that "by sensation I mean the sensory process only and,

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[272] Ibid.
[273] Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, p. 264.
[274] Ibid, p. 268.
[275] Ibid.

more particularly, the sensory response to an observed object. The first distinction to be made is between emphatic and unemphatic sensations. An image perceived unconsciously is unemphatic, vague, and indifferent".[276]

2.2   Vischer and Lipps: From *Einfühlung* to Empathy and "Feeling-into"

In 1873, Vischer was one of the first to theorise the notion of *Einfühlung* (literally, "feeling-in").[277] In 1908, Edward B. Titchener translated the German art historical term *Einfühlung* as "empathy".[278] In the same year, James Ward also suggested "empathy" as a translation of *Einfühlung*.[279] Subsequently, the term "empathy" became accepted by the academic community as the translation of *Einfühlung*, meaning the capacity of "feeling-into" observed forms, both in art and in nature.[280]

In commenting on a section of Albert Scherner's book *The Life of the Dream*, Vischer formulates his own definition of empathy as the projection of one's own bodily form into an object's form:

> Particularly valuable in an aesthetic sense is the section on *Die symbolische Grundformation für die Leibreize* (*Symbolic Basic Formation for Bodily Stimuli*). Here it was shown how the body, in responding to certain stimuli in dreams, objectifies itself in spatial forms. Thus it unconsciously projects its own bodily form—and with this also the soul—into the form of the object. From this I derived the notion that I call "empathy" [*Einfühlung*].[281]

Therefore, in empathy, the beholder extends him- or herself into the contemplated object. According to Vischer, to contemplate an object means to "mediate its size with my own, stretch and expand, bend and confine myself to it".[282]

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[276] Robert Vischer, "On the Optical Sense of Form: A Contribution to Aesthetics", in *Empathy, Form and Space*, pp. 89-123 (95).

[277] Ibid.

[278] See Edward B. Titchener, *Lectures on the Elementary Psychology of Feeling and Attention* (New York: MacMillan, 1908).

[279] See Susan Lanzoni, *Empathy: A History* (New Haven: Yale University Press, 2018), p. 9; and Lanzoni, "Empathy's Translations: Three Paths from *Einfühlung* into Anglo-American Psychology", in *Empathy: Epistemic Problems and Cultural-Historical Perspectives of a Cross-Disciplinary Concept*, pp. 287-315.

[280] See Lanzoni, *Empathy*, p. 9.

[281] Vischer, *On the Optical Sense of Form*, p. 92.

[282] Ibid., p. 104.

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However, the term *Einfühlung* originated with Arthur Schopenhauer and Johann Herder.[283] The contribution of Vischer, and his father Friedrich Theodor Vischer, was to bring the notion of *Einfühlung* into aesthetic discussion, in the 1870s.[284] Then, in *Empathy, Inner Imitation, and Sense-Feelings* (1903), Theodor Lipps adopted Robert Vischer's notion of *Einfühlung*. Lipps described *Einfühlung* as the projection of one's own self into the perceived figure, to the point of experiencing the movement performed by that figure:

> The *object* of my activity is not my own activity, which is different from the observed one, but only this activity which I behold. I feel active in the movement or in the moving figure, and through projecting myself into it I feel myself striving and performing this same movement.[285]

Another idea is that standing in a large space makes one feel expansive:

> In viewing a large hall I feel an inner "expansion", my heart "expands": I have this peculiar sense of what is happening within me. Connected with it are muscle-tensions, perhaps those involved in the expansion of the chest. To be sure, they do not exist for my consciousness, so long as my attention is directed to the spacious hall.[286]

One of the most important achievements in the study of *Einfühlung* response, or the ability to feel-into objects, is the concept of embodiment, that is, the way the observer's body is affected by the perceived object. From Vischer's passages it is possible to deduce a clear definition of embodiment, that is, a bodily sensation felt as a consequence of a visual experience fulfilled in a given context. To Vischer, the object is perceived not so much with the eyes but with the senses; in other words, it is perceived with a specific part of the body that corresponds to what one observes:

> We can often observe in ourselves the curious fact that a visual stimulus is experienced not so much with our eyes as with a different sense in another part of our body. When I cross a hot street in the glaring sun and put on a pair of dark blue glasses, I have the momentary impression that my skin is being cooled off. Similarly, we speak of "loud colours" because their shrillness does indeed induce an offensive sensation in our auditory nerves. In rooms with low ceilings our whole body feels the sensation of weight and pressure. Walls that have become crooked with age offend our basic sense of physical stability. The perception of exterior limits to a form can combine in some obscure way with the sensation of my own physical boundaries, which I feel on, or rather with, my own skin.[287]

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[283] See Lanzoni, *Empathy*, p. 32.
[284] Ibid.
[285] Lipps, "Empathy, Inner Imitation, and Sense-Feelings", in *A Modern Book of Aesthetics*, ed. by Melvin Rader (New York: Holt, Rinehart and Winston, 1979), pp. 374-382 (374-375).
[286] Ibid., p. 377.
[287] Vischer, *On the Optical Sense of Form*, p. 98.

Thus, according to Vischer, a person's experience of certain situations may elicit discordant responses from the body depending on the context. For instance, the response to a sunny view on a hot day through a pair of sunglasses (which produce a visual illusion) may correspond to a feeling of freshness in the body; in some instances, the vision of colours may affect the auditory nerves. However, other responses may be possible. Inside a restricted space, one may have a sensation of weight and pressure; inside a misshapen environment our physical stability could be compromised; the observation of the exterior limits of a form may have some implications for our sensations of our own bodily boundaries. Moreover, in a given space one can have the sense of stretching or expansion, smallness or largeness, and so on:

> With a small object, partially or totally confined and constricted, I very precisely concentrate my feeling. My feeling will be compressed and modest (a star, a flower—true reality: a tight belt—a contractive feeling). When, on the contrary, I see a large or partially over-proportioned form, I experience a feeling of mental grandeur and breadth, a freedom of will (a building, water, air—true reality: a loose cloak—an expansive feeling [*Ausfühlung*]. More specifically, the compressed or upward striving, the bent or broken impression of an object fills us with a corresponding mental feeling of oppression, depression, or aspiration, a submissive or shattered state of mind.[288]

In short, Vischer argues that in perception "the whole body is involved; the entire physical being is moved".[289]

Similar considerations are advanced by Friedrich Nietzsche in *Daybreak* (1881). Nietzsche examines the notion of sympathy as it relates to the phenomenon of inner imitation—that is, the sensation that often occurs when one observes someone else doing something:

> To understand another person, that is, *to imitate his feelings in ourselves*, we do indeed often go back to the *reason* for his feeling thus and thus and ask for example: *why* is he troubled?—so as then for the same reason to become troubled ourselves; but it is much more usual to omit to do this and instead to produce the feeling in ourselves after the *effects* it exerts and displays on the other person by imitating with our own body the expression of his eyes, his voice, his walk, his bearing (or even their reflection in word, picture, music). Then a similar feeling arises in us in consequence of an ancient association between movement and sensation, which has been trained to move backwards or forwards in either direction. We have brought our skill in understanding the feeling of others to a

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[288] Ibid., pp. 104-105.
[289] Ibid., p. 99.

high state of perfection and in the presence of another person we are always almost involuntarily practising this skill.[290] (II. 142)

Therefore, according to Nietzsche, what we call empathy may occur either consciously—that is, when we ask ourselves the reason for someone else's sadness— or unconsciously—when one does not wonder about others' emotive states but just feels them as a consequence of an (inward) imitative faculty that appears to be natural and automatic.

Bernard Berenson provided a similar theory of perception in aesthetics, arguing that painters must give "tactile values to retinal impressions", which means that to successfully see a painting,

> I must have the illusion of being able to touch a figure, I must have the illusion of varying muscular sensations inside my palm and fingers corresponding to the various projections of this figure, before I shall take it for granted as real, and let it affect me lastingly.[291]

In sum, for Berenson, to see a painting also means to feel it in one's own muscles. It is in conceiving this process of perception that Vischer, Lipps, Nietzsche, and Berenson introduced, without mentioning the term, the idea of embodied simulation, which has been developed recently in cognitive neuroscience.

2.3   Mirror Neurons and Embodied Simulation

Since the 1990s, embodied cognition has occupied scholars from different disciplines ranging from philosophy to cognitive neuroscience to artificial intelligence. In neuroscience, the notion of embodied cognition came to prominence with the work of Francisco Varela, Evan Thompson, and Eleanor Rosch.[292] The principal idea behind embodied cognition is that perception involves the motor system and reflects our body-based interactions with the environment.

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[290] Friedrich Wilhelm Nietzsche, *Daybreak*, trans. by R. J. Hollingdale, ed. by Maudemarie Clark and Brian Leiter (Cambridge: Cambridge University Press, 2019), p. 89.
[291] Bernard Berenson, *The Florentine Painters of the Renaissance* (New York: G. P. Putnam's Sons, 1896), pp. 4-5.
[292] See Francisco Varela, Evan Thompson and Eleanor Rosch, *The Embodied Mind: Cognitive Science and Human Experience* (Cambridge, MA: MIT Press, 1991).

From neuroscientific studies, it emerges that the whole-body expression of emotions regulates social interactions.[293] To perceive a bodily expression of an emotion means, most of the time, to react or to prepare to react to it. For this reason, the human ability to understand the meaning of the actions performed by others is the foundation of social life. As Beatrice de Gelder stated:

> The meaning of the action is what the agent has in mind when intending, planning, and performing the action…To understand an action means to understand it in relation to the intention of the agent in planning and performing that action.[294]

Humans continuously and automatically absorb a wide range of social signals including facial expressions, gaze signals, head movements, gestures, postures, body shape, whole-body movements, and the use of personal and shared space. At first, the brain processes these signals at an unconscious level, after which point the signals are consciously recognised and reflected on.[295] Empirical research has pointed to the brain's network of mirror neurons as the underlying neural basis for the production and perception of social signals. Functional magnetic resonance imaging (fMRI) studies indicate that mirror neuron activity is connected to the ability to represent others' goals by observing their motor actions.[296] Mirror neurons are increasingly thought to be relevant to the explanations of a number of other perceptual phenomena including perception of speech, music, and visual works of art, and this may shed light on a broad range of abilities and deficits, including empathy, altruism, emotion, theory of mind, imitation, and autism spectrum disorder.

Observation of an action, via activation of the brain's parietal and premotor cortices, triggers a representation of that action. This suggests that the mirror neuron system underlies observers' ability to understand the intentions and emotions of

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[293] See Beatrice de Gelder, *Emotions and the Body* (Oxford and New York: Oxford University Press, 2015).

[294] Ibid., p. 81.

[295] Ibid.

[296] See Gallese, "Bodily Selves in Relation: Embodied Simulation as Second-Person Perspective on Intersubjectivity", *Philosophical Transactions of the Royal Society B*, 369 (2014), pp. 1-10; Gallese, "Before and Below Theory of Mind: Embodied Simulation and the Neural Correlates of Social Cognition", *Philosophical Transactions of the Royal Society of London B*, 362 (2007), pp. 659-669; Gallese, Christian Keysers and Rizzolatti, "A Unifying View of the Basis of Social Cognition", *Trends in Cognitive Sciences*, 8 (2004), pp. 396-403; Rizzolatti et al., *Premotor Cortex and the Recognition of Motor Actions*; and Gallese et al., "Action Recognition in the Premotor Cortex", *Brain,* 119 (1996), pp. 593-609.

others. For this reason, mirror neurons play a core role in mediating human intentions, actions, and movements (executed, imagined, and perceived) and the relationship among them. This realisation has led to the formulation of several theories with mirror neurons as a foundational component: simulation, theory of mind, embodiment, and direct perception theories.

There are some iconic body postures and movements, most of which have also been depicted in the visual arts. For example, raised arms are often associated with grief and desperation. When a figure's arms are pointed skyward, we expect other body parts to be in specific configurations. This ability to predict—which is rooted in the concept of empathy—has a scientific foundation. Understanding empathy and intersubjectivity requires understanding that "highly developed animals have adapted to living in social groups with very complex patterns of social interactions and that they depend on these stable interaction patterns for survival".[297] Comprehending the meaning of other people's behaviour is a fundamental aspect of group communication. Our day-to-day observations mainly concern the actions and interactions of other people.[298] In fact, a relevant portion of daily life is spent watching, interpreting, and reacting to the motions and emotions of others.

The discovery of mirror neurons allowed scholars to understand the means by which humans can understand each other's minds. People understand the actions that they observe in others by activating the neural network of those actions themselves. In other words, human capacity for social interaction has its roots in the process in the brain by which people automatically mirror the actions of others. Vittorio Gallese explained this mirror mechanism in terms of motor simulation: "In many circumstances, we do not explicitly ascribe intentions to others; we simply detect them by means of motor simulation, that is, by activating part of the motor system without moving".[299] In observing (or imagining) a subject performing a goal-oriented

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[297] De Gelder, *Emotions and the Body*, p. 83.
[298] See John Barresi and Chris Moore, "Intentional Relations and Social Understanding", *Behavioral and Brain Sciences*, 19 (1996), pp. 107-121.
[299] Gallese, "Embodied Simulation. Its Bearing on Aesthetic Experience and the Dialogue Between Neuroscience and the Humanities", *Gestalt Theory*, 41 (2019), pp. 113-128 (115).

action, the observer inwardly simulates this action him- or herself. This is why, in these cases, Gallese speaks about embodied simulation:

> Witnessing someone expressing a given emotion (e.g. disgust) or undergoing a given sensation (e.g. touch, pain) recruits some of the visceromotor (e.g. anterior insula) and sensory-motor (e.g. SII, ventral premotor cortex) brain areas activated when one experiences the same emotion or sensation, respectively. Other cortical regions are exclusively recruited for one's own and not for others' emotions or are activated for one's own tactile sensation but are actually deactivated when observing someone else being touched. I proposed to qualify all these mirroring mechanisms as the expression of the same functional mechanism: embodied simulation.[300]

It is in this light that the ideas of Vischer, Lipps, Nietzsche, and Berenson assume a new and deeper meaning. As these thinkers predicted, the self and the other mirror one another. Moreover, as neuroscience shows, this mirroring relates directly to the ongoing emotional states of the observer: the motions and emotions observed in the subject or object (as in the case of works of art) act as stimuli that modify the beholder's corporeal and emotional states. In this regard, it remains to understand the extent to which the self and the other merge during an empathic engagement; this is the task of the next section.

2.4 Absorption and the Role of Self in Aesthetic Contemplation

Most of the nineteenth-century German philosophy and art history describe empathy as a consequence of the absorption of the observer in the object observed. In this process of absorption, a decisive role has been assigned to the self, whose distinction with the other would be, during active contemplation, annulled.

Arthur Schopenhauer thought that an agent involved in a visual contemplation of either a living being or inanimate object loses him- or herself entirely in the contemplated thing. He writes, "the person who is involved in this perception is no

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[300] Ibid. See also Gallese and Valentina Cuccio, "The Paradigmatic Body: Embodied Simulation, Intersubjectivity, the Bodily Self, and Language", in *Open MIND*, ed. by Thomas Metzinger and Jennifer M. Windt (Frankfurt am Main: MIND Group, 2015), pp. 1-23.

longer an individual, for in such perception the individual has lost himself".[301] Schopenhauer brings this concept to its extreme consequences by stating that

> it is as though the object alone existed without anyone to perceive it, and thus we are no longer able to separate the perceiver from the perception, but the two have become one, since the entire consciousness is filled and occupied by a single image of perception.[302]

Therefore, according to Schopenhauer, in perception, the perceiver disappears completely in the perceiving subject or object. At this point, the agent no longer exists as a singular entity but is absorbed in the perceived subject or object like water in a sponge or, better yet, like water in cement dust, in which the two substances are no longer discernible and separable. Years later, Schopenhauer's idea of contemplation was elaborated on by Theodor Lipps, who posits that "in empathy, therefore, I am not the real I, but am inwardly liberated from the latter, i.e., I am liberated from everything which I am apart from contemplation of the form. I am only this ideal, this contemplating I".[303] Similarly, Wilhelm Worringer, basing his aesthetic theory on Schopenhauer's and Lipps' idea of empathy, argues that the observation of naturalistic figures causes a form of loss of self, with consequent absorption of the beholder into the work of art.[304]

But is this true? If yes, does this mean that during contemplation, we lose the awareness that each of us has of his or her own body from the inside? We possess the natural ability to know, for instance, whether we are moving or not, without looking. This kind of non-visual knowledge of our bodily posture and movement is called proprioception.[305] As Gallagher posits, proprioception

> consists of non-conscious, physiological information that updates the motor system with respect to the body's posture and movement. Proprioceptive information (PI) is processed on the subpersonal, non-conscious physiological level that subtends and operates as the basis for proprioceptive *awareness* (PA), a self-referential, but normally pre-reflective, awareness of one's own body.[306]

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[301] Arthur Schopenhauer, *The World as Will and Representation*, trans. by E. F. J. Payne, 2 vols (New York: Dover Publications, 1969), I, p. 179.

[302] Ibid., pp. 178-179.

[303] Lipps, *Ästhetik: Psychologie des Schönen und der Kunst*, 2 vols (Hamburg and Leipzig: Voss, 1903–1906), I, p. 247. Translated in Worringer, *Abstraction and Empathy*, p. 34.

[304] See Worringer, *Abstraction and Empathy*, p. 34.

[305] See Shaun Gallagher, *How the Body Shapes the Mind* (Oxford: Oxford University Press, 2005), p. 43.

[306] Ibid., p. 73.

Following Schopenhauer's position means supporting the thesis that during contemplation we lose proprioception. But can this really be possible? In other words, how can I experience something—in this case, the other—if my I is lost?

According to Vischer, experiencing certain objects may lead to the objectification of the self, feeling (bodily) their structure, size, and so on:

> When I observe a stationary object, I can without difficulty place myself within its inner structure, at its center of gravity. I can think my way into it, mediate its size with my own, stretch and expand, bend and confine myself to it.[307]

Thus, Vischer's idea of empathy contrasts with that of Schopenhauer's, Lipps', and Worringer's. Whereas Vischer talks about the "experiencing self", that is, a self that is modified by the object observed but that remains distinct from it (and, in this case, proprioception remains an essential function), for Schopenhauer, who speaks about the loss of self, this modification is all-encompassing, so much so as to annul the self. In this sense, Vischer states: "Thus I project my own life into the lifeless form, just as I quite justifiably do with another living person. Only ostensibly do I keep my own identity although the object remains distinct".[308] In this passage, it emerges clearly that for Vischer, in empathy as well as in aesthetic experience, the self, though modified, remains distinct from the other.

Merleau-Ponty goes a step further when he states that the subject's experience of the other also involves an experience of the self:

> Descartes, and above all Kant, *freed* the subject or consciousness by establishing that I could not grasp anything as existing if I did not first experience myself as existing in the act of grasping; they revealed consciousness—the absolute certainty of myself for myself—as the condition without which there would be nothing at all and the act of unifying as the foundation of the unified.[309]

That means that, during contemplation, the self cannot dissolve into the perceiving subject, object or place, as Schopenhauer suggested, and that proprioception is an essential component during the experience of the other. Not only the self and the other are distinct in empathy, but, according to Merleau-Ponty, we are also able to distinguish our self from our own body:

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[307] Vischer, *On the Optical Sense of Form*, pp. 104-105.
[308] Ibid., p. 104.
[309] Merleau-Ponty, *Phenomenology of Perception*, p. lxxiii.

> As a meditating Ego, I can of course distinguish the world and things from myself, since I clearly do not exist in the manner of things. I must even separate myself from my body insofar as it is understood as a thing among things, or as a sum of physico-chemical processes.[310]

Thus, the distinction between the self and the other is an essential characteristic of perception, inasmuch as it is thanks to that distinction that each of us can feel the world in his or her self.

Quassim Cassam provides another important indication when he states that "for if the self is that which perceives, acts, and thinks, and perceiving, acting, and thinking must be understood in bodily terms, then the metaphysical lesson is obvious: the self is, first and foremost, an embodied self".[311] It follows that, if it is the embodied self who perceives, there cannot be any loss of self during contemplation. This idea finds confirmation also in neuroscientific research on intersubjectivity. Empirical evidence indicates that, during external contemplation, the neural network associated with self-recognition overlaps with regions that contain mirror neurons, which provide a link between the self and the other, enabling intersubjectivity and empathy.[312] As a consequence, mirror neurons function as bridges between the self and the other, indicating the pivotal role of the self in empathy and contemplation.

Since we cannot prescind from the experience of our self during the experience of the other, we should conceive the self as a flexible being. In 1988, Russell W. Belk formulated the concept of the extended self in the following terms: "The major categories of extended self [are our] body, internal processes, ideas, and experiences, and those persons, places, and things to which one feels attached. Of these categories, the last three appear to be the most clearly *extended*".[313] In outlining the concept of the extended self, Belk employs the concept of embodiment:

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[310] Ibid., p. lxxvi.

[311] Quassim Cassam, "The Embodied Self", in *The Oxford Handbook of the Self*, ed. by Shaun Gallagher (Oxford: Oxford University Press, 2011), pp. 139-157 (142).

[312] See Steven M. Platek et al., "Neural Substrates for Functionally Discriminating Self-Face from Personally Familiar Faces", *Human Brain Mapping*, 27 (2006), pp. 91-98; Lucina Q. Uddin et al., "Self-Face Recognition Activates a Frontoparietal 'Mirror' Network in the Right Hemisphere: An Event-Related fMRI Study", *Neuroimage*, 25 (2005), pp. 926-935; Motoaki Sugiura et al., "Cortical Mechanisms of Visual Self-Recognition", *Neuroimage*, 24 (2005), pp. 143-149; and Jean Decety and Jessica A. Sommerville, "Shared Representations between Self and Other: A Social Cognitive Neuroscience View", *Trends in Cognitive Sciences*, 7 (2003), pp. 527-533.

[313] Russell W. Belk, "Possessions and the Extended Self", *Journal of Consumer Research*, 15 (1988), pp. 139-168 (141).

> The self is seen as embodied (i.e. not merely thoughts) and that material things (i.e. objects in the noun categories) most clearly make up the extended self. Other people are both constituent of the self (i.e. levels of the aggregate self) and potentially "objects" that form part of the extended self.[314]

It is in this sense that we can also talk about the shared self, as Belk himself and Rosa Llamas argue in another study.[315]

"Where does the mind stop and the rest of the world begin?"[316] With this working question, Andy Clark and David J. Chalmers proposed the theory of the extended mind, considering the case of Otto, a person suffering from Alzheimer's disease. Otto carries with him a notebook as a memory aid, in which he annotates the information he needs. When he needs to retrieve his memories, he consults his notes. Clark and Chalmers describe Otto's notebook as the extension of his self, as it functions as a storehouse of memories like the brain does for a sound person:

> Most of us already accept that the self outstrips the boundaries of consciousness; my dispositional beliefs, for example, constitute in some deep sense part of who I am. If so, then these boundaries may also fall beyond the skin. The information in Otto's notebook, for example, is a central part of his identity as a cognitive agent. What this comes to is that Otto *himself* is best regarded as an extended system, a coupling of biological organism and external resources.[317]

Clark and Chalmers' notion of the extended mind is also considerably significant for unimpaired people. As Lanzoni points out, we continuously rely on various devices such as mobile phones, tablets, and laptop computers that function as our extended memories and mental aids.[318] In this regard, we can interpret the notions of the extended self and extended mind as a type of empathic relationship of a subject with an object (or another subject) that functions as a mental aid, in which the distinction between the self and the other remain crucial.

To summarise, Schopenhauer, Lipps, and Worringer thought that in empathy the self and the other become one, without any possibility of distinguishing the two entities. However, the distinction between the self and the other in empathy, I argue, is

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[314] Belk, "Extended Self in a Digital World", *Journal of Consumer Research*, 40 (2013), pp. 477-500 (478).
[315] See Belk and Rosa Llamas, "Shared Possessions/Shared Self", in *Identity and Consumption*, ed. by Ayalla Ruvio and Russell W. Belk (London: Routledge, 2012), pp. 265-272.
[316] Andy Clark and David J. Chalmers, "The Extended Mind", *Analysis*, 58 (1998), pp. 7-19 (7).
[317] Ibid., p. 18.
[318] Lanzoni, *Empathy*, p. 1.

determinant because it is the self that experiences the other—without it, there would be no experience. As phenomenological research and neuroscientific data indicate, the loss of self would consequently dissolve the empathic experience.

2.5   Shared Emotions

Pliny the Elder, in speaking about the excellent skills of the sculptor Pythagoras of Reggio, states that "at Syracuse there is his Lame Man, which actually makes people looking at it feel a pain from his ulcer in their own leg" (XXXIV, XIX. 59).[319] In saying that the vision of a statue representing a lame man—in particular, the observation of the ulcer of the sculpted figure—makes people feel the same pain that the figure would feel if alive, Pliny expresses *in nuce* the concepts of embodied simulation and shared emotions.

Centuries later, this same concept is expressed by Leon Battista Alberti, when, in *On Painting*, he states that the emotions represented in a work of art must move the beholder: "Then, an *historia* will stimulate the observers' hearts when men, who were idle, will display, to the highest degree, their own activity of the mind".[320] Then, in a crucial passage, Alberti expresses the concept of empathy with the following words: "It derives from Nature, in fact…that we cry with those who cry, we laugh with those who laugh, we grieve with those who suffer".[321] Thus, Alberti conceived the observer as a subject mirroring the emotions observed in the work of art. In developing this idea, Alberti points out that the inner emotions represented in a figure are understood by the observer through the movements of its body: "But these motions of the mind are known from movements of the body".[322] It is clear that, in order to understand those emotions, the beholder must establish, consciously or not, an empathic engagement with the work of art observed.

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[319] Pliny, *Natural History*, IX, pp. 170-172: "Syracusis autem claudicantem, cuius ulceris dolorem sentire etiam spectantes videntur". Translated in ibid., p. 171.

[320] Alberti, *Il nuovo De pictura di Leon Battista Alberti*, pp. 207-208: "Poi moverà l'istoria l'animo quando gli uomini ivi dipinti molto porgeranno suo proprio movimento d'animo". Translated in ibid.

[321] Ibid., p. 208: "Interviene da natura…che piagniamo con chi piange, e ridiamo con chi ride, e doglianci con chi si duole". Translated in ibid.

[322] Ibid.: "Ma questi movimenti d'animo si conoscono dai movimenti del corpo". Translated in ibid.

We find similar considerations, years later, in the *Meditations on the Life of Christ* (c. 1478), where we read: "Look at Him well, then, as He goes along bowed down by the cross and gasping aloud. Feel as much compassion for Him as you can, placed in such anguish, in renewed derision" (LXXVII. 45-48).[323] This passage instructs the devotee about how to contemplate the figure of Christ, that is, to imagine his pain in order to feel it in his or her own body, in other words, the passage recommends the faithful to identify him- or herself with Christ, to empathise with him.

A series of neuroscientific studies seem to confirm the above mentioned statements, showing the mechanism involved in the beholder's brain-body system during both the experience and observation of pain. Ralph Adolphs, for instance, showed that emotion recognition from facial expressions activates diverse neural structures.[324] At first, the processing of faces activates cortices in occipital and temporal lobes, devoted to the recognition of facial features. Further recognition involves the activity of the amygdala and orbitofrontal cortex, which links the perceptual representation of faces to the recognition of the signalled emotions. In this way, the brain-body system of the observer reacts as if (s)he were in the situation contemplated.

The fMRI study on shared feelings carried out by Daren C. Jackson and colleagues, which investigated the neural activity involved during the perception of others' pain, offers a different way to address the process involved in empathy.[325] The results show that the perception of painful situations in others is associated with

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[323] Giovanni de Cauli (attributed), *Meditaciones vite Christi*, ed. by C. Mary Stallings-Taney (Turnhout: Brepols, 1997), p. 269: "Cerne igitur eum bene quomodo uadit curuus subtus crucem et uehementer anelat. Compatere igitur ei et tu, quantum potes, in tot angustiis et ludibriorum renouacionibus posito". Translated in de Cauli (attributed), *Meditations on the Life of Christ*, trans. by Isa Ragusa, ed. by Isa Ragusa and Rosalie B. Green (Princeton, NJ: Princeton University Press, 1961), p. 331.

[324] See Ralph Adolphs, "Recognizing Emotion From Facial Expressions: Psychological and Neurological Mechanisms", *Behavioral and Cognitive Neuroscience Reviews*, 1 (2002), pp. 21-61. For more on the correlation between facial expressions and emotions, see Lara Maister, Eleni Tsiakkas and Manos Tsakiris, "I Feel Your Fear: Shared Touch Between Faces Facilitates Recognition of Fearful Facial Expressions", *Emotion*, 13 (2013), pp, 7-13; Paul Ekman, *Emotions Revealed: Recognizing Faces and Feelings to Improve Communication and Emotional Life* (London: Weidenfeld and Nicolson, 2003); Ekman, *Emotion in the Human Face* (Cambridge: Cambridge University Press, 1982); and Ekman and Wallace V. Friesen, *Unmasking the Face. A Guide to Recognizing Emotions from Facial Clues* (Englewood Cliffs and London: Prentice-Hall, 1975).

[325] See Daren C. Jackson, et al., "Suppression and Enhancement of Emotional Responses to Unpleasant Pictures", *Psychophysiology*, 37 (2000), pp. 515-522.

significant bilateral changes in activity in several regions: the anterior cingulate, anterior insula, cerebellum, and, to a lesser extent, the thalamus. Significantly, the activity in the anterior cingulate seems to be correlated with the subject's ratings of the pain of others, indicating that this brain area's response is modulated according to individuals' reactivity to others' pain. This suggests that there is a partial cerebral commonality between perceiving pain in others and experiencing it first-hand.

These results were deepened in a similar functional imaging experiment by Tania Singer and colleagues.[326] Their study assessed brain activity while experiencing pain and compared it to that elicited during a situation in which a beloved one was experiencing a similar pain stimulus. Specific brain areas were activated in both situations: the bilateral anterior insula, rostral anterior cingulate cortex, brainstem, and cerebellum. On the basis of these data, Singer and coworkers argue that the activity in the anterior insula and rostral anterior cingulate cortex constitutes the neural basis for our understanding of the feelings of both ourselves and others.

The aforementioned outcomes were confirmed in the study of Philip L. Jackson and his team, which focused on seeing others in potentially painful situations.[327] The data show that observing others in pain-inducing situations triggers a specific part of a neural network known to be involved in self-pain processing. This neural reaction can be described in terms of an "as-if" response and, therefore, can be considered a form of empathic engagement between two subjects (or between subject and image).

An important achievement in the realm of emotion perception is the neurological description of emotional contagion, that is, the feeling of an emotional state resulting from the observation of another subject's state.[328] In other words, it is a form of transmission of emotions from one subject to another. This form of empathic engagement refers to a situation in which an individual experiences a similar

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[326] See Tania Singer et al., "Empathy for Pain Involves the Affective but not Sensory Components of Pain", *Science*, 303 (2004), pp. 1157-1162.

[327] See Philip L. Jackson, Andrew N. Meltzoff and Decety, "How Do We Perceive the Pain of Others? A Window Into the Neural Processes Involved in Empathy", *NeuroImage*, 24 (2005), pp. 771-779.

[328] For more on emotional contagion, see Stephanie D. Preston and Frans B. M. De Waal, "Empathy: Its Ultimate and Proximate Bases", <http://www.cogprints.org/1042/1/ preston_de_waal.html, 2000> [accessed 22 October 2019]. See also Preston and De Waal, "Empathy: Its Ultimate and Proximate Bases", *Behavioral and Brain Sciences*, 25 (2002), pp. 1-72.

emotional state to another individual as a result of the perception of that individual's situation. In this sense, empathy implies the understanding of the observed subject's state by activating one's own representation of that subject's state.

These studies indicate that the human faculty to experience the feelings of others, both in real life and in visual images, is characteristic of empathy.[329] Nevertheless would be a mistake to believe that there is a brain area or network specifically associated with empathy. As Jean Decety and Philip L. Jackson argue, there is not a "unitary empathy system (or module) in the brain. Rather, we consider multiple dissociable systems to be involved in the experience of empathy".[330]

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[329] For the neuroaesthetic studies on the emotional responses to works of art, see, for instance, Freedberg, *From Absorption to Judgment*; Freedberg, *Feelings on Faces*; Freedberg, *Memory in Art*; Freedberg, *Movement, Embodiment, Emotion*; Freedberg, *Choirs of Praise*; Freedberg, *Immagini e risposta emotiva*; Gallese and Freedberg, *Mirror and Canonical Neurons are Crucial Elements in Esthetic Response*; and Freedberg and Gallese, *Motion, Emotion and Empathy in Aesthetic Experience*.

[330] Decety and Jackson, "The Functional Architecture of Human Empathy", *Behavioral Cognitive Neuroscience Review*, 3 (2004), pp. 71-100 (86).

CHAPTER FOUR

Aesthetic Responses to the Representation of Goal-Directed Movement: Embodied Simulation, Predictive Perception, and Mental Completion

This chapter addresses the problem of the representation and perception of movement in static works of art and introduces the role played by imagination during aesthetic response. It does so by analysing the work of Gotthold Ephraim Lessing (1729–1781) and Sigmund Freud (1856–1939) in light of recent neuroscientific research on action perception.

It is divided into five sections. The first introduces the topic by focusing on the concept of "life-enhancing" coined by Bernard Berenson (1865–1959). With this descriptor, Berenson intended a particular effect of the relationship between the ways in which Renaissance artists depicted movement and people's capacity to feel the effects of that movement in their own muscles.

The second examines Lessing's aesthetic treatise *Laocoön: An Essay on the Limits of Painting and Poetry* (1767), where in the course of a wide-ranging discussion of the relationship between the visual arts (sculpture in particular) and poetry, he assigned a critical role to imagination in aesthetic response.

The third and fourth sections analyse the aesthetics of Freud, who, in dealing with sculpture, emphasised the importance of the beholder's imagination during the contemplation of human figures the posture of which suggests movement to the viewer. Under examination are two of Freud's texts: *Delusions and Dreams in Jensen's "Gradiva"* (1907) and *The Moses of Michelangelo* (1914), which deal with a Roman bas-relief and a Renaissance statue, respectively. These writings engage with artworks that represent meaningful moments in time: depictions of people and their gestures, mid-movement. These moments, conveyed by the artists through the

gestures of their figures, activate the beholder's imagination, which, in turn, enables a mental re-construction of the action and a visceral understanding of the image.

1 Aesthetic Experience and the Concept of "Life-Enhancing"

One of the main topics that this research addresses is the role of imagination and mental imagery during aesthetic response. This aspect will help us to answer our working-question, that is, how do beholders respond to unfinished works of art? The analysis of some of the cases in which the beholder's imagination and mental imagery is requested, in order to make sense of the figure observed, will shed some light in this sense. One of these cases is the representation of and response to movement in still works of art.

What happens when, during the contemplation of a marble sculpture representing a human figure performing a movement, the beholder focuses on the posture expressing that specific action? This is, in broad terms, the question addressed by both Gotthold Ephraim Lessing and Sigmund Freud in their respective treatises on sculpture.[331] Lessing, in *Laocoön: An Essay on the Limits of Painting and Poetry*, and Freud, in *Delusions and Dreams in Jensen's "Gradiva"* and *The Moses of Michelangelo*, take into consideration three different scenarios, all suggesting the critical role played by the beholder's imagination during aesthetic response.

One of the first art historians to understand the importance of the representation of movement in art was Aby Warburg, who stated that "the most difficult problem of all in the visual arts is that of capturing still images of life in motion".[332] Focusing on this same issue, Bernard Berenson, in sections seven and eight of *The Florentine Painters*

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[331] See Gotthold Ephraim Lessing, *Laocoön: An Essay on the Limits of Painting and Poetry*, trans. by Edward Allen McCormick (Baltimore and London: Johns Hopkins University Press, 1984); Sigmund Freud, "Delusions and Dreams in Jensen's *Gradiva*" (1907), in id., *The Standard Edition of the Complete Psychological Works of Sigmund Freud: Jensen's "Gradiva" and Other Works (1906–1908)*, ed. and trans. by James Strachey, 24 vols (London: Vintage Books, The Hogarth Press and the Institute of Psychoanalysis, 2001), IX, pp. 7-95; Freud, "The Moses of Michelangelo" (1914), in id., *The Standard Edition of the Complete Psychological Works of Sigmund Freud:* Totem and Taboo *and Other Works (1913–1914)*, ed. and trans. by James Strachey, 24 vols (London: Vintage Books, The Hogarth Press and the Institute of Psychoanalysis, 2001), XIII, pp. 207-238.

[332] Warburg, *Werke in einem Band*, p. 107: "Das schwierigste Problem für die bildende Kunst, lenkt das Festhalten der Bilder des bewegten Lebens".

of the Renaissance (1896), coined the descriptor of "life-enhancing", that is, a sense of muscular emulation and power that viewers feel when beholding human bodies expressing a great strength through their body constitution.[333] In doing so, Berenson paid tribute to William James, who, a few years earlier, wrote:

> Try to feel as if you were crooking your finger, whilst keeping it straight. In a minute it will fairly tingle with the imaginary change of position; yet it will not sensibly move, because *its not really moving* is also a part of what you have in mind. Drop *this* idea, think of the movement purely and simply, with all breaks off; and, presto! it takes place with no effort at all.[334]

At the base of Berenson's concept of life-enhancing there are three works by Antonio del Pollaiuolo: an engraving titled *Battle of the Nudes* (fig. 84), dated 1465–1475; *Hercules Slaying Antaeus*, the title describing a scene that Pollaiuolo realised in both a painting and a bronze sculpture, both dated c. 1475; and *David* (c. 1472), a painting. In analysing these works, Berenson is interested in "the way Pollaiuolo rendered movement".[335] Referring to the *Battle of the Nudes*, he states, "we imagine ourself imitating all the movements, and exerting the force required for them".[336] Therefore, for Berenson, as for Lessing before and Freud and Gombrich later on, the beholder's imagination plays an important role in art perception or, more precisely, in the visceral responses to images. In fact, without the beholder's kinesthetic imagery—in other words, without the observer's capacity to feel the work in his or her body—the artist's efforts to render movement in the figures would be in vain. The similarities between the James passage mentioned above and Berenson's concept of life-enhancing are now clearer.[337] Both stress the primacy of feeling over seeing, pointing to the sense of inner imitation in both (suggested) movement perception and movement imagination and citing the crucial role played by motor imagery in each case.

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[333] Berenson, *The Florentine Painters of the Renaissance*, p. 45.
[334] William James, *The Principles of Psychology*, 2 vols (New York: Henry Holt and Company, 1918), II, p. 527.
[335] Berenson, *The Florentine Painters of the Renaissance*, p. 53.
[336] Ibid., p. 55.
[337] In this regard, in James' review of Berenson's *The Florentine Painters of the Renaissance*, published in the journal *Science*, we read: "This little handbook, by an accomplished student of art history, deserves notice in these pages because it is the first attempt we have seen to apply elementary psychological categories to the interpretation of higher works of art. A painting, says the author, is of only two dimensions and yet must suggest the third dimension to the spectator's mind. The artist to do this, must give *tactile values* to retinal impressions". See James, "*The Florentine Painters of the Renaissance*, by Bernard Berenson (1896)", in id., *Essays, Comments, and Reviews* (Cambridge, MA, and London: Harvard University Press, 1987), pp. 523-524 (523).

There is one passage in particular in which the meaning of "life-enhancing" emerges clearly. In dealing with one of the tasks of the Renaissance artist, and referring to the representation of wrestlers, Berenson states:

> What a pleasure to be able to realise in my own muscles, on my own chest, with my own arms and legs, the life that is in him [the wrestler] as he is making his supreme effort! What a pleasure, as I look away from the representation, to realise in the same manner, how after the contest his muscles will relax, and rest trickle like a refreshing stream through his nerves![338]

Berenson, in this extract, is referring to the embodied simulation that often occurs during the perception of determinate forms—such as the representation of muscles in tension or gestures suggesting movement—that activate, as neuroscientific evidence suggests, brain-body processes in the beholder, thus enabling an empathic engagement between the observer and the work of art observed. It is precisely these brain-body processes that, according to Berenson, are the source of the beholder's aesthetic enjoyment: "All this I shall be made to enjoy by the artist who, in representing any one movement, can give me the logical sequence of visible strain and pressure in the parts and muscle".[339]

In more recent times, Lessing's and Freud's ideas of the ways a beholder may experience works of art seem to find resonance in Ernst Gombrich's concept of "the beholder's share" and David Freedberg's notion of "the power of images".[340] In these two theories we find the roots of the following idea: most works of art have a force (according to Gombrich it is a visual illusion that the observer must mentally resolve; according to Freedberg it is a power that acts emotionally on the observer) that, as neuroscientific data show, activates specific body-brain processes in beholders, imagination being one of them.

In commenting on a detail of the Pompeiian mosaic copy of the original Greek representation of the Battle of Alexander and Darius (fig. 85), dated c. 100 BC, Gombrich states:

> The bold foreshortening of the foreground figures, the fallen Persian whose face is reflected in the shield, all draw us into the scene. We are forced to sort out the

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[338] Berenson, *The Florentine Painters of the Renaissance*, p. 52.
[339] Ibid.
[340] See Gombrich, *Art & Illusion*; and Freedberg, *The Power of Images*.

puzzling shapes to build up the image of events in our mind, and in thus lingering on the situation we come to share the experience of those involved.[341]

This passage contains three important ideas. First, it states that specific elements in an image may lead the beholder to immersion ("all draw us into the scene"). Second, it asserts that images need the active participation of the viewer ("we are forced to sort out…"). To function, they need the beholder or, better yet, the beholder's imagination, to reconstruct the scene via an internal representation ("to build up the image of events in our mind"). Third, it holds that, in doing so, the beholder experiences the image "as if" (s)he were participating in the scene, thus establishing an empathic engagement with the work of art observed ("to share the experience of those involved"). Following Gombrich's reasoning, it is clear that in art contemplation, the beholder's imagination plays a crucial role:

> I believe that the one response cannot be separated from the other. Once we are "set" for this kind of appeal to our imagination, we will try to look through the picture into the imagined space and the imagined minds behind its surface.[342]

Therefore, the beholder's aesthetic perception may involve both material images and mental images. The latter being generated by the former, they are in a dialectical relationship. It is in this polarity, I argue, that most of the time dwells the aesthetic experience.

Similarly, the scenes depicted in the ancient Greek group of statues *Laocoön and His Sons* (fig. 86), the Roman bas-relief of *Gradiva* (fig. 87) and the sculpted figure *Moses* (fig. 88), dated c. 1513–1515, analysed in the three treatises by Lessing and Freud, are the "freeze frames" of longer actions. Imagination—and memory, as we shall see—is the faculty that enables the beholder to realise that the gesture depicted in a static work of art is a segment of a longer action. Put another way, the beholder's imagination begins and completes the frozen movement of the figure, overcoming a lacuna that is unavoidable in static works of art: time. Time is what enables an action to be performed, to have a beginning and an end, that is to say, to have a duration. The task of both the artist and the beholder is to solve this problem—the problem of the representation and perception of movement in static artworks. The former contributes

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[341] Gombrich, *Art & Illusion*, p. 116.
[342] Ibid.

to the solution by representing gestures with naturalness, suggesting dynamism, while the latter contributes by imagining the actual movement. The dialectical relationship between the representation of human figures in a way that suggests dynamism and the role of the beholder's imagination in perception has found new consideration in recent neuroscientific and neuroaesthetic research, paving the way for novel investigations.

2 Lessing and the Limits of Painting and Poetry

In his *Laocoön*, Lessing investigates the relationship between the formal appearances of figures and the effects (or illusions) that those appearances provoke in the observer, in terms of prediction and imagination. In the third chapter of the *Laocoön*, Lessing observes that the visual arts are limited by their own materiality: "The single moment of time to which art must confine itself by virtue of its material limitations".[343] This limit in its turn affects the artist, so that his creativity is confined within the choice of one single moment only, selected from a sequence of an entire scene to be represented: "The artist can never make use of more than a single moment in ever-changing nature, and…the painter in particular can use this moment only with reference to a single vantage point".[344] From this issue derives the difficulty of the artist's task: "It is evident that this single moment and the point from which it is viewed cannot be chosen with too great a regard for its effect. But only that which gives free rein to the imagination is effective".[345]

Thus, Lessing attributes a considerable role to the beholder's imagination, as it is confirmed in the following passage: "The more we see, the more we must be able to imagine. And the more we add in our imaginations, the more we must think we see".[346] For example, Lessing argues, "if Laocoön sighs, the imagination can hear him cry out".[347] Precisely here resides the importance to capture, in a scene, a moment pregnant with meaning. In this regard, a further task of the artist, we may suppose, is

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[343] Lessing, *Laocoön*, p. 19.
[344] Ibid.
[345] Ibid.
[346] Ibid.
[347] Ibid., p. 20.

that (s)he must know the various human emotions and their manifestations and to be able to depict them correctly, in order to make them recognisable to the spectators. It is in this sense that beholders are able to empathise with the figure observed and imagine, for instance, the sound of Laocoön's crying.

This is why Lessing states that "the works of both painter and sculptor are created not merely to be given a glance but to be contemplated—contemplated repeatedly and at length".[348] The length of the beholder's concentration is an important aspect in art perception. However, a prolonged contemplation may have negative consequences, since it can transform, in the beholder's mind, the expression represented in the figures:

> La Mettrie, who had himself portrayed in painting and engraving as a second Democritus, seems to be laughing only on the first few times we look at him. Look at him more often and the philosopher turns into a fop. His laugh becomes a grin. The same holds true for screaming. The violent pain which extorts the scream either soon subsides or else destroys the sufferer.[349]

If, on one hand, the impossibility to represent a scene in its entirety can lead to unwanted results, as in the portrait of La Mettrie, on the other, precisely this same impossibility offers the artist a great advantage, that is, to activate the beholder's imagination, as in the case of the representation of Medea by Timomachus. Lessing describes the precise moment in which Timomachus selected from Medea's action, namely, not the moment when she is killing her children, but slightly before (fig. 89). This choice coincides with the desire to leave to the spectator's mind the space to anticipate, or predict, the subsequent gesture of Medea:

> Among the ancient painters, Timomachus seems to have been the one most fond of subjects that display extreme passion. His raving Ajax and his infanticide Medea were famous paintings, but from the descriptions we have of them it is clear that he thoroughly understood and was able to combine two things: that point or moment which the beholder not so much sees as adds in his imagination, and that appearance which does not seem so transitory as to become displeasing through its perpetuation in art. Timomachus did not represent Medea at the moment when she was actually murdering her children, but a few moments before, when a mother's love was still struggling with her vengefulness. We can foresee the outcome of this struggle; we tremble in anticipation of seeing Medea as simply cruel, and our imagination takes us far beyond what the painter could have shown us in this terrible moment. But for this very reason we are not

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[348] Ibid., p. 19.
[349] Ibid., p. 20.

offended at Medea's perpetual indecision, as it is represented in art, but wish it could have remained that way in reality.[350]

In the nineteenth chapter of the *Laocoön*, Lessing deepens the role that imagination plays in aesthetic response. He does so by exploring the differences between a scene described in poetry and the same scene represented in a painting or sculpture, thus comparing the activity of the poet (epitomised by Homer) with that of the artist. He notes that whereas Homer's narration could not well be combined into a single picture, "the artist…cannot make use of more than one single moment at one time: either the moment of accusation, or the examination of witnesses, or the passing of judgment, or any other moment before, after, or between these points which he deems most suitable".[351] Nevertheless, the artist can give to that single moment all the power that a single poetry does not possess: "He [the artist] makes this single moment as suggestive as possible and describes it with all the illusion which makes art superior to poetry in the portrayal of visible objects".[352]

The poet, for his part, can represent what the artist cannot, namely the entire sequence of the scene:

> Being infinitely surpassed in this respect, what remains for the poet who wants to paint the same subject in words with any degree of success, but to avail himself likewise of his own peculiar advantages? And what are these advantages? The liberty to extend his description over that which preceded and that which followed the single moment represented in the work of art; and the power of showing not only what the artist shows, but also that which the artist must leave to the imagination.[353]

What is worth stressing in this passage is Lessing's identification of two opposite levels present in each visual image: one level that refers to what is depicted in the image and the other that refers to what the image leaves to the beholder, in other words, what the beholder's mind adds to the image—for example, the imagination of sound, noise, action, and so on. Therefore, what the beholder receives from an image comes from both the image itself and his or her own mental imagery. For Lessing it is exactly here that resides the advantage of the painter over the poet, in his or her faculty to leave something to the spectator.

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[350] Ibid., pp. 20-21.
[351] Ibid., p. 99.
[352] Ibid.
[353] Ibid.

3   Freud on *Gradiva*: Dream, Imagination, and the Unconscious Memory

Some of the insights on aesthetic experience contained in *Laocoön: An Essay on the Limits of Painting and Poetry* are directly connected to *Delusions and Dreams in Jensen's "Gradiva"* and *The Moses of Michelangelo*. One of Lessing's and Freud's most important achievements in aesthetics is the crucial role they assigned to imagination (and memory) in art perception.[354] Freud did this in the course of analysing two sculptures, *Gradiva* and Michelangelo's *Moses*, and the psychological responses their respective postures arouse in their viewers.

Wilhelm Jensen's 1903 novel *Gradiva* was the lens through which Freud examined the (real) Roman bas-relief by that name. The narrative revolves around the unusual attention that an archeologist devotes to a Roman bas-relief representing a walking female figure, Gradiva:

> The sculpture represented a fully-grown girl stepping along, with her flowing dress a little pulled up so as to reveal her sandalled feet. One foot rested squarely on the ground; the other, lifted from the ground in the act of following after, touched it only with the tips of the toes, while the sole and heel rose almost perpendicularly.[355]

In his critical reading, Freud's focus is not on the figure as such, but specifically on the posture of the Gradiva's feet, which suggests movement (fig. 90).[356] Therefore, in the bas-relief, an action is taking place, the action of walking. It is precisely the dynamism of the sculpted figure that catches the attention of the protagonist of the story, Dr. Norbert Hanold, a Lecturer in Archeology. In this sense, "the interest taken by the hero of the story in this relief is the basic psychological fact in the narrative".[357]

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[354] For a complete list of Freud's writings dealing with art, literature or the theory of aesthetics, see Freud, "Appendix: List of Writings by Freud Dealing Mainly or Largely with Art, Literature or the Theory of Aesthetics", in id., *The Standard Edition of the Complete Psychological Works of Sigmund Freud:* The Future of an Illusion*, Civilization and its Discontents *and Other Works (1927–1931)*, ed. and trans. by James Strachey, 24 vols (London: Vintage Books, The Hogarth Press and the Institute of Psychoanalysis, 2001), XXI, pp. 213-214.

[355] Freud, *Delusions and Dreams in Jensen's* Gradiva, p. 10.

[356] For more on the Nymph, see Didi-Huberman, *Ninfa dolorosa. Essai sur la mémoire d'un geste* (Paris: Gallimard, 2019); Didi-Huberman, *Ninfa profunda. Essai sur le drapé-tourmente* (Paris: Gallimard, 2017); Didi-Huberman, *Ninfa fluida. Essai sur le drapé-désir* (Paris: Gallimard, 2015); and Didi-Huberman, *Ninfa moderna. Essai sur le drapé tombé* (Paris: Gallimard, 2002).

[357] Freud, *Delusions and Dreams in Jensen's* Gradiva, p. 11.

Notably, Jensen's protagonist, "did not in fact find in the relief anything calling for special notice from the point of view of his branch of science".[358] Said otherwise, Hanold was not interested in the sculpture from an archeological point of view. He was instead captivated by the life-like manner in which the figure was depicted and the naturalness of her gait, as though it were captured "from the life".[359] As it were, he felt the presence of the marble figure he was beholding. This is why he gave the girl the name Gradiva, which means, "the girl who steps along".[360]

Hanold's contemplation of Gradiva spurs his imagination and his dreams;[361] these dreams are the primary focus of Jensen's book, and they are analysed by Freud from a psychoanalytical perspective: "What we really intended to do originally was only to investigate two or three dreams that are to be found here and there in *Gradiva* with the help of certain analytic methods".[362] Hanold dreams himself facing a living woman, rather than a marble sculpture. This is due to the realism of the sculpted figure, realism that, Freud observes, dwells "not only in the peculiarity of the posture of the foot as it steps along but in every detail of facial structure and bodily attitude", such that "the young man is able to take the physical appearance of that person to be the sculpture come to life".[363] The power, in the Freedbergian sense, that Gradiva has over Hanold is such that it makes him vividly imagine a real woman in different occasions:

> He [Jensen] makes the young man meet the living woman precisely in Pompeii; for the dead woman had been placed there only by his imagination, and the journey to Pompeii had in fact carried him away from the living woman, whom he had just seen in the street of the town in which he lived.[364]

However, it would be too simplistic to think that imagination is the only faculty involved in this kind of (aesthetic) experience. Freud's psychoanalytical analysis of Jensen's storytelling points to a link between imagination and memory in aesthetic response, inasmuch as the sculpted figure—and, more precisely, her feet and the way

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[358] Ibid.
[359] Ibid.
[360] Ibid.
[361] In this regard, it is worth stressing that both imagination and dream deal with mental imagery. See Andy Clark, *Surfing Uncertainty: Prediction, Action and the Embodied Mind* (Oxford: Oxford University Press, 2016), pp. 93-102.
[362] Freud, *Delusions and Dreams in Jensen's* Gradiva, p. 11.
[363] Ibid., pp. 41-42.
[364] Ibid., p. 42.

they are placed—awakens not only Hanold's imagination but also his earlier memories. Gradiva triggers for Hanold a distant memory of Zoe, a childhood friend, who had a similar way of positioning her toes, a similarly graceful gait:

> For there can be no doubt that even in her childhood the girl showed the same peculiarity of a graceful gait, with her toes almost perpendicularly raised as she stepped along; and it was because it represented that same gait that an ancient marble relief acquired such great importance for Norbert Hanold.[365]

This may explain the particular (and non-intellectual) interest the archaeologist takes in the sculpture. In Hanold, Freud explains, "the memories have turned into the phantasies".[366]

In Freud's view, the unconscious played a critical role in Hanold's mental process, inasmuch as "Norbert Hanold's memories of his childhood relations with Zoe were in a state of 'repression'; and here we have called them 'unconscious' memories".[367] That is, the distant memories that bring Hanold to imagine a real woman while observing a bas-relief are unconscious because they have been repressed:

> "Unconscious" is the wider concept; "repressed" is the narrower one. Everything that is repressed is unconscious; but we cannot assert that everything unconscious is repressed. If when Hanold saw the relief he had remembered his Zoe's gait, what had earlier been an unconscious memory of his would have become simultaneously active and conscious, and this would have shown that it had not earlier been repressed.[368]

The mental process that awakened Hanold's repression while observing the figure of Gradiva (by way of unconscious memories, dreams, and imagination) ended up in delusion: "What now took place in him was a struggle between the power of erotism and that of the forces that were repressing it; the manifestation of this struggle was a delusion".[369] We may argue that this delusion was caused by an optical illusion originated by the realism of the bas-relief, which made Hanold mistake the representation of a female figure for a woman: "One day it came about that one particular sculpture of that kind laid claim to the whole of the interest which is ordinarily directed only to a living woman, and with that his delusion was there".[370]

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[365] Ibid., p. 46.
[366] Ibid., p. 58.
[367] Ibid., p. 48.
[368] Ibid.
[369] Ibid., p. 49.
[370] Ibid., p. 46.

Thus, the life-like manner in which the figure has been sculpted played a crucial role in Hanold's delusion: "The figure seemed to him to have something 'of to-day' about her, in the best sense of the words, and it was as though the artist had captured her 'from the life' stepping along the street".[371] For this reason, Hanold's first reaction was to compare the posture of Gradiva's feet with that of real women: "The archeologist, obsessed by the problem of whether this posture of the feet corresponded to reality, began to make observations from life in order to examine the feet of contemporary women and girls".[372] Though, as we have seen, the most relevant comparison for Hanold is between Gradiva and Zoe. If the realism of Gradiva is reflected in the meaning of the figure's name—someone who steps along—the name *Zoe* is similarly meaningful: "Behind the impression of the sculpture being 'from the life' and the phantasy of its subject being Greek lay his memory of the name Zoe, which means 'life' in Greek".[373]

However, it is worth stressing that the term "realism" must be intended here in a broad sense, inasmuch as the stylistic features of the relief emphasise the intense emotional state and dynamic rendering of the sculpted figure, thus moving away from an anonymous naturalism. Moreover, the act of imagining a static image in motion must be linked, Freud suggests, not only to the naturalistic features of what is represented, but also to previous observational experiences—which may emerge consciously or unconsciously—with actual walking people, as the passages on Hanold's old friend suggest.

4 Freud on Michelangelo's *Moses*: Imagination and Mental Completion

Freud's psychological reading of sculpture, together with his idea that imagination plays a relevant role in the perception of art, is deepened in his analysis of Michelangelo's *Moses*, where he stresses the dialectics between the movement evoked by the posture of the sculpted figure and the imaginative response that it may provoke

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[371] Ibid., pp. 49-50.
[372] Ibid., p. 50.
[373] Ibid., pp. 50-51.

in the viewer: a completion of the action. In the course of his argument, Freud wonders how we can define the unique experience of Michelangelo's *Moses*, exploring the extent to which the beholder mentally completes the action frozen (but suggested by the posture and gesture of the figure) in the block of marble.

The approach that Freud undertakes in this study is that of a "layman" (his term); he is thus able to offer a personal reading that privileges the point of view of the observer, namely his or her response to the expression, both facial and corporeal, and movement that the figure of Moses is performing.[374] Significantly, Freud's approach seems to be similar to the one shown by the protagonist of Jensen's *Gradiva* to the Roman bas-relief, as we have previously seen. This allows him to observe that, while viewing a work of art,

> what grips us so powerfully can only be the artist's *intention*, in so far as he has succeeded in expressing it in his work and in getting us to understand it. I realise that this cannot be merely a matter of *intellectual* comprehension; what he aims at is to awaken in us the same emotional attitude, the same mental constellation as that which in him produced the impetus to create.[375]

From this passage, it emerges that a complete understanding of Michelangelo's *Moses* goes far beyond an intellectual or cultural investigation. On the contrary, what is crucial for comprehending a sculpted figure like *Moses* is an empathic and visceral response to the emotional state represented. In this sense, Freud is referring to what Maurice Merleau-Ponty will later call a *pre-reflective response*, through which the beholder is able to grasp the energy that the figure conveys and, with this, the artist's intention.[376] This suggests that the impetus felt by the artist during the artwork's creation is transposed to the observer through the expressiveness of the statue and that everything else—including the style, the reasons for the creation of the work, and the cultural context in which it was created—is inessential to this level of grasp.

Before undertaking a psychological analysis, Freud provides a description of the sculpture, to find the key elements that may attract the beholder's attention:

> The Moses of Michelangelo is represented as seated; his body faces forward, his head with its mighty beard looks to the left, his right foot rests on the ground and

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[374] Freud, *The Moses of Michelangelo*, p. 211.
[375] Ibid., p. 212.
[376] See Merleau-Ponty, *Phenomenology of Perception*.

his left leg is raised so that only the toes touch the ground. His right arm links the Tables of the Law with a portion of his beard; his left arm lies in his lap.[377]

From the overall pose of the figure, there are two details that attract Freud's curiosity: "These are the attitude of his right hand and the position of the two Tables of the Law".[378] The reason why Freud calls our attention to these details is that "this hand forms a very singular, unnatural link, and one which calls for explanation, between the Tables and the wrathful hero's beard".[379]

According to Freud, the gesture of the statue's right arm (fig. 91) activates the beholder's imagination, and the beholder's imagination completes the movement that Moses, the historical person depicted by the statue, is performing: "In imagination we complete the scene of which this movement, established by the evidence of the beard, is a part".[380] At this point, Freud retraces the gestures and poses that Moses may have taken throughout the entire movement, begun slightly before the moment captured by Michelangelo, in a time the beholder does not witness: "He was sitting there calmly, we will suppose, his head with its flowing beard facing forward, and his hand in all probability not near it at all".[381] Then, something happens, and an external event makes Moses change his pose:

> Suddenly the clamour strikes his ear; he turns his head and eyes in the direction from which the disturbance comes, sees the scene and takes it in. Now wrath and indignation lay hold of him; and he would fain leap up and punish the wrongdoers, annihilate them.[382]

According to Freud, three different phases that precede the scene sculpted by Michelangelo—represented in four drawings realised, "from the hand of an artist", under the indication of Freud himself (fig. 92)—may explain the actual posture of Moses.[383] The scene, as Freud interprets it, can only be understood with reference to the earlier scenes, which must be wholly imagined by the beholder.[384] Freud justifies

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[377] Freud, *The Moses of Michelangelo*, p. 214.
[378] Ibid., p. 222.
[379] Ibid., p. 212.
[380] Ibid., p. 224.
[381] Ibid., pp. 224-225.
[382] Ibid., p. 225.
[383] The first two figures show the preceding stages of Moses' movement according to Freud's hypothesis: "the first that of calm, the second that of highest tension, in which the figure is preparing to spring up and has abandoned its hold of the Tables, so that these are beginning to slip down" (Freud, *The Moses of Michelangelo*, p. 228). The third drawing reproduces the sculpture as we see it and the fourth sketch outlines a magnified detail of the positions of the hands and Tables.
[384] Freud, *The Moses of Michelangelo*, p. 225.

the upside-down position of the Tables—a "singular way to treat such sacred objects", as Freud himself states—as a result of the previous movements of Moses' right hand.[385] In this sense, Freud coordinates the movements of both Moses' right hand and the Tables in the following way (fig. 93):

> At first the figure of Moses, while it was still sitting quietly, carried the Tables perpendicularly under its right arm. Its right hand grasped their lower edge and found a hold in the projection on their front part. (The fact that this made them easier to carry sufficiently accounts for the upside-down position in which the Tables were held).[386]

Then, something outside the scene represented in the sculpture disturbed Moses, and this event suddenly made his posture change (fig. 94):

> He turned his head in its direction, and when he saw the spectacle he lifted his foot preparatory to starting up, let go the Tables with his hand and plunged it to the left and upwards into his beard, as though to turn his violence against his own body. The Tables were now consigned to the pressure of his arm, which had to squeeze them against his side. But this support was not sufficient and the Tables began to slip in a forward and downward direction. The upper edge, which had been held horizontally, now began to face forwards and downwards; and the lower edge, deprived of its stay, was nearing the stone seat with its front corner.[387]

Thus, the Tables are in such an unusual position in order to prevent them from falling down and shattering (fig. 95):

> It is to prevent this that the right hand retreated, let go the beard, a part of which was drawn back with it unintentionally, came against the upper edge of the Tables in time and held them near the hind corner, which had now come uppermost.[388]

Following these considerations, what the beholder sees "is not the inception of a violent action but the remains of a movement that has already taken place".[389] In other words, the position we see offers nothing to suggest that any further movement was linked to the event that made Moses leap up:

> In his first transport of fury, Moses desired to act, to spring up and take vengeance and forget the Tables; but he has overcome the temptation, and he will now remain seated and still, in his frozen wrath and in his pain mingled with contempt. Nor will he throwaway the Tables so that they will break on the stones, for it is on their especial account that he has controlled his anger; it was to preserve them that he kept his passion in check. In giving way to his rage and indignation, he had to neglect the Tables, and the hand which upheld them was

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[385] Ibid., pp. 226-227.
[386] Ibid.
[387] Ibid., pp. 227-228.
[388] Ibid., p. 228.
[389] Ibid., p. 229.

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withdrawn. They began to slide down and were in danger of being broken. This brought him to himself. He remembered his mission and for its sake renounced an indulgence of his feelings. His hand returned and saved the unsupported Tables before they had actually fallen to the ground. In this attitude he remained immobilized, and in this attitude Michelangelo has portrayed him as the guardian of the tomb.[390]

Motion and emotion (conveyed to the observer by the realism of the pose and expression) are the fundamental components of the statue that attract the beholder's attention. Freud supplies greater detail regarding the elements that suggest the emotional and narrative complexity of the scene the statue enables the viewer to imaginatively represent as follows: "the lines of the face reflect the feelings which have won the ascendancy; the middle of the figure shows the traces of suppressed movement; and the foot still retains the attitude of the projected action".[391] In Freud's *Moses of Michelangelo*, as his *Delusions and Dreams in Jensen's "Gradiva"*, the pivotal role of the beholder's imagination in aesthetic response emerges. The overall pose, gestures, suggested movements (of the head, hands, arms, left leg and foot, even the beard and the robe) and the emotional attitude expressed by Moses (fig. 96) would not be fully comprehensible to an observer who lacked the capacity to imagine their origin and outcomes.

The significance of imagination, mental images, and motor imagery in perception was already pointed out by Robert Vischer:

> Imagination is an act by which we mentally simulate something that previously existed as a vague content of our sensation as sensuous, concrete form. If we then apply the same word to abstract thoughts, we thereby imply that these too are accompanied by mental images. Our concern henceforth is thus with mental activity. That this activity also essentially involves the central nervous system is evident from the unity of body and mind.[392]

In another passage, Vischer argues that internal and external (or material) images are strictly related: "We have seen how the perception of a pleasing form evokes a pleasurable sensation and how such an image symbolically relates to the idea of our own bodies—or conversely, how the imagination seeks to experience itself through the image".[393] In imagining the figure moving, as in the beholder's reaction

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[390] Ibid., pp. 229-230.
[391] Ibid., p. 230.
[392] Vischer, *On the Optical Sense of Form*, p. 99.
[393] Ibid., p. 104.

hypothesised by Freud, one identifies him- or herself with Moses, experiencing the movement and feeling the emotion expressed by the statue's appearance: "We thus have the wonderful ability to project and incorporate our own physical form into an objective form".[394]

Recent neuroscientific and neuroaesthetic research on the experience, observation, and imagination of movement seems to confirm Lessing's and Freud's insights. It is possible to identify the neuronal correlates of movement perception and imagination in observers confronted with (even static) works of art. One possibility is that the gestures observed activate memories of previously observed or performed gestures, turning the perception of a segment of a movement into the imagination of a complete action. In this way, the beholder creates, most of the time unconsciously, a motor image of a static figure in his or her mind. It is in this way that material and mental images are usually related.

5 Perceiving Movements, Understanding Intentions

The perception of movement is capable of enabling or facilitating the understanding of the intentions of others, which are also evident in body postures, gestures, and physiognomic expressions. This is what emerges from Lessing's analysis of *Laocoön* and Freud's description of *Gradiva* and *Moses*. As we have seen in Lessing's text, a beholder in front of a painting or sculpture is able to anticipate the subsequent scenes, including movements, gestures, and sounds. In this sense, the beholder of *Laocoön*'s facial expression can imagine him cry out. Similarly, the beholder of *Gradiva* is encouraged to mentally continue the female figure's walk, following the position of her feet, and also to imagine the movement of the drapery that accompanies that of her legs, whereas the beholder of *Moses* is invited to reconstruct Moses' action from the beginning to the end.

Therefore, there must be a relationship between static art and time. Lessing sets out this problem in chapter sixteen of the *Laocoön*, where he argues that:

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[394] Ibid.

> Objects or parts of objects which exist in space are called bodies. Accordingly, bodies with their visible properties are the true subjects of painting.
> Objects or parts of objects which follow one another are called actions. Accordingly, actions are the true subjects of poetry.
> However, bodies do not exist in place only, but also in time. They persist in time, and in each moment of their duration they may assume a different appearance or stand in a different combination. Each of these momentary appearances and combinations is the result of a preceding one and can be the cause of a subsequent one, which means that it can be, as it were, the center of an action. Consequently, painting too can imitate actions, but only by suggestion through bodies.
> On the other hand, actions cannot exist independently, but must be joined to certain beings or things.[395]

Since in static art movement can have a duration only in the beholder's mind, in still works of art time is related to imagination. For this reason, what the artist captures must be a moment of absolute pregnancy:

> Painting can use only a single moment of an action in its coexisting compositions and must therefore choose the one which is most suggestive and from which the preceding and succeeding actions are most easily comprehensible.[396]

This is confirmed, in more recent times, by Rosalind Krauss, who states that: "Into any spatial organisation there will be folded an implicit statement about the nature of temporal experience".[397] Adding that: "Sculpture is a medium peculiarly located at the juncture between stillness and motion, time arrested and time passing. From this tension…comes its enormous expressive power".[398] And in this tension, we may add, imagination plays a considerable role.

At this point, we are ready to go a step further and address the question of the biological processes underlying movement observation and their consequences in art perception in terms of aesthetic experience and empathy. In doing so, it is possible to shed new light on the way we bodily engage with works of art, thus confirming Freud's argument, according to which art is not "merely a matter of *intellectual* comprehension" but also a matter of "emotional attitude", which involves both the artist (during creation) as well as the viewer (during perception).[399]

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[395] Lessing, *Laocoön*, p. 78.
[396] Ibid.
[397] Rosalind E. Krauss, *Passages in Modern Sculpture* (New York: The Viking Press, 1977), p. 4.
[398] Ibid., p. 5.
[399] Freud, *The Moses of Michelangelo*, p. 212.

In *Delusions and Dreams in Jensen's "Gradiva"* and *The Moses of Michelangelo*, Freud dealt with the unsolved riddle of the powerful effect that works of art often exercise on beholders, the depth of pleasure they can bring. The positioning of Gradiva (particularly her feet) and Moses is key to understanding how the brain perceives movement where there is none. Their poses are the formulas in the two sculptures that attract the beholder's attention, activating brain-body responses that involve motor imagery, embodied simulation, predictive processing, mental completion, and memory. But what do these brain-body processes consist of, at a neurobiological level? This question has now become even more pressing because the cognitive neurosciences have reached important achievements in this area.

A number of neuroscientific discoveries and theories have shed light on the neurological substrate of the representation of movement; these include Antonio Damasio's "as-if" theory, the discovery of mirror neurons, Vittorio Gallese's embodied simulation theory, Jean Decety's and Marc Jeannerod's research on the relationship between vision and movement, and the works of Jakob Hohwy and Andy Clark on prediction error minimisation. All have contributed to the study of empathy and intersubjectivity—but what is remarkable for our purposes is that these advancements allow us to more fully understand the mechanism responsible for our perception of movement in static works of art.

To conceptualise the feeling of inner imitation of another person's movement or emotions, Antonio Damasio proposed 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".[400] In this way, determinate neurons can represent in a subject's brain the observed movement performed by another person "and produce signals toward sensorimotor structures so

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[400] Antonio Damasio, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (London: Vintage Books, 2003), p. 115. Damasio referred to the "as-if-body-loop" mechanism first in Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (London: Vintage Books, 2006); and then in Damasio, *The Feeling of What Happens: Body, Emotion, and the Making of Consciousness* (London: Vintage Books, 2000).

that the corresponding movements are either 'previewed', in simulation mode, or actually executed".[401]

The neurons that Damasio is referring to are the so-called mirror neurons, discovered by Giacomo Rizzolatti, Luciano Fadiga, Leonardo Fogassi and Vittorio Gallese in 1992 and located in the frontal cortex of both monkeys' and humans' brains. With the activity of mirror neurons,

> the brain momentarily creates a set of body maps that does *not* correspond exactly to the current reality of the body. The brain uses the incoming body signals like clay to sculpt a particular body state in the regions where such a pattern can be constructed, i.e. the body-sensing regions. What one feels then is based on that 'false' construction, not on the 'real' body state.[402]

Mirror neurons are also the ground of Gallese's embodied simulation theory—which describes the internal simulation of an action, gesture, or emotion, observed or imagined—inasmuch as they respond both to self-initiated, goal-directed movement and to the perception of the same movements performed by another individual.[403] In this sense, mirror neurons constitute the link between the visual perception of an action and the subject's proprioception—that is, the sense through which humans perceive the position and movement of their own body. They help observers to translate their visual perception of another person's behavior into a mental plan of that behavior in themselves, thus enabling a *prediction* of the other person's thoughts or actions. In this regard, Gallese's proposal is that mirror neuron activation can generate an internal simulation of another person's behavior. This is because, as Goldman and Gallese state, mirror neurons rely on an "internal representation of goals, emotions, body states and the like to map the same states in other individuals".[404]

Mirror neurons reveal automatic processes—such as embodied simulation, imagination, intersubjectivity, and empathy—that may or may not be experienced at a conscious level, although they shape conscious behavior.[405] In this sense, as pointed

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[401] Damasio, *Looking for Spinoza*, p. 115.
[402] Ibid., p. 116.
[403] For Gallese's embodied simulation theory, see fn. 66.
[404] Alvin Goldman and Gallese, "Reply to Schulkin", *Trends in Cognitive Sciences*, 4 (2000), pp. 255-256 (256).
[405] See Gallagher, *How the Body Shapes the Mind*, p. 221.

out by Shaun Gallagher, mirror neurons pose the problem of the relationship between observation and simulation:

> In the experimental situation when I am asked to observe or to simulate an action performed by someone else, imaging results show significant overlap for observation and simulation in the supplementary motor area, the dorsal premotor cortex, the supramarginal gyrus, and the superior parietal lobe.[406]

On this ground, we can argue that perception and simulation are not two separate processes: "Perception of action is already an understanding of the action; there is no extra step involved that could count as a separate simulation routine".[407] Thus, observing an action automatically leads the subject to simulate or partially activate the goal/motor act routine. In this way, "we understand the actions of others by means of our own 'motor knowledge' [and] this knowledge enables us immediately to attribute an intentional meaning to the movements of others".[408]

Around the same time that Giacomo Rizzolatti and his team discovered the existence and functions of mirror neurons, Jean Decety and Marc Jeannerod begun to study the relationship between vision, movement, and imitative motor cortex activity.[409] Decety and Julie Grèzes, in particular, showed that the neural circuit involved in action-execution overlaps with the circuit activated when actions are observed.[410] This circuit involves the premotor cortex, the inferior parietal lobule, the supplementary motor area and the cerebellum.[411] Decety also did substantial

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[406] Ibid., p. 222.

[407] Ibid., p. 223.

[408] Rizzolatti and Sinigaglia, "Mirror Neurons and Motor Intentionality", *Functional Neurology*, 22 (2007), pp. 205-210 (205).

[409] See Decety and Jennifer A. Stevens, "Action Representation and Its Role in Social Interaction", in *The Handbook of Imagination and Mental Simulation*, ed. by Keith D. Markman, William M. P. Klein and Julie A. Suhr (New York: Psychology Press, 2009), pp. 3-20; Marc Jeannerod, "Neural Simulation of Action: A Unifying Mechanism for Motor Cognition", *NeuroImage*, 14 (2001), pp. 103-109; Decety, "Do Imagined and Executed Actions Share the Same Neural Substrate?", *Cognitive Brain Research*, 3 (1996), pp. 87-93; Decety, "Neural Representations for Action", *Reviews in the Neurosciences*, 7 (1996), pp. 285-297; Jeannerod, "The Representing Brain: Neural Correlates of Motor Intention and Imagery", *Behavioral and Brain Sciences*, 17 (1994), pp. 187-202; Decety and David H. Ingvar, "Brain Structures Participating in Mental Simulation of Motor Behavior: A Neuropsychological Interpretation", *Acta Psychologica*, 73 (1990), pp. 13-34; and Decety, Jeannerod and Claude Prablanc, "The Timing of Mentally Represented Actions", *Behavioural Brain Research*, 34 (1989), pp. 35-42.

[410] See Decety and Julie Grèzes, "Does Visual Perception of Object Afford Action? Evidence from a Neuroimaging Study", *Neuropsychologia*, 40 (2002), pp. 212-222; Decety and Grèzes, "Functional Anatomy of Execution, Mental Simulation, Observation, and Verb Generation of Actions: A Meta-Analysis", *Human Brain Mapping*, 12 (2001), pp. 1-19; and Decety and Grèzes, "Neural Mechanisms Subserving the Perception of Human Actions", *Trends in Cognitive Science*, 3 (1999), pp. 172-178.

[411] Ibid.

experimental work showing that imagining one's own actions and imagining another's actions activate the same areas of the premotor cortex and posterior parietal lobe.[412] This contributes to what Wolfgang Prinz called *common coding theory*, that is, the scientific foundation of the relationships between perception and action. More specifically, supporting evidence suggests that perceived events and planned actions share a common representational domain (common coding).[413] It is in this respect that sensory and motor representations are shared between individuals.

The role of prediction in perception, already explored in the aforementioned studies on mirror neurons, has also been investigated from a different perspective, both in philosophy and neuroscience, starting from Hermann von Helmholtz's idea of the brain as a hypothesis tester and culminating in the more recent works of Jakob Hohwy and Andy Clark.[414] Empirical evidence suggests that the faculty to predict future events is a fundamental aspect of human cognition.[415] Research in visual perception suggests that one of the brain's main aim is to reduce unwelcome surprise and to successfully predict and interact with the surrounding environment.[416] Our brain continuously anticipates what we will hear, see, and subsequently feel.[417] For instance, when listening to someone speaking, we often deduce what the person is

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[412] See Decety and Grèzes, *Neural Mechanisms Subserving the Perception of Human Actions*; Riitta Hari et al., "Activation of Human Primary Motor Cortex During Action Observation: A Neuromagnetic Study", *Proceedings of the National Academy of Sciences of the United States of America*, 95 (1998), pp. 15061-15065; and Decety et al., "Mapping Motor Representations with Positron Emission Tomography", *Nature*, 371 (1994), pp. 600-602.

[413] See Günter Knoblich and Wolfgang Prinz, "Recognition of Self-Generated Actions from Kinematic Displays of Drawing", *Journal of Experimental Psychology, Human Perception and Performance*, 27 (2001), pp. 456-465; Prinz, "Perception and Action Planning", *European Journal of Cognitive Psychology*, 9 (1997), pp. 129-154; and Prinz, "Modes of Linkage between Perception and Action", in *Cognition and Motor Processes*, ed. by Wolfgang Prinz and Andries F. Sanders (Berlin: Springer, 1984), pp. 185-193.

[414] See Hermann von Helmholtz, "Über das Sehen des Menschen", in id., *Vorträge und Reden von Hermann Helmholtz*, 2 vols (Braunschweig: Friedrich Vieweg und Sohn, 1855), I, pp. 85-117; Jakob Hohwy, *The Predictive Mind* (Oxford: Oxford University Press, 2013); and Clark, *Surfing Uncertainty*.

[415] See Moshe Bar, "Predictions: A Universal Principle in the Operation of the Human Brain. Introduction", *Philosophical Transactions of the Royal Society B: Biological Sciences,* 364 (2009), pp. 1181-1182; Karl J. Friston, "A Theory of Cortical Responses", *Philosophical Transactions of the Royal Society B: Biological Sciences,* 360 (2005), pp. 815-836; and Jeffrey Hawkins, *On Intelligence* (New York: Times Books, 2004).

[416] See Arjen Alink et al., "Stimulus Predictability Reduces Responses in Primary Visual Cortex", *Journal of Neuroscience*, 30 (2010), pp. 2960-2966; and Bar et al., "Top-Down Facilitation of Visual Recognition", *Proceedings of the National Academy of Sciences of the United States of America*, 103 (2006), pp. 449-454.

[417] See Dobromir Rahnev, Hakwan Lau and Floris P. de Lange, "Prior Expectation Modulates the Interaction Between Sensory and Prefrontal Regions in the Human Brain", *Journal of Neuroscience*, 29 (2011), pp. 10741-10748.

going to say before he or she has finished speaking. Predictions happen at all levels, ranging from perception of shapes and sounds to complex processes like language and social cognition.[418] These studies point out that prediction is not just one of the brain's prerogatives but rather its primary function.[419] According to the predictive coding model, the information that reaches the brain is compared with the prior expectation.[420] As stated by Hohwy, "we minimize the error between the hypotheses generated on the basis of our model of the world and the sensory deliverances coming from the world".[421] Moreover, Hohwy points out that:

> Perception arises in prediction error minimization where the brain's hypotheses about the world are stepwise brought closer to the flow of sensory input caused by things in the world. This is an elegant idea because it gives the brain all the tools it needs to extract the causal regularities in the world and use them to predict what comes next in a way that is sensitive to what is currently delivered to the senses.[422]

These studies on embodied simulation, common coding, and predictive processing are extremely important for the purpose of addressing the problem of aesthetic responses to so-called implied actions, namely, actions the initial or final stage of which is occulted, as the three sculptures representing Laocoön, Gradiva, and Moses exemplify. In fact, as Freedberg and Gallese pointed out:

> The discovery of mirror neurons illuminates the neural underpinnings of the frequent but hitherto unexplained feeling of physical reaction, often in apparent imitation of the actions represented within a work of art or suggested by the implied movements involved in its making.[423]

In aesthetic perception, mirror neurons and predictive processing enable the understanding of the intention of the figures represented, even when the beginning or conclusion of the action they are performing is only suggested, thus confirming

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[418] See Peter Kok, Janneke F.M. Jehee and Floris P. de Lange, "Less is More: Expectation Sharpens Representations in the Primary Visual Cortex", *Neuron*, 2 (2012), pp. 265-270; and Ana Todorovic et al., "Prior Expectation Mediates Neural Adaptation to Repeated Sounds in the Auditory Cortex: An MEG Study", *Journal of Neuroscience*, 25 (2011), pp. 9118-9123.

[419] See Hanneke H. M. den Ouden, "How Prediction Errors Shape Perception, Attention, and Motivation", *Frontiers in Psychology*, 3 (2012), pp. 1-12.

[420] See Madeleine Ransom and Sina Fazelpour, "Three Problems for the Predictive Coding Theory of Attention", (2015), pp. 1-11. <http://mindsonline.philosophyofbrains.com/wp-content/uploads/2015/09/2015-Ransom-and-Fazelpour-Three-Problems-for-the-Predictive-Coding-Theory-of-Attention-extended-abstract.pdf> [accessed 25 August 2020]; and Rajesh P. N. Rao and Dana H. Ballard, "Predictive Coding in the Visual Cortex: A Functional Interpretation of Some Extra-Classical Receptive-Field Effects", *Nature Neuroscience*, 2 (1999), pp. 79-87.

[421] Hohwy, *The Predictive Mind*, p. 2.

[422] Ibid., p. 55.

[423] Freedberg and Gallese, *Motion, Emotion and Empathy in Aesthetic Experience*, p. 199.

Lessing's and Freud's hypothesis about the role of imagination and motor imagery in aesthetic responses to sculpted figures suggesting movement. In this sense, a series of empirical investigations reveal the correlation between the observation of the depiction of actions in static artworks and the activation, in the beholder's brain, of specific networks and areas, including mirror neurons, pointing to the critical role played by embodiment, prediction, and imagination in these kinds of responses.[424] In fact, in inwardly simulating a suggested action we do nothing but imagine (or predict) the whole action. In this, we are informed by similar observational experiences that we previously acquired by observing others or ourselves.

Thus, even in a spatial art like sculpture, space and time cannot be separated. In any representation of movement there is implicit a temporal experience. In this regard, Merleau-Ponty states:

> None of the dimensions of time can be deduced from the others. But the present (taken broadly, with its originary horizons of past and future) has, nevertheless, a privileged status because it is the zone in which being and consciousness coincide. When I remember an earlier perception, or when I imagine visiting my friend Paul who is in Brazil, it is certainly true that I intend the past itself in its place, or Paul himself in the world, and not some interposed mental object. But in the end, my act of representation (in contrast with represented experiences) is actually present to me; the one is perceived while the others are in fact merely represented. In order to appear to me, a previous experience or a possible one must be carried into being by a primary consciousness, which in this case is my inner perception of recollection or imagination.[425]

Therefore, an observer, in completing a movement in his or her imagination, experiences past sequences and future sequences of the same action at once. In doing so, the viewer experiences in the present at least part of the action and its completion that the sculpture is supposed to perform.

A study of the aesthetic experience of a sculpture should include a discussion of the temporal consequences, in the beholder's mind, of a particular representation of gesture. To do this, we need to consider the neural mechanism underlying the

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[424] See, for instance, Gallese et al., *Behavioral and Autonomic Responses to Real and Digital Reproductions of Works of Art*; Mineo et al., *Motor Facilitation during Observation of Implied Motion*; Concerto et al., *Observation of Implied Motion in a Work of Art Modulates Cortical Connectivity and Plasticity*; Concerto et al., *Neural Circuits Underlying Motor Facilitation during Observation of Implied Motion*; Di Dio et al., *Human, Nature, Dynamism*; Di Dio, Macaluso and Rizzolatti, *The Golden Beauty*; and Battaglia, Lisanby and Freedberg, *Corticomotor Excitability during Observation and Imagination of a Work of Art*.

[425] Merleau-Ponty, *Phenomenology of Perception*, pp. 447-448.

phenomenon of inner imitation that often occurs when an observer contemplates a figure suggesting movement. The representation of a figure in the middle of a movement (a body in tension, caught in the act of freeing itself from a snake, as in *Laocoön*; a walk, as in the *Gradiva* bas-relief; or a different movement, as in Michelangelo's *Moses*) activates a series of brain networks—networks that include mirror neurons—in a viewer. This brain activity is the root of an embodied simulation of the prolonged action (that of fighting, walking, or moving) suggested by a frozen gesture or posture observed. Embodied simulation is what enables a viewer to understand intentions and reproduce the entire movement, or a prolonged version of it (as in walking), in his or her mind. Consequently, imagination allows the viewer to enter a work of art and thus shift his or her role from mere passive contemplator to creative participant, called to mentally "finish" what the artist, given the limitation of the materiality applied, cannot alone provide: art that depicts actions unfolding in time.

CHAPTER FIVE

Aesthetic Responses to the Unfinished as Rough Surface: Implied Actions, Imagination, and Imitation Learning

This chapter proposes how beholders internally process unfinished works of art with a rough surface. It is divided into four sections and takes into consideration five of Michelangelo Buonarroti's unfinished sculptures, pointing out their empathic and imaginative potential.

The first section shows the relationship between the unfinished and the process of image-making. Renaissance authors such as Giorgio Vasari and Benvenuto Cellini associated the observation of unfinished works of art with learning. Their assumption seems to find confirmation in recent studies on mirror neurons and imitation learning.

The second section argues that looking at a rough surface of a work of art also means to imitate the implied actions, that is, the actions performed by the artist during the creation of the work. The beholder focused on the surface, I propose, is inclined to mentally simulate the artist's gesture that drafted the sculptures through the visible graphic signs made by specific tools (e.g. chisels, manual drills, or brushes).

After introducing the roles of memory and background knowledge in visual perception, the fourth section proposes that the unfinished also has a pedagogical function in the sense that, rough surfaces, in activating a neural mechanism that includes the mirror neuron system, lead the beholder to understand the process of creation of the work observed. The process of imitation learning and the empathic engagement that beholders establish with the work of art clarify how the incompleteness also has a pedagogical function of the kind earlier recognised by both Cellini and Vasari.

1   Vasari, Cellini, Michelangelo, and the Process of Image-Making

In *The Problem of Form in Painting and Sculpture* (1893), Adolf von Hildebrand argues that the aesthetic value of an artwork comes from the connection between the artist's mental artistic process and the materialisation of his or her ideas in the work (s)he realises:

> We must strive to understand clearly the connection between the artist's inner mental process and the realisation of his ideas in his work. Unless we can show this mental process, demonstrate it, so to speak, as oculos, then all insight into Art remains obscure and it is left to each individual to interpret the process this way or that according to the refinement of his senses.[426]

The subject of this chapter is about this connection and, more specifically, the reconstruction of the artist's mental and material process in the beholder's mind. In fact, the unfinished seems to show that mental process that Hildebrand was referring to in the aforementioned passage.

In this chapter, I address the problem of the aesthetic responses of beholders to the unfinished in the category of sketched, or rough surfaces, by focusing on five statues by Michelangelo Buonarroti, the solution of which, I argue, requires the application of neuroscientific findings. Although at present there are no published experiments testing the way in which beholders respond to certain types of unfinished works of art, there is empirical evidence indirectly suggesting that the observation of a graphic mark—such as a cut or brushstroke—could lead the beholder to imagine the artist's act of sculpting a material or applying painting on a two-dimensional support.

"Michelangelo's unfinished works manifest their incompleteness in a way that one cannot help noticing, no matter at what point one gazes, even if it does not always extend over the entire surfaces".[427] With this sentence, Creighton Gilbert catches the issue of the perception of the unfinished that is present in many of Michelangelo's works of art, particularly sculptures. In this regard, Vasari wrote, "there are few finished statues to be seen out of all that he executed in the prime of his manhood, and

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[426] Hildebrand, *The Problem of Form in Painting and Sculpture*, p. 15.
[427] Gilbert, *What is Expressed in Michelangelo's 'Non-Finito'*, p. 57.

that those completely finished were executed by him in his youth…the others, I say, were all left unfinished, and, moreover, they are many".[428]

From Michelangelo's unfinished output, this chapter concentrates on the interrupted statue of *St Matthew* (fig. 31) and the unfinished *Slaves* (figs. 10–13). The *Slaves* is a group of six statues realised for Pope Julius II's tomb in San Pietro in Vincoli in Rome. Two of them are finished—the *Dying Slave* and the *Rebellious Slave* —whereas the other four—the *Bearded Slave* (fig. 10), the *Awakening Slave* (fig. 11), the *Atlas Slave* (fig. 12) and the *Young Slave* (fig. 13)—are incomplete. Among these *Slaves*, I deal with the last four, which better express, along with the *St Matthew*, the concepts of implied action, imagination, and imitation learning applied to sculpture.

As stipulated in the contract between Michelangelo and the consuls of the Arte della Lana, the statue of *St Matthew*, which Michelangelo realised in 1506, was part of a group of twelve sculptures, as the number of the Apostles, to be placed in the Florentine Cathedral of Santa Maria del Fiore.[429] However, as a consequence of his acceptance to realise the tomb for Pope Julius II—as Michelangelo himself stated in a letter dated December 1523 to Giovan Francesco Fattucci—he carved only this unfinished piece.[430] As a result of this new commission, on 18 December 1505, the contract for the *St Matthew* was cancelled.[431]

Describing the *St Matthew*, Vasari adopted the adjective "sketched" to refer to its unfinished state, stating that

> sketched in this manner, it shows its perfection and teaches sculptors in what way figures can be carved out of marble without their coming out misshapen, always

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[428] Vasari, *Vita di Michelagnolo Buonarruoti Fiorentino*, p. 92: "delle sue statue se ne vede poche finite nella sua virilità, che le finite affatto sono state condotte da lui nella gioventù…l'altre, dico sono [re]state imperfette, e son molte maggiormente". Translated in Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, IX, p. 83.

[429] See Michelangelo Buonarroti, *I contratti di Michelangelo*, ed. by Lucilla Bardeschi Ciulich (Florence: Studio per edizioni scelte, 2005), pp. 18-21.

[430] See Buonarroti, *Il Carteggio di Michelangelo*, ed. by Paola Barocchi and Renzo Ristori, 5 vols (Florence: Sansoni, 1973), III, p. 7.

[431] See Pope-Hennessy, *Italian High Renaissance and Baroque Sculpture*, 3 vols (London: Phaidon, 1963), catalogue, p. 12.

improving the figure by removing the marble judiciously and being able to change something, if there were any need.[432]

In this statement is condensed the idea according to which the unfinished allows the observer—in particular, the beginner sculptor—to acquire knowledge about the process and method undertaken by the artist in making the work and, consequently, to learn how to carve stones properly. In this respect, it is worth investigating how the problem concerning image-making and the perception of unfinished works of art are related.[433]

The group of *Slaves*, dated c. 1520–1530, shows many similarities to the sculpture of *St Matthew* previously mentioned. There are some clues that suggest they were part of the project for the tomb of Pope Julius II, dated 1505–1545, as a drawing that represents six well-defined figures seems to hint.[434] The resizing of the monument—for which Michelangelo realised six projects—decided by the Pope himself, would have forced Michelangelo to exclude the *Slaves* and *Victories* in the final version of the tomb, probably both initially conceived for the ground level.[435]

These sculptures share a similar appearance: all present a rough surface as a result of the hits made by the artist with different types of chisels in the act of shaping the figures. This aspect becomes clearer if we focus on a specific detail. Considering the bottom part of the *Awakening Slave* (fig. 97), for example, we notice that, at the centre, there are two rows of parallel lines, executed with a type of small chisel, which define the lower part of the figure's left leg; around it is a series of strokes, irregularly arranged, which suggest other forms, probably executed with a larger chisel; finally, the right leg is surrounded by small holes, likely made with a hand drill. The object of investigation of this chapter is exactly this sort of appearance,

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[432] Vasari, *Vita di Michelagnolo Buonarruoti Fiorentino*, p. 22: "la quale statua cosí abbozzata mostra la sua perfezzione et insegna agli scultori in che maniera si cavano le figure de' marmi senza che venghino storpiate, per potere sempre guadagnare col giudizio levando del marmo et avervi da potersi ritrarre e mutare qualcosa, come accade se bisognassi".

[433] For more on the unfinished as a phenomenon that allows the viewer to see the method undertaken by the artist in creating the work of art, see Carmen C. Bambach, "Leonardo, Michelangelo, and Notions of the Unfinished in Art", in *Unfinished*, pp. 30-41, 261-265; and Paula Carabell, "Image and Identity in the Unfinished Works of Michelangelo", *Anthropology and Aesthetics*, 32 (1997), pp. 83-105.

[434] See Christof Thoenes and Thomas Pöpper, "Catalogue of Drawings", in *Michelangelo: Complete Works*, pp. 458-717 (491).

[435] For Michelangelo's tomb of Pope Julius II, see Condivi, *Vita di Michelagnolo Buonarroti*, pp. 22-26; and Vasari, *Vita di Michelagnolo Buonarruoti Fiorentino*, pp. 26-30.

which is the consequence of the abandonment of works of art in mid-creation by the artist.

These sculptures not only share the same kind of rough surface but also a similar level of unfinishedness: some parts of the figures' bodies are still inside the stone, others are emerged but only sketched out, and still others are clearly visible and well detailed but with their surface still rough. Because of their appearance, Vasari identifies a particular purpose for the unfinished *Slaves* when he states, "four Prisons sketched out, that can teach one how to carve figures out of marbles with a secure manner so not to ruin the stones".[436] Vasari, therefore, in repeating what he said about the *St Matthew*, attributes a pedagogical potential to these sculptures, as they provide instructions to the observer on how to properly deal with marble. However, it is worth clarifying that this potential can be seen as a consequence of the unfinished state and not as the aim of the artist.[437]

We have seen that, for Vasari, it is important for a beginner sculptor to learn from Michelangelo's unfinished works because he adopted the best way to sculpt marble. In fact, his method gave the artist the possibility of applying modifications during the work in progress without damaging the block. At this point, a question arises: what did Michelangelo's method of image-making consist of? To answer this question, we first need to consider the concept of sculpture that Michelangelo had in mind. We find an important indication of Michelangelo's definition of sculpture in a letter that he wrote in 1547 to Benedetto Varchi: "For sculpture I mean what one does by force of taking away".[438] As it is evident, Michelangelo did not intend sculpture as a process of addition, as it is in the case of clay or bronze, for instance. Quite the opposite, he meant sculpture as a process of subtraction. He expands this concept in one of his

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[436] Vasari, *Vita di Michelagnolo Buonarruoti Fiorentino*, p. 110: "quattro Prigioni bozzati, che possono insegnare a cavare de' marmi le figure con un modo sicuro da non istorpiare i sassi".

[437] Zeki's argument that Michelangelo left most of his artworks voluntarily unfinished, specifically to express philosophical concepts, must therefore be rejected (see Zeki, *Inner Vision*, p. 51; and Zeki, *Neural Concept Formation and Art*, p. 68). In addition, Gilbert's historical reconstruction contradicts Zeki's assumption (see Gilbert, *What is Expressed in Michelangelo's 'Non-Finito'*). For a detailed review of the literature on the possible reasons why Michelangelo left the majority of his works unfinished, see Juergen Schulz, "Michelangelo's Unfinished Works", *The Art Bulletin*, 57 (1975), pp. 366-373.

[438] Buonarroti, *Il Carteggio di Michelangelo*, IV, p. 266: "io intendo scultura quella che si fa per forza di levare".

sonnets, in which he states, "not even the best of artists has any conception that a single marble block does not contain within its excess, and that is only attained by the hand that obeys the intellect".[439] Michelangelo, in this passage, clearly expresses the idea that the image to be carved is already present inside the block of marble but is covered by the superfluous. It is the task of the artist to remove the matter in excess and free the image.

Michelangelo's method of carving was celebrated by many of his contemporaries, Vasari being one of them. In another passage, addressed to beginner sculptors, he praises Michelangelo's method of carving, explaining how it works:

> You take a figure in wax or some other solid material, and lay it horizontally in a vessel of water, which water being by its nature flat and level at the surface, as you raise the said figure little by little from the level, so it comes about that the more salient parts are revealed, while the lower parts those, namely, on the under side of the figure remain hidden, until in the end it all comes into view. In the same manner must figures be carved out of marble with the chisel, first laying bare the more salient parts, and then little by little the lower parts; and this method may be seen to have been followed by Michelangelo in the above-mentioned *Slaves*.[440]

Vasari here, using a metaphor, gives instructions about how to correctly create a sculpture. Basing his explanation on Michelangelo's unfinished *Slaves*, he states that the sculptor should start carving from the surface of the block of marble toward the depth. The result is that the first forms to emerge are almost finished, whereas the recessive parts are roughly sketched out or remain entirely embedded in the stone.

The method adopted by Michelangelo in sculpture, evident in his unfinished output, seems to have been very different from that practiced by the majority of the artists of the time. As we know from Benvenuto Cellini—who recorded and recommended Michelangelo's method in chapter six of his treatise *On Sculpture*

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[439] Buonarroti, *The Poetry of Michelangelo: An Annotated Translation*, ed. by James M. Saslow (New Haven: Yale University Press, 1991), p. 302: "Non ha l'ottimo artista alcun concetto, ch' un marmo solo in sé non circoscriva col suo superchio; e solo a quello arriva la man che ubbidisce all'intelletto". Translated in ibid.

[440] Vasari, *Vita di Michelagnolo Buonarruoti Fiorentino*, p. 110: "che se e' si pigliassi una figura di cera o d'altra materia dura, e si mettessi a diacere in una conca d'acqua, la quale acqua essendo per sua natura nella sua sommità piana e pari, alzando la detta figura a poco a poco del pari, così vengono a scoprirsi prima le parti più rilevate et a nascondersi i fondi, cioè le parti più basse della figura, tanto che nel fine ella così viene scoperta tutta. Nel medesimo modo si debbono cavare con lo scarpello le figure de' marmi, prima scoprendo le parti più rilevate, e di mano in mano le più basse, il quale modo si vede osservato da Michelagnolo ne' sopra detti prigioni". Translation adapted from Vasari, *Lives of the Most Eminent Painters, Sculptors and Architects*, IX, pp. 106-107.

(1568)—generally, artists worked from all sides at the same time to carve a block of marble, bringing out the whole figure at once. On the contrary, Michelangelo's method consisted of completing one side at a time:

> When you are satisfied with your model you draw the principal views of your statue on to the stone, and mind it be well drawn, for if not you may miscut your block. The best method I ever saw was the one that Michelangelo used; when you have drawn on your principal view you begin to chisel it round as if you wanted to work a half relief, and thus gradually it comes to be cut out.[441]

The method that Cellini is describing in this passage is also evident in the statue of *St Matthew*, which was carved from the front of the block towards the back:

> I must not omit to say for the guidance of those who are unskilled in working marble, that they may strike boldly in with their *subbie*; for the more delicate *subbia*, provided it be not inserted straight into the stone, does not crack the marble, but just chips off as lightly as possible whatever may be necessary; while with the *scarpello a tacca* the rough edges may then be brought to an even plane, and you go over the work with it just as if you were making a drawing for the surface. And this truly is the right method, and the one which the great Michelangelo employed. Some have tried other ways, and thinking to have their work done quicker have sought to get their figure out by taking a bit off first in one place and then in another, but it took them all the longer in the end, and wasn't near so good.[442]

As these written records make clear, the unfinished works of art allow the beholder to see the method undertaken by the artist (in this case, Michelangelo) in creating the work of art and, consequently, to understand and learn the proper process of image-making. Because the figures of these statues are half emerged from the blocks of marble and the signs of the chisels are well visible, the sculptures are perceived incomplete by the observer. I argue that the beholder who perceives works of art as

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[441] Benvenuto Cellini, *Della scultura*, in id., *Opere*, ed. by Giuseppe Guido Ferrero (Turin: Unione tipografico-editrice torinese, 1971), p. 789: "E da poi che uno si sia satisfatto nel sopradetto modello, si debbe pigliare il carbone e disegnare la veduta principale della sua statua di sorte che la sia ben disegnata; perché chi non si risolvessi bene al disegno, talvolta si potria trovare ingannato da' ferri. E il miglior modo che si sia mai visto è quello che ha usato il gran Michelagnolo: il qual modo si è, di poi che uno ha disegnato la veduta principale, si debba per quella banda cominciare a scoprire con la virtù de' ferri come se uno volessi fare una figura di mezzo rilievo, e così a poco a poco si viene scoprendo". Translated in Cellini, *The Treatises of Benvenuto Cellini on Goldsmithing and Sculpture*, trans. by C. R. Ashbee (New York: Dover Publications, 1967), p. 136.

[442] Cellini, *Della scultura*, p. 790: "Non voglio mancare di non avvertire quelli che non sono pratichi al marmo, per quel che la subbia si adopera, confrontando che quanto più si può si vadia in là con essa presso alla fine. Questo si è perché la detta sottilissima subbia non introna il marmo, ché non la ficcando per dritto nella pietra l'uomo spicca dal detto marmo tutto quello che e' vuole gentilissimamente; e di poi con lo scarpello a una tacca si viene a unire, e con quella si inversa come se proprio uno avessi a disegnare. E questo è il vero modo che ha usato il gran Michelagnolo; perché questi altri che hanno voluto fare altrimenti, come s'è dire cominciando a levare ora in un luogo e ora in un altro, ritondando la figura, pensando di far più presto, a questi tali è riuscito il far più tardo e manco bene". Translated in Cellini, *The Treatises of Benvenuto Cellini on Goldsmithing and Sculpture*, pp. 136-137.

unfinished is led to imagine the process of creation—namely, the gestures of the artist's hands in the act of carving the block of marble—and to grasp the direction of the working process from the front to the back. In the following sections, I suggest how this may happen in the beholder's brain-body system.

2 The Trace of the Artist and the Beholder's Response: Implied Actions and the Biological Basis of Imagination

In his *On the Optical Sense of Form*, Robert Vischer states: "When I, for instance, look at the undulations and curves in a road, my thoughts also trace them".[443] The idea that a beholder has the faculty to retrace an observed curve in his or her mind can also be applied to the visual arts. In his *Art & Illusion*, Ernst Gombrich expresses a similar concept, when he states that the "seemingly careless brushstrokes" allow beholders "to experience vicariously the very process of creation".[444] Thus, these passages seem to suggest that in mentally retracing brushstrokes, chisel strokes or other signs left by other instruments it is possible to grasp the process of creation behind a work of art.

Building on these ideas, the present section intends to cast light on the way beholders perceive uneven surfaces in sculpture. Thus, under examination is a specific kind of unfinished, that is, the one that presents a rough surface and makes the signs of the tools used by the artist well visible. An emblematic example that deserves new attention in this sense is Michelangelo Buonarroti's unfinished output. By considering Vasari's and Cellini's statements, which stress the pedagogical function of the unfinished, for its peculiarity to show the process of art creation, I intend to validate their hypotheses by focusing on specific neuroscientific research. Pertinent for this purpose is the focus on the activity of mirror neurons in relation to the contemplation of implied actions—such as the artist's gestures, no longer perceivable but that can be mentally traced through the signs left by the instruments employed by the artist on the block of marble.

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[443] Vischer, *On the Optical Sense of Form*, p. 107.
[444] Gombrich, *Art & Illusion*, p. 196.

Specific brain-body processes seem to be involved during the observation of graphic signs, that is, empathy, embodied simulation, imagination, memory, and imitation learning. The activation of imagination, I posit, establishes an empathic relationship between the observer and the work of art observed through a process of simulation of the artist's gestures. In this sense, empathy and imagination would be at the origin not only of an aesthetic experience, capable of involving the brain as well as the body of the viewer, but also of a learning activity.

The form of observation that Vasari and Cellini suggest to beginner sculptors can also occur at a pre-reflective level. Sight, indeed, can provide direct access to the object observed. It is in this sense that we discuss empathy, a phenomenon that can occur when we relate to what we see. The phenomenon of empathy can make observation an effective learning activity in numerous contexts, including the observation of unfinished works of art. The neurological implications during the observation of graphic signs, such as those left by a chisel or manual drill, may corroborate this idea, even when the artist is not working on the statue at the time of direct observation. As we will see, empirical data suggest that in observing certain traces left by an instrument, it is possible to mentally reconstruct the gesture of the hand that produced them through a process of embodied simulation and, I propose, imagination.

Three electroencephalographic studies that focus on the perception of implied action investigate the connection between the gestures of the artist's hands and the marks produced by those gestures.[445] In doing so, these experiments analyse observers' brain responses to graphic signs, such as letters, ideograms, scribbles, cuts, and brushstrokes. The first study suggests that the observation of a letter of the Roman alphabet, Chinese ideogram or meaningless scribble—all handwritten— activates the viewers' motor representation of their hands, which means that an embodied simulation is taking place.[446] A similar motor simulation of the artist's

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[445] See Umiltà et al., *Abstract Art and Cortical Motor Activation*; Heimann, Umiltà and Gallese, How the Motor-Cortex Distinguishes Among Letters, Unknown Symbols and Scribbles; and Sbriscia-Fioretti et al., *ERP Modulation during Observation of Abstract Paintings by Franz Kline*.

[446] See Heimann, Umiltà and Gallese, *How the Motor-Cortex Distinguishes Among Letters, Unknown Symbols and Scribbles*.

gesture is provoked during the observation of the cuts on canvas by Lucio Fontana and the brushstrokes on canvas by Franz Kline.[447]

The data of the experiment on the perception of digital images of three abstract paintings by Fontana—showing, respectively, one, two and three cuts on a white canvas—suggest that the observation of the cuts activates the motor system of the beholder's brain, including mirror neurons, and, consequently, an embodied simulation takes place in the viewer—namely, the simulation of the artist's gesture in making those cuts (fig. 98). The gesture of Fontana is therefore (unconsciously) imagined, or retraced, through the visualization of the cuts, thus confirming the statement of Ugo Mulas, the photographer who immortalised the moment of creation: "Seeing a picture of holes, or a picture of cuts, it is easy to imagine Fontana making the cut with a blade or the holes with an awl" (fig. 99).[448] As the authors of the study advance, this embodied simulation of the painter's gesture by the observer can be part of the aesthetic experience, based on the observation of these three works.

The last experiment, which focuses on the perception of digital images of three abstract black and white paintings by Kline—titled, respectively, *Suspended* (1953), *Painting number 2* (1954), and *Painting Number 7* (1952)—confirms the results of the previous two, that is, to observe an abstract painting—or better, every brushwork of an abstract painting—also means to unconsciously simulate the gestures performed by the painter in creating the signs.

Given the similarities, in terms of dynamism, between the graphic signs investigated in the previously mentioned experiments and the visible traces of the creative gestures on Michelangelo's sculptures, it is likely that the neuroscientific results obtained in those studies can be applied to the kind of unfinished we are examining. Indeed, the signs left by the chisel or manual drill on Michelangelo's sculptures that I have focused on can be inserted in the same category of the signs of the letters of the Roman alphabet, Chinese characters, scribbles, cuts, and marked

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[447] See Umiltà et al., *Abstract Art and Cortical Motor Activation*; and Sbriscia-Fioretti et al., *ERP Modulation during Observation of Abstract Paintings by Franz Kline*.

[448] Ugo Mulas, *La Fotografia* (Turin: Giulio Einaudi Editore, 1973), p. 100: "Vedendo un quadro di buchi, o un quadro di tagli, è facile immaginare Fontana mentre fa il taglio con una lama o i buchi con un punteruolo".

traces of brushstrokes analyzed in those experiments, inasmuch as the latter posses the same dynamic components of the network of crosshatching and the more-or-less regular dots visible on the surface of Michelangelo's statues. Therefore, we can advance the hypothesis that the observation of the signs of the tools in Michelangelo's *St Matthew* and four *Slaves* activates the motor system (including the mirror mechanism) of the viewer's brain, who, as a consequence, is facilitated to retrace—also at a pre-reflective level—in his or her brain-body system the artist's hands gestures. As a result, the beholder's attention (including an art-trained beholder) would be able to catch the information about the shape, direction, and intensity of the hits of the chisels and thereby replicate Michelangelo's artistic method.[449] If my hypothesis is confirmed, the neuroaesthetic approach would validate the pedagogical potential that Vasari and Cellini attribute to Michelangelo's unfinished.

Embodied simulation of the implied movements of the maker, which occurs during the observation of different kinds of graphic signs—including chisel and manual drill marks—reveals, as I have proposed, the imaginative potential of the unfinished. Neuroscientific evidence suggests that the mirror neuron system (the same involved in graphic signs perception) may also contribute to the domain of imagination and that imagination is a crucial mental function for visual perception and social behaviour. We possess the ability to mentally project events and simulate outcomes. When we imagine actions done by either ourselves or others—like those executed by an artist in the act of carving a piece of marble, for instance—shared midline and frontoparietal structures are activated.[450] This has led neuroscientists to believe that imagination is a common domain between the cortical midline structures and mirror neuron system.[451] In this regard, it has been observed that these brain networks might be involved in a number of imaginative processes linked with

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[449] It is worth clarifying that knowing how to imitate a method does not mean being able to reproduce the style of the work in question. In other words, succeeding in approaching the block of marble as Michelangelo did does not necessarily follow that one can automatically contribute to sculpture as Michelangelo did.

[450] See Perrine Ruby and Decety, "Effect of Subjective Perspective Taking During Simulation of Action: A PET Investigation of Agency", *Nature Neuroscience*, 4 (2001), pp. 546-550.

[451] See Uddin et al., "The Self and Social Cognition: The Role of Cortical Midline Structures and Mirror Neurons", *Trends in Cognitive Sciences*, 11 (2007), pp. 153-157.

empathy.[452] We may suppose that the inner simulation of the artist's gesture offers a clue to an empathic engagement established between the observer and the unfinished work of art observed. In other words, the attention required for the mental reconstruction of the artist's gestures leads to a process of immersion by the observer in the work contemplated, which would activate mental-body faculties such as embodied simulation and imagination.

3   The Role of Memory in Visual Perception: A Remark

In many circumstances, the activity of certain mental processes—such as prediction, mental simulation, and imagination—cannot be detached from previously acquired knowledge. A number of studies demonstrate that previous experiences, memories, and expertise play an important role in the intensity of activation of mirror mechanisms and the ensuing perceptual contents.[453] It follows that those who already possess some artistic skills—or generically understand the process of art creation— are potentially more advantaged than those who do not in learning new abilities through simple observation. The beholder's memory of a sculptor in the act of carving a block of marble, for instance, can be a determinant for imagining the specific actions that were executed in the production of those signs. The artistic skills possessed by a beholder, if any, may play a further role in this sense. In this case, (s)he will be more facilitated in improving his or her artistic competences while observing an incomplete work of art realised by a great master, as Vasari and Cellini advise.

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[452] See Decety and Sommerville, *Shared Representations between Self and Other*; Ruby and Decety, "How Would You Feel Versus How Do You Think She Would Feel? A Neuroimaging Study of Perspective-Taking with Social Emotions", *Journal of Cognitive Neuroscience*, 16 (2004), pp. 988-999; and Jackson, Meltzoff and Decety, *How Do We Perceive the Pain of Others?*.

[453] On the role of memory and background knowledge in mirror neurons activity, see Gallese, "Finding the Body in the Brain. From Simulation Theory to Embodied Simulation", in *Alvin Goldman and his Critics*, ed. by Brian P. McLaughlin and Hilary Kornblith (New York: Blackwell, 2016), pp. 297-317; Gallese, *Bodily Selves in Relation*; and Ammaniti and Gallese, *The Birth of Intersubjectivity*.

4 Observation and the Biological Basis of Imitation Learning

"Observation is always for a purpose".[454] With these words, Gombrich sought to draw attention to the role of observation in the visual arts, both of the artist and the beholder. Whereas Pliny, in the *Natural History*, recognised the pivotal role of mind during observation: "It is the mind that is the real instrument of sight and of observation; the eyes act as a sort of vessel receiving and transmitting the visible portion of the consciousness" (XI.LIV.146).[455]

We can advance that one of the purposes of observation is learning. Learning by keen observation (or by imitation through observation) has long been acknowledged as an important aspect of human learning strategy. As we will see, studies of the mirror neuron system show the existence of underestimated neural bases of learning by observation and imitation. Furthermore, it seems that this way of acquiring knowledge is very effective and efficient.

Findings suggest that mirror neurons play a crucial role in observation, particularly during the observation of goal-directed actions, allowing observers to understand the actions of others or even their own actions.[456] The fact that mirror neurons are activated during both action execution and action observation hints that they also play an important role during the imitation of the actions observed.[457] Empirical evidence suggests that during imitation three cortical areas are involved, that is, the superior temporal sulcus and the two frontoparietal mirror neuron areas.[458] This study finds confirmation in Istvan Molnar-Szakacs et al., whose experiment focuses on hand action observation and imitation.[459] The data collected in this study

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[454] Gombrich, *Art & Illusion*, p. 103.

[455] Pliny, *Natural History*, III, p. 522: "animo autem videmus, animo cernimus; oculi ceu vasa quaedam visibilem eius partem accipiunt atque tramittunt". Translated in ibid., p. 523.

[456] Giacomo Rizzolatti and colleagues introduced the concept of "action understanding" for distinguishing the function of mirror neurons. See Rizzolatti and Fadiga, *Grasping Objects and Grasping Action Meanings*; and Rizzolatti et al., *Premotor Cortex and the Recognition of Motor Actions*.

[457] See Rizzolatti, *The Mirror Neuron System and Its Function in Humans*.

[458] See Marco Iacoboni et al., "Reafferent Copies of Imitated Actions in the Right Superior Temporal Cortex", *Proceedings of the National Academy of Sciences USA*, 98 (2001), pp. 13995-13999.

[459] See Istvan Molnar-Szakacs et al., "Functional Segregation Within Pars Opercularis of the Inferior Frontal Gyrus: Evidence from fMRI Studies of Imitation and Action Observation", *Cereb Cortex*, 15 (2005), pp. 986-994.

show an activation of mirror neurons during both the observation and imitation of the action. Furthermore, a study conducted by Beatriz Calvo-Merino and colleagues, on the role of expertise and motor repertoire of the beholder in action observation, suggests that mirror neurons integrate the "observed actions of others with an individual's personal motor repertoire".[460]

These studies indicate that observers are able to imitate the actions that they already know, but what happens when a beholder observes a novel action that does not belong to his or her motor repertoire, which is, after all, the essential precondition for an imitation learning process? This question has been addressed by Giovanni Buccino and colleagues.[461] In their study, musically naive volunteers were monitored during both the observation of guitar chords (novel for them) and execution of the observed chords. In both cases, an activation of the frontoparietal mirror neuron system was registered.[462] The fact that they succeeded in correctly reproducing the guitar chords observed means that participants were able to learn novel hand actions by simply observing a model. The peculiarity of mirror neurons to enable the beholder to imitate the actions of others, the authors advance, can facilitate learning. This explains why, for instance, children are able to acquire a new action by simple observation.[463]

Going back to Michelangelo's unfinished sculptures, these neuroscientific findings might confirm, at least in part, Vasari's and Cellini's statements on the pedagogical function of the unfinished. As we have seen, the unfinished often includes important information about the process and method undertaken by the maker, as well as the tools used. Indeed, the signs on the block of marble enable the

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[460] Beatriz Calvo-Merino et al., "Action Observation and Acquired Motor Skills: An fMRI Study with Expert Dancers", *Cerebral Cortex*, 15 (2005), pp. 1243-1249. On the role of background knowledge and expertise in visual perception, see also Helena De Preester and Manos Tsakiris, "Sensitivity to Differences in the Motor Origin of Drawings: From Human to Robot", *PLoS ONE*, 9 (2014), pp. 1-10; and Calvo-Merino et al., "Seeing or Doing? Influence of Visual and Motor Familiarity in Action Observation", *Current Biology*, 16 (2006), pp. 1-6.

[461] See Buccino et al., *Neural Circuits Underlying Imitation Learning of Hand Actions*.

[462] They also observed that, in the case of learning novel hand actions and imitation of them, other neural areas, including area 46, are involved.

[463] See Priya M. Shimpia, Nameera Akhtarb and Chris Moore, "Toddlers' Imitative Learning in Interactive and Observational Contexts: The Role of Age and Familiarity of the Model", *Journal of Experimental Child Psychology*, 116 (2013), pp. 309-323.

observer to recognise the different kinds of chisels and drills used by the artist.[464] This characteristic of the unfinished—that is, to reveal the underlying layout of the sculpture through the marks left by the work tools—is likely to activate specific neurological functions similar to the ones activated during imitation learning. At this point, the beholder's imagination of the hands of the artist in the act of carving the sculpture may function as model to imitate and, therefore, establish an imitation learning process. In other words, observing an artist in the act of carving a block of marble or imagining an artist performing the same action both would activate the same brain networks—although, in imagination, I would suggest that the intensity of the activation of the brain networks would be lower than when we see the actual action. That would mean that imitation learning occurs in both situations.

However, some clarifications need to be made. That is, in this precise case, with reference to Wittgenstein, the task is not so much to imagine *the precise gesture* that Michelangelo executed, but rather to imagine *a gesture* similar to the one that Michelangelo may have performed, a gesture that one may already have in his or her own memory.[465] In other words, there is not, in Wittgensteinian terms, a *correct gesture* to be imagined to imitate Michelangelo's method. At this point, it is worth stressing that method does not mean style. In fact, to understand the working method of an artist does not necessarily mean to be able to imitate his or her unique style.

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[464] In this respect, it is remarkable that scholars are able to recognise the various tools used by the maker by simply observing the different types of traces left on the block of marble, thus enabling an understanding of the process of image-making. See Wootton et al., *The Art of Making in Antiquity*, <http://www.artofmaking.ac.uk/explore/sources/883/PR305_02_04> [accessed 9 May 2020]; and Russell, "The Roman Sarcophagus 'Industry': A Reconsideration", in *Life, Death and Representation: Some New Work on Roman Sarcophagi*, ed. by Jaś Elsner and Janet Huskinson (Berlin and Boston: Walter de Gruyter, 2011), pp. 119-147.

[465] See Ludwig Wittgenstein, *Philosophical Investigations*, trans. by G.E.M. Anscombe, P.M.S. Hacker and Joachim Schulte (Chichester, England, Malden, MA: Wiley-Blackwell, 2009), p. 100e: "Let us imagine a table, something like a dictionary, that exists only in our imagination. A dictionary can be used to justify the translation of a word X by a word Y. But are we also to call it a justification if such a table is to be looked up only in the imagination?—'Well, yes; then it is a subjective justification'.—But justification consists in appealing to an independent authority—'But surely I can appeal from one memory to another. For example, I don't know if I have remembered the time of departure of a train correctly, and to check it I call to mind how a page of the timetable looked. Isn't this the same sort of case?'—No; for this procedure must now actually call forth the correct memory. If the mental image of the timetable could not itself be tested for correctness, how could it confirm the correctness of the first memory? (As if someone were to buy several copies of today's morning paper to assure himself that what it said was true). Looking up a table in the imagination is no more looking up a table than the image of the result of an imagined experiment is the result of an experiment" (265).

What counts here is to understand (and possibly imitate) the directions and passages of his sculptural process, and this can be achieved by observing his unfinished output.

By exploring an aspect of Michelangelo's unfinished, this chapter has shed light on the potentials of unfinished works of art that present a rough surface, that is, imagination and learning. In its history, the unfinished has been mainly associated with a particular specificity, that is, the possibility to learn from skilled masters how to properly deal with marble. This would be possible by the opportunity to see, through the unfinished, the various passages of art creation—for example, the underdrawing, the *pentimenti,* and the intensity and direction of brushstrokes or chisel strokes. The pedagogical potential ascribed to the unfinished by Vasari and Cellini, we have ascertained, can be explained from a neuroscientific perspective, considering primarily the research on mirror neurons. In this way, the neuroaesthetic approach allows us not only to illustrate how the unfinished as a rough surface can be perceived by beholders, but also to offer, through the concept of imitation learning, a new interpretation of Vasari's and Cellini's passages on Michelangelo's unfinished.

Neuroscientific evidence suggests that the mirror neuron system plays a crucial role in a number of functions, including the understanding of the actions performed by others, the ability to learn by observing and imitating others, the embodied simulation process, imagination and empathy—all of which I have considered crucial for the study of the neurological responses to rough surfaces in visual works of art. As we have seen, a number of findings about mirror neurons suggest that the observation of a graphic sign—such as a chisel stroke—leads to an automatic simulation in the embodied mind of the gesture that has produced it. In this type of visual perception, mirror neuron activation, I would suggest, allows the beholder to have an understanding of the gestures—and therefore of the creative process—that the artist performed on the block of marble. In this regard, imagination seems to be linked to the concept of imitation learning. Indeed, the imagined actions may well function as a model to imitate, enabling the beholder to reproduce the artist's method of image-making.

To conclude, immersion in aesthetic response may occur in at least two different cases: (*i*) it can be the consequence of the inner simulation of the motions and emotions represented in the figures observed, and this would explain the motor and emotive responses to the work contemplated (as it is demonstrated by previous studies); or (*ii*) it can be the result of the simulation of the process of making, and this would explain the pedagogical function of the unfinished and the imaginative response to visual works of art.

CHAPTER SIX

Aesthetic Responses to "Part Missing": Face Perception, Filling-in, and Mental Imagery

A specific type of unfinished work of art poses a long-standing perceptual problem, that is, the way in which beholders internally fill in figures and forms left incomplete —for whatever reason—by the artist. In addressing this issue, this chapter investigates the neural process through which beholders complete in their minds the blank spaces present in unfinished works of art that fall into the category of "part missing". In doing so, it mainly focuses on the representation of human figures that either have no faces or with features missing.

The first section explores a group of drawings and ancient sarcophagi depicting incomplete figures, the majority of which feature, for different reasons, empty faces. The second section details the neuroscience of face perception and shows how it applies to the study of the aesthetic responses to absent faces. The third section investigates the phenomenon of neural filling-in, which refers to the process of mental completion (divided into modal and amodal) that often occurs during the observation of a portion of an object. Relevant here is the study of illusions such as the *Kanizsa triangle* or the so-called hidden Dalmatian dog figures. Finally, the fourth section analyses the phenomenon of mental imagery, devoting particular attention to the work of Stephen Kosslyn and his collaborators. It sets out from the position that the observation of blank spaces in the depiction of figures generates in the viewer mental images of complete figures.

This chapter argues that the beholder of an incomplete figure completes (consciously or unconsciously) in his or her mind the part of the figure that is absent. As neuroscientific studies show, this is mainly due to the physiology of the human brain and the function of specific neurons that allow this kind of response. This could explain why, for instance, when beholders see a work of art depicting a headless

figure, they do not identify it as the representation of a decapitated person but as an incomplete image.

1   The Concept of "Ill-Defined Area"

To address the issue of the aesthetic responses to unfinished works of art in the category "part missing", a subdivision of incomplete figures is necessary. In this sense, four categories are explored: partly hidden figures, covered faces, unfinished figures, and missing faces. The first category deals with the representation of human figures that have some of their parts *hidden* behind other objects or *missing* for realistic purposes (e.g. perspective). To the second category belong human figures that have been depicted in the act of *covering* their faces with their hands, a sign of desperation. The third category includes representations of human figures that have been left interrupted, voluntarily or not, by their makers. Finally, the last category concerns human figures that, for various reasons, have been portrayed with *missing* faces.

In all these cases, the figures in question possess an "ill-defined area", as identified by Gombrich, which stimulates the observer's participation.[466] The way in which the beholder deals with this "ill-defined area", in a biological sense, is the scope of the present chapter. Whereas Gombrich focuses, in all these cases, on the beholder's imagination, I distinguish two different types of responses to these diverse images: the *empathic* and *emotive* (and only afterwards *imaginative*) responses for the covered faces, based on the sense of sorrow felt by the beholder in response to the grief of the figure(s) observed; and the *imaginative* and *mnemonic* responses for the other types of incomplete images, based on the beholder's mental completion of the empty spaces viewed. However, this chapter centres on the representations of and responses to *covered* and *missing* faces and draws on what seem to me significant neuroscientific advances in the study of human face perception.

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[466] Gombrich, *Art & Illusion*, p. 174.

1.1 Partly Hidden Figures

Before addressing the topic of the aesthetic responses to *absent* faces, it is worth examining a frequent phenomenon that occurs in two-dimensional art (and also in real life): the representation of and response to figures that are not entirely visible. This will gradually lead us to individuate the neurological mechanism at the base of the perception of incomplete figures, the appearance of which is mainly due to one of the following: (*i*) their unfinishedness, (*ii*) the introduction of perspective in art, and (*iii*) the "necessary incompleteness of all two-dimensional representation", as described by Gombrich.[467] For these reasons, "some part of the motif will always be hidden from us, and there will always be some overlap".[468]

In the work known as the *Imagines*, Philostratus the Elder (c. 190–c. 230) describes the phenomenon in painting of "partly hidden figures". Discussing the appearance of armed men surrounding the walls of Thebes, he states that

> some are seen in full figure, others with the legs hidden, others from the waist up, then only the busts of some, heads only, helmets only, and finally just spear-points. This, my boy, is perspective; since the problem is to deceive the eyes as they travel back along with the proper receding planes of the picture.[469] (I, 4.2)

Thus, any element contained in the painting, either a part of the human body or an attribute of the soldier, is understood by the observer as a (partly hidden) man, whose invisible forms have to be imagined.

As Gombrich observes, images of this kind are very frequent in the visual arts.[470] For example, at the centre of Giotto's *Last Judgement* in the Arena Chapel in Padua there is a curious scene: an almost entirely hidden man is carrying a cross, helped by two angels at the top (fig. 2). The only visible parts of the figure are two feet (and a portion of the legs), two hands, and some hair. Suppose I am shown this image and asked what it is: in this case, I do not say "There are two feet, two hands and some hair holding a cross", but rather, "There is a man holding a cross". Thus, the fact that

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[467] Ibid., p. 176.

[468] Ibid.

[469] Philostratus the Elder, "Imagines", in Philostratus the Elder: *Imagines*, Philostratus the Younger: *Imagines*, Callistratus: *Descriptions*, trans. by Arthur Fairbanks (London and Cambridge, MA: William Heinemann and Harvard University Press, 1969), pp. 2-271 (17).

[470] Gombrich, *Art & Illusion*, pp. 177-179.

the body is entirely missing, hidden behind the cross that the man is carrying, does not prevent me from identifying, relying on the visible parts of the figure that I see, that what I am beholding is a human being.

We find a similar example of "ill-defined area" in Hubert and Jan van Eyck's *Ghent Altarpiece* (fig. 100), more precisely, in the second interior panel from the right, at the top, where it depicts a group of music-making angels with stringed instruments gathered around a pipe organ, played by two seated angels, one shown full-length in the foreground and the other located behind the organ, only partially visible. It is this latter angel that triggered Gombrich's attention:

> There is a glimpse of red and brown at the side of the organ, or rather behind it. You must know what organs are like to take the hint. It is the garment and hair of the angel working the bellows, which Jan van Eyck did not want to miss out.[471]

Thus, to realise what these reds and browns stand for—in other words, to see this almost entirely hidden figure—the beholder must know how an organ works. Only in this way, the viewer can complete in his or her mind's eye what (s)he barely glimpses. A French illumination *Book of Hours* (fig. 101) presents a similar subject, but in an inverted situation: this time the hidden image is the angel playing the manual.

The phenomenon of "partly hidden figures" can be recognised in many other scenes with different subjects. For instance, Donatello's *Herod's Banquet* (fig. 3) includes a figure—the one rushing out of the room on the right—whose presence in the relief is indicated by his legs only; and Dürer's print *The Prodigal Son* (fig. 102) comprises the tail end of a bull, on the left, suggesting that the animal has almost left the scene that the artist is depicting. All these devices testify to the desire of the artist to be a faithful imitator of reality, the aim of which is substantially achieved in its incompleteness. It is precisely here that the contribution of the viewer in the construction of the image comes into play. In fact, to understand the picture, (s)he must rely on the power of his or her visual imagination (and with it also his or her personal visual memory, visual experience, and background knowledge), which causes him or her to see an entire figure where there is only a small portion of it.

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[471] Ibid., p. 177.

A similar phenomenon also occurs in listening and reading. In his *Talks to Teachers on Psychology; and to Students on Some of Life's Ideals*, William James points out that

> When we listen to a person speaking or read a page of print, much of what we think we see or hear is supplied from our memory. We overlook misprints, imagining the right letters, though we see the wrong ones; and how little we actually hear, when we listen to speech, we realise when we go to a foreign theatre; for there what troubles us is not so much that we cannot understand what the actors say as that we cannot hear their words. The fact is that we hear quite as little under similar conditions at home, only our mind, being fuller of English verbal associations, supplies the requisite material for comprehension upon a much slighter auditory hint.[472]

In this regard, Gombrich echoes James, when he observes how greatly

> our knowledge and expectations influence our hearing. You had to know what might be said in order to hear what was said. More exactly, you selected from your knowledge of possibilities certain word combinations and tried projecting them into the noises heard.[473]

The phenomena described in these two passages (i.e. unheard words and misprints) can be gathered under the same class where the perception of "partly hidden figures" is included, since the neural mechanism involved in these kinds of perceptions is basically the same: a neural filling-in. In this sense, Gombrich states:

> We see objects only from one side and have to guess, or imagine, what lies behind. We see only one aspect of an object, and it is not very hard to work out exactly what this aspect will be from any given point.[474]

Consequently, in perceiving partly hidden figures, beholders contribute to the making of the work of art with their memory, imagination, and creativity. In this way, the complete figure is only in their minds, as a mental image, as originally conceived in the mind of the artist.

1.2 Covered Faces

If the perception of partly hidden figures requires the beholder's imagination and memory to make sense of them, the morphology of covered faces gives rise to a more

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[472] William James, *Talks to Teachers on Psychology; and to Students on Some of Life's Ideals* (London: Longmans & Co, 1899), p. 159.
[473] Gombrich, *Art & Illusion*, p. 171.
[474] Ibid., p. 211.

complex problem. The covered faces I refer to have not been hidden by other subjects or objects, as often happens in the category of "partly hidden figures", but rather have been covered by the hand(s) of the characters themselves, in an act of desperation. For this reason, contrarily to other hidden forms, covered faces manifest a specific meaning: the expression of an intense emotion. This phenomenon is described by three classical-era authors: Cicero, Pliny the Elder, and Quintilian.

In the *Orator*, Cicero writes:

> So also the painter[475] in portraying the sacrifice of Iphigenia, after representing Calchas as sad, Ulysses as still more so, Menelaus as in grief, felt that Agamemnon's head must be veiled, because the supreme sorrow could not be portrayed by his brush.[476] (XXII, 74)

In the scene of the sacrifice of Iphigenia something is covered and therefore absent: Agamemnon's face. This description is illustrated by a Pompeian wall painting (fig. 1), which depicts Agamemnon, on the left, in the act of covering his face with his right hand. Whether in literature or in the visual arts, the description or depiction of Agamemnon is incomplete, because the sorrow he feels in this specific scene is so great that only the reader's or beholder's imagination can grasp it.

In the *Natural History*, Pliny the Elder describes the same subject matter:

> To return to Timanthes—he had a very high degree of genius. Orators have sung the praises of his Iphigenia, who stands at the altar awaiting her doom; the artist has shown all present full of sorrow, and especially her uncle, and has exhausted all the indications of grief, yet has veiled the countenance of her father himself, whom he was unable adequately to portray.[477] (XXXV, 73)

In this passage, Pliny remarks upon the incapability of the artist to depict such grief— that of the loss of a daughter. It is in this sense that the absence of the face is justified: to avoid delimiting the expression of sorrow. Therefore, the more powerful the viewer's imagination, the greater the pain expressed by the figure.

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[475] In this passage, Cicero is referring to the work of Timanthes of Cythnos.

[476] Cicero, "Orator", in id., *Brutus, Orator*, trans. by G. L. Hendrickson and H. M. Hubbell (Cambridge, MA, and London: Harvard University Press and William Heinemann, 1939), pp. 306-509 (360): "Si denique pictor ille vidit, cum immolanda Iphigenia tristis Calchas esset, tristior Ulixes, maereret Menelaus, obvolvendum caput Agamemnonis esse, quoniam summum illum luctum penicillo non posset imitari". Translated in ibid., p. 361.

[477] Pliny, *Natural History*, IX, p. 314: "Nam Timanthis vel plurimum adfuit ingeneii. eius enim est Iphigenia oratorum laudibus celebrata, qua stante ad aras peritura cum maestos pinxisset omnes praecipueque patruum et tristitiae omnem imaginem consumpsisset, patris ipsius voltum velavit, quem digne non poterat ostendere". Translated in ibid., p. 315.

The role played by the beholder's imagination in the contemplation of covered faces is confirmed by Quintilian (c. 35–c. 100), who, in the *Institutio Oratoria*, states:

> In a picture, the full face displays the beauty; yet Apelles painted Antigonus in profile, so as to conceal the blemish of his lost eye. Are not certain things likewise to be covered up in a speech, either because they ought not to be disclosed or because they cannot be expressed adequately? This is what Timanthes of Cythnus (I think it was he) did in the picture with which he won the prize over Colotes of Teos. Having depicted, in his Sacrifice of Iphigenia, Calchas sad, Ulysses even sadder, and given Menelaus the most complete expression of grief that his art could produce, he found he had used up all his means of representing emotion and could discover no way of adequately portraying her father's face; so he covered his head in a veil, and left it to the imagination of the spectators. There is a parallel to this, surely, in Sallust's words: "As to Carthage, I think it better to say nothing than to say too little".[478] (II, 13.12-14)

Humans possess the faculty to represent in their mind's eye what painters cannot, or do not want to, depict on their canvases. This type of inner representation, which sometimes occurs during visual perception, is mentioned in antiquity by Philostratus (c. 170/2–247/50), who, in the *Life of Apollonius of Tyana*, states:

> "Well then, imitation is of two kinds, Damis. Let us hold that one kind is imitation of both the hand and the mind, and this is painting, and the other is imagination of the mind alone". "It is not of two kinds", said Damis. "The one kind we should consider more perfect, since it is painting, which can depict both with the mind and the hand, whereas the other is a part of the first, since one can comprehend and copy things in the mind without being a painter, but he cannot use his hand to represent them". "Because his hand is maimed by an injury or by disease, Damis?" asked Apollonius. "Of course not", said Damis, "but because he has never handled any kind of brush, tool, or color, and is ignorant of painting".[479] (II, 22.3)

On this basis, we can conclude that the visual representation is of two types: material representation, or visual art, and mental representation, or imagination. It is in the perception of paintings such as *The Sacrifice of Iphigenia* that both are at stake.

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[478] Quintilian, *The Orator's Education*, trans. by D. A. Russell, 5 vols (Cambridge, MA, and London: Harvard University Press, 2001), I, p. 344: "Habet in pictura speciem tota facies: Apelles tamen imaginem Antigoni latere tantum altero ostendit, ut amissi oculi deformitas lateret. Quid? non in oratione operienda sunt quaedam, sive ostendi non debent sive exprimi pro dignitate non possunt? Ut fecit Timanthes, opinor, Cythnius in ea tabula qua Coloten Teium vicit. Nam cum in Iphigeniae immolatione pinxisset tristem Calchantem, tristiorem Ulixem, addidisset Menelao quem summum poterat ars efficere maerorem: consumptis adfectibus non reperiens quo digne modo patris vultum posset exprimere, velavit eius caput et suo cuique animo dedit aestimandum. Nonne huic simile est illud Sallustianum: 'nam de Carthagine tacere satius puto quam parum dicere?". Translated in ibid., p. 345.

[479] Philostratus, *The Life of Apollonius of Tyana*, trans. and ed. by Christopher P. Jones, 3 vols (Cambridge, MA, and London: Harvard University Press, 2005), I, p. 183.

However, imagination is not the only mental faculty involved in the response to covered faces that have been designed to express intense emotions. The experience of pain, such as mourning, activates similar neural networks both in the subject experiencing that specific pain and in the observer who empathises with him or her.[480]

1.3   Unfinished Figures

The concept of "ill-defined area" can also be applied to another type of incomplete figures: those depicted in preparatory drawings. That is, figures that are partially visible not because they are in some way hidden, but because they have been left (most of the time voluntarily) unfinished by their authors. The Florentine Renaissance concept of drawing is indicative: the majority of Renaissance drawings served as preparatory sketches for much larger works, and it is in this sense that they must be understood by the viewer. These drawings present contrasting levels of finiteness because their function was to delineate an idea to be developed subsequently by use of another technique (e.g. painting or sculpture).

Drawings by artists such as Leonardo da Vinci, Michelangelo Buonarroti, and Raphael, representing for instance men with one leg only (fig. 103), or without arms (fig. 104), or without hands (fig. 105), were not intended (and they are not) to be representations of amputees, but sketches that outline the main idea of figures that will be fully realised in a later phase. In this regard, Gombrich states: "When we look at a sketch…we immediately take in the situation. We do not feel tempted for a moment to interpret its images literally".[481]

Therefore, when someone observes a drawing such as Raphael's *Studies for Three Standing Men* (fig. 106), for example, (s)he is not led to interpret the figure in the centre as a fluctuating face, but rather an incomplete human figure. The contrast between this unfinished figure and the other two on the sides, highly finished, leads

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[480] For more on the aesthetic responses to emotions, see § 3.2.5; see also Fabio Tononi, "Andrea Mantegna and the Iconography of Mourners: Aby Warburg's Notion of *Pathosformeln* and the Theory of Aesthetic Response", *IKON: Journal of Iconographic Studies*, 13 (2020), pp. 79-94.

[481] Gombrich, *Art & Illusion*, p. 194.

the beholder to immediately understand that the drawing was abandoned prior to completion. In other words, (s)he immediately grasps that the figure in the centre was intended by the artist to simulate those on the sides. It is precisely here, in this understanding, that the beholder's participation (or imagination) lies.

The *Study of a Child* (fig. 107) by Andrea del Sarto and a drawing of two *Studies for a Head in Profile* (fig. 108) by Michelangelo point to a similar (imaginative) response. Whereas in the former nothing suggests that the child is held by two arms detached from a body, the second presents the correct perception of the portion of the face at the bottom in the representation of an entire version of it at the top. In sum, the imagination (together with the institution of Renaissance drawing, which allows for incompleteness) causes the beholder to see a female figure holding her baby in the first drawing, and two faces in the second. It is in this sense that a portion of a body speaks for the whole.

In order to grasp the whole of an image from one of its parts, the perceiver must be equipped with a specific faculty, which Apollonius of Tyana describes in the following way: "Those who view the works of painters need the imitative faculty, since no one will praise the picture of a horse or bull unless if he has no idea of the creature represented" (II, 22.5).[482] Therefore, the imitative faculty—or projection, as Gombrich terms it—is what gives the beholder the gist of the (fragmentary) depicted scene.[483] In this way, the unfinished "can arouse the beholder's imagination", projecting on the blank screen "what is not there".[484] In other words, the memory and background knowledge that humans possess of the structure and morphology of their own bodies allows them to recognise a man or a woman even when there are only vague suggestions of the presence of figures in the picture.

This perceptual mechanism is also at the base, we may suppose, of the observation of more rough sketches, that is, drawings characterised by an immediacy of execution, such as Andrea del Sarto's *Five Studies for a Lunette with the Virgin and Child* (fig. 109), in which the figures depicted are rapidly outlined, with an extra network of lines

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[482] Philostratus, *The Life of Apollonius of Tyana*, I, p. 185.
[483] See Gombrich, *Art & Illusion*, p. 155.
[484] Ibid., p. 174.

that requires the beholder's imitative faculty in order to interpret it correctly. In this regard, Gombrich claims: "We retranslate what we see into the context of action which gave rise to the image…We understand that certain lines are not to be interpreted strictly as representations but are intended as notes of the artist's intentions".[485] Rapid strokes indicating an alternate position of an arm, for instance, do not mean that the human figure has two left arms; similarly, a female figure without a face, as in Leonardo's *Study of a Bust of a Woman* (fig. 70), does not necessarily represent a decapitated woman. This is because, as Gombrich argues, "What we read into these accidental shapes depends on our capacity to recognise in them things or images we find stored in our minds".[486] For this reason, the beholder understands that in this type of drawing "the schema assumes the form of shorthand notations which the artist will expand and fill in when the time comes".[487]

Therefore, the perception of unfinished figures in the category "part missing" allows the viewer not only to stimulate his or her imagination but also to experience the process of creation. The immediacy of preparatory drawings, characterised by a network of marks and empty spaces, causes the representation to take shape in the mind's eye of the beholder. It is in this sense that a link "between the imagination of the artist and that of his public" is established.[488] In this respect, we can agree with Gombrich that perception "is always an active process, conditioned by our expectations and adapted to situations".[489]

1.4 Missing Faces

One of the most interesting aspects of unfinished drawings in the category "part missing", for the purposes of this research, is the phenomenon of depicting human figures with missing faces. A number of drawings presenting a similar pattern by Florentine Renaissance artists such as Domenico Ghirlandaio (figs. 110–112),

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[485] Ibid., p. 194.
[486] Ibid., p. 155.
[487] Ibid., p. 144.
[488] Ibid., p. 163.
[489] Ibid., p. 148.

Leonardo da Vinci (figs. 70, 113–115), Michelangelo Buonarroti (figs. 116–120), Sebastiano del Piombo (fig. 121), Raphael (figs. 122–123), Andrea del Sarto (fig. 124), Pontormo (figs. 125–127), and Bronzino (fig. 128) are exemplary in this sense.

From this uniform pattern of unfinishedness a question arises: What lies behind this choice, if it is a choice? The answer to this question will help me to fulfil my aim, that is, to examine the effects that "acquired patterns or schemata have on the organisation of our perception".[490] Gombrich designates this specific pattern (that of faceless figures) "oval or egg shape" and considers it "the most widespread and familiar of all the diagrammatic formulas taught in the Western tradition".[491] The "egg shape formula", in which the "egg" stands for the head, serves a specific purpose for the artist, that is, to construct a face according to the laws of human proportions. In this regard, the eighteenth-century anatomist Pieter Camper explains that

> the portrait-painters of the present day, generally describe an oval upon their panel before the person to be painted sits to be drawn; make a cross in the oval, which they divide into the length of four noses, and the breadth of five eyes; and they paint the face according to these divisions to which it must be accommodated, let the proportions themselves be ever so much at variance.[492]

In the drawings under consideration here, we find different stages of the "egg shape formula". In some of them there is an oval contour (figs. 115, 118–119, 124–128), in others the oval is half traced (figs. 70, 113), in others again the artists traced an empty profile (figs. 110, 120), and in still others the drawings present no "egg shape formula" but just a void (figs. 111–112, 114, 116–117, 121–123). As these drawings suggest, sometimes in the design phase of the work, it was not necessary to define the face of the figure, but rather it was more important to single out the format of the portraiture (i.e. half-length, full figure, etc.), the position of the body and limbs, and the details of the folds of the drapery.

These representations inevitably exercise a particular effect on the perceiver, who is able to predict, automatically, the presence of a face where there is none, probably because, as Gombrich states, "we have come to accept certain forms in pictures as

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[490] Ibid., p. 144.
[491] Ibid.
[492] Petrus Camper, *The Connexion between the Science of Anatomy and the Arts of Drawing, Painting, Statuary, etc.*, trans. by T. Cogan (London: n.p., 1794), p. 94.

representing heads".[493] This is the reason why, as Gombrich pointed out and as neuroscientific research seems to prove, the beholder is lead to project a face on a blank surface—at the top of a faceless body; a face that (s)he finds stored in his or her memory. The precondition for such a neural filling-in is "that the beholder must be left in no doubt about the way to close the gap".[494]

Notably, Chinese art theorists discuss the power that, in images, *absence* has on beholders. In the *Tao of Painting*, Mai-mai Sze argues that (strategic) *absence* is expressed as a force that the beholder captures as if it were a meaningful form:

> Figures, even though painted without eyes, must seem to look; without ears, must seem to listen….There are things which ten hundred brushstrokes cannot depict but which can be captured by a few simple strokes if they are right. That is truly giving expression to the invisible.[495]

It is in the sense described by Mai-mai Sze that the beholder's imagination plays a significant role in the perception of and response to meaningful *absences* in the visual arts. Chinese art, with its characteristic abridged visual language, appeals to the observer to mentally complete, in a given blank "screen", what is not there: eyes, ears, faces, etc.

The same applies to other kinds of Chinese art forms, such as landscape design and architecture:

> When the highest point of a pagoda reaches the sky it is not necessary to show the main part of its structure. It should seem as if it is there, and yet is not there; as if it exists above and yet also exists below. Hillocks and earth mounds show only the half; the grass huts and thatched arbours should be represented only by their rough outlines.[496]

The passages so far mentioned suggest that viewers, across time and culture, possess the faculty to fill in "ill-defined (familiar) areas". This seems to be confirmed by the common phenomenon that occurs when "we project familiar images into vaguely similar shapes of clouds".[497] Similarly, the empty surface of a face is as much a part of the image as are the strokes of the pencil that define the body.

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[493] Gombrich, *Art & Illusion*, p. 148.
[494] Ibid., p. 174.
[495] Mai-mai Sze, *The Tao of Painting: A Study of the Ritual Disposition of Chinese Painting; with a Translation of the Chieh tzu yüan hua chuan; or, Mustard Seed Garden Manual of Painting, 1679–1701*, 2 vols (New York: Pantheon Books, 1956), II, pp. 250-251.
[496] Ibid., I, p. 104.
[497] Gombrich, *Art & Illusion*, p. 89.

Since I started my investigation by comparing the phenomenon of the unfinished in classical antiquity with that of the Italian Renaissance, it is worth observing that Renaissance graphic art is not the only medium in which the phenomenon of missing faces takes place. In fact, numerous ancient stone sarcophagi portray human figures with missing faces. This is the case when they include a depiction of the patron(s), usually a bas-relief on the front, represented as a half-length figure (figs. 68–69, 129–130); or a horizontal full-length statue on the cover (figs. 131–132). In all these examples, the creators indicated the shapes of the faces with mere abbreviation, awaiting the customers, who, on these occasions, never arrived.

The "egg shape formula" is more evident in these sarcophagi than in the Renaissance drawings analysed above. This is due to the specificity of the technique employed (as marble does not allow for additions) and to the fact that in sculpture the "egg shape formula" served to facilitate the artist to complete the face once a customer was found. However, as it stands, both Renaissance drawings and ancient sarcophagi present the same perceptual problem: the presence of an "ill-defined area".

To conclude, in this section I have identified families of forms that, in a way or in another, include *absences*, that is, depictions of human figures lacking busts, limbs, hands, or faces. My argument is that these types of images, though presenting different features, share a common perceptual problem, the solution of which requires the imagination of the observer. In fact, it is only by mentally completing the figures that these works of art acquire their full meaning. It is in this sort of collaboration between the artist and the beholder that Gombrich refers to in coining the concept "the beholder's share", that is, the beholder's capacity "to transform a piece of coloured canvas into a likeness of the visible world".[498]

At this point, to view the problem of the perception of (meaningful) *absences* in visual works of art in a new light, we need to consider the phenomenon of the representation of figures with missing faces in relation to the neuroscience of face perception, neural filling-in, and mental imagery. This will allow me to clarify the

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[498] Ibid., p. 246.

ways in which beholders deal with empty fields, preparatory sketches, and partly hidden figures at a biological level.

2 The Neuroscience of Face Perception

In the previous section, I analysed a series of open-ended works of art that distinguish themselves in their inclusion of a significant *absence*, suggested by incomplete forms. Since in perception "each part announces more than it contains", as Merleau-Ponty states, I argue that, in different measures, imagination and memory (both essential for mentally completing an image), observational learning (due to the pedagogical value of the unfinished), and, sometimes, felt-emotions and empathy (in the case of covered faces) form the ground of the aesthetic experience of beholders when dealing with figures that are not entirely visible.[499] In this and the following sections, I provide the scientific foundation of my argument.

2.1 The Neural Correlate of Face Processing

A number of neuroscientific studies on face perception provide evidence that perceiving a face (both in real life and in depictions) or a body in which a face is evidently missing activates similar neural networks. This may indicate that, in the second case, the beholder's visual imagination plays an important role, as Gombrich suggests: "Where is his face? As soon as we ask, we notice we are scanning the poster, looking for indications where to anchor our projection".[500]

Gombrich, in perception, assigned a significant role to the face, as if it were the most important part of the human body. More recent scientific evidence confirms his claim, indicating that "faces are among the most important visual stimuli we perceive, informing us not only about a person's identity, but also about their mood, sex, age

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[499] Merleau-Ponty, *Phenomenology of Perception*, p. 4.
[500] Gombrich, *Art & Illusion*, p. 197.

and direction of gaze".[501] Humans, while scanning a face, are able to detect this information within a fraction of a second, which is salient for normal social interactions. Moreover, it is likely that this ability has played a considerable role in the survival of the primate ancestors of modern humans.[502]

In 1997, Nancy Kanwisher and her team proposed the existence of a face module in the human brain: the fusiform face area (FFA).[503] Subsequent evidence from behavioural, neuropsychological, and neurophysiological investigations confirms that humans have specialised cognitive and neural mechanisms dedicated to the perception of faces, which mainly converge in the FFA.[504] Significantly, in the FFA, faces are processed as a distinct object category. A similar brain activity occurs during the

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[501] Nancy Kanwisher and Galit Yovel, "The Fusiform Face Area: A Cortical Region Specialized for the Perception of Faces", *Philosophical Transactions of the Royal Society of London B.*, 361 (2006), pp. 2109-2128 (2109).

[502] Ibid.

[503] See Kanwisher et al., "The Fusiform Face Area: A Module in Human Extrastriate Cortex Specialized for Face Perception", *Journal of Neuroscience*, 17 (1997), pp. 4302-4311. For a review of the studies on face perception, see Kalanit Grill-Spector et al., "The Functional Neuroanatomy of Human Face Perception", *Annual Review of Vision Science*, 3 (2017), pp. 167-196.

[504] See Winrich Freiwald, Bradley C. Duchaine and Yovel, "Face Processing Systems: From Neurons to Real-World Social Perception", *Annual Review of Neuroscience*, 39 (2016), pp. 325-346; Duchaine and Yovel, "A Revised Neural Framework for Face Processing", *The Annual Review of Vision Science*, 1 (2015), pp. 393-416; Marlene Behrmann and David C. Plaut, "Distributed Circuits, Not Circumscribed Centers, Mediate Visual Recognition", *Trends in Cognitive Sciences*, 17 (2013), pp. 210-219; Sarah Weigelt, Kami Koldewyn and Kanwisher, "Face Recognition Deficits in Autism Spectrum Disorders are Both Domain Specific and Process Specific", *PLoS ONE*, 8 (2013), pp. 1-8; David Pitcher et al., "Two Critical and Functionally Distinct Stages of Face and Body Perception", *Journal of Neuroscience*, 32 (2012), pp. 15877-15885; Elinor McKone et al., "A Critical Review of the Development of Face Recognition: Experience is Less Important than Previously Believed", *Cognitive Neuropsychology*, (2012), pp. 1-39; Po Jang Hsieh, Jaron T. Colas and Kanwisher, "Pre-Stimulus Pattern of Activity in the Fusiform Face Area Predicts Face Percepts during Binocular Rivalry", *Neuropsychologia*, 50 (2012), pp. 522-529; Elinor McKone, Kate Crookes and Kanwisher, "The Cognitive and Neural Development of Face Recognition in Humans", in *The Cognitive Neurosciences*, ed. by David Poeppel, George R. Mangun and Michael S. Gazzaniga (Cambridge, MA, and London: The MIT Press, 2009), pp. 467-482; Bruno Rossion, "Constraining the Cortical Face Network by Neuroimaging Studies of Acquired Prosopagnosia", *NeuroImage*, 40 (2008), pp. 423-426; Pamela D. Butler et al., "What's in a Face? Effects of Stimulus Duration and Inversion on Face Processing in Schizophrenia", *Schizophrenia Research*, 103 (2008), pp. 283-292; Elinor McKone, Kanwisher and Duchaine, "Can Generic Expertise Explain Special Processing for Faces?", *Trends in Cognitive Sciences*, 11 (2007), pp. 8-15; Xiong Jiang et al., "Evaluation of a Shape-Based Model of Human Face Discrimination Using fMRI and Behavioral Techniques", *Neuron*, 50 (2006), pp. 159-172; Kanwisher, "What's in a Face?", *Science*, 311 (2006), pp. 617-618; Yovel and Kanwisher, "Face Perception: Domain Specific, Not Process Specific", *Neuron*, 44 (2004), pp. 889-898; Kanwisher, "Faces and Places: Of Central (and Peripheral) Interest", *Nature Neuroscience*, 4 (2001), pp. 455-456; James V. Haxby, Elizabeth A. Hoffman and M. Ida Gobbini, "The Distributed Human Neural System for Face Perception", *Trends in Cognitive Sciences*, 4 (2000), pp. 223-233; Kanwisher and Morris Moscovitch, "The Cognitive Neuroscience of Face Processing: An Introduction", *Cognitive Neuropsychology*, 17 (2000), pp. 1-11; Jia Liu et al., "The Selectivity of the Occipitotemporal M170 for Faces", *Cognitive Neuroscience and Neuropsychology*, 11 (2000), pp. 337-341; Kanwisher, "Domain Specificity in Face Perception", *Nature Neuroscience*, 3 (2000), pp. 759-763; and Frank Tong et al., "Response Properties of the Human Fusiform Face Area", *Cognitive Neuropsychology*, 17 (2000), pp. 257-280.

perception of other categories of objects. For instance, the observation of places triggers activity in a brain area called the parahippocampal area; seeing human bodies, or parts of them, activates the extrastriate cortex; and reading words and letters activates the visual word form area.[505] Therefore, most of the time, a specific perception corresponds to a cortical area in the brain.

Among these different cases, the study of the processing of human faces has been regarded as fundamental for research into emotion perception.[506] This is because the face is an "attention-getter", that is, it is the first part of the body that people look at when they see another person and it is the part of the body to which they pay the most attention. Furthermore, faces provide key visual information that people use to discern one person from another. If a subject wants to discern the identity or gender, age or attractiveness of another person, or is listening to him or her speak, or is evaluating trustworthiness, the gaze turns inevitably to that person's face. For this reason, as de Gelder suggests, "one may speculate that distance from the other's face is one of the major determinants of what constitutes one's personal space or comfort zone".[507]

Thus, the recognition of all information linked to the face—such as age, attractiveness, emotion, gender, trustworthiness, etc.—would be dependent on the basic face-processing ability that resides in the FFA. However, other studies point to other face-selective areas in addition to the FFA. For instance, one line of research indicates the activation of the fusiform gyrus, the extrastriate occipital areas, the lateral occipitotemporal cortex, the superior temporal sulcus (STS) in the lateral temporal lobe, and the lingual gyrus, or a combination of these regions.[508]

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[505] For the neural basis of the perception of places, see Russell Epstein et al., "The Parahippocampal Place Area: Recognition, Navigation, or Encoding?", *Neuron*, 23 (1999), pp. 115-125. For the neural basis of the perception of the human body, see Paul E. Downing et al., "A Cortical Area Selective for Visual Processing of the Human Body", *Science*, 293 (2001), pp. 2470-2473. For the neural basis of the perception of written words and letters, see Stanislas Dehaene et al., "The Neural Code for Written Words: A Proposal", *Trends in Cognitive Sciences*, 9 (2005), pp. 335-341; and Laurent Cohen et al., "The Visual Word Form Area: Spatial and Temporal Characterization of an Initial Stage of Reading in Normal Subjects and Posterior Split-Brain Patients", *Brain*, 123 (2000), pp. 291-307.

[506] See De Gelder, *Emotions and the Body*.

[507] Ibid., p. 23.

[508] Ibid., p. 29.

A second line of research maintains that the neural basis of face perception involves the activity of a distributed brain network, encompassing at least two principal processing streams. The first runs from the superior colliculus and pulvinar to the amygdala and extrastriate areas, which are all involved in the rudimentary and, more importantly, unconscious processing of salient stimuli such as facial expressions.[509] The second runs from the retina via lateral geniculate nucleus to the primary visual cortex (V1) and the occipital face area (OFA), FFA, and STS, which are responsible for conscious perception.[510] Moreover, Beatrice de Gelder and colleagues suggest that the distributed model of face processing also includes the activity of subcortical structures.[511]

A third line of research considers the interaction between the responses to facial and bodily expressions. Studies on this topic assess this link by presenting face-body compounds to participants, that is, combining angry faces and fearful bodies or vice versa, in a congruent or incongruent manner.[512]

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[509] See De Gelder et al., "Decreased Differential Activity in the Amygdala in Response to Fearful Expressions in Type D Personality", *Neurophysiologie Clinique/Clinical Neurophysiologie*, 38 (2008), pp. 163-169; Alan J. Pegna et al., "Discriminating Emotional Faces without Primary Visual Cortices Involves the Right Amygdala", *Nature Neuroscience*, 8 (2005), pp. 24-25; John S. Morris et al., "Different Extrageniculostriate and Amygdala Responses to Presentation of Emotional Faces in a Cortically Blind Field", *Brain*, 124 (2001), pp. 1241-1252; De Gelder et al., "Non-Conscious Recognition of Affect in the Absence of Striate Cortex", *Neuroreport*, 10 (1999), pp. 3759-3763; and Morris et al., "A Neuromodulatory Role for the Human Amygdala in Processing Emotional Facial Expression", *Brain*, 121 (1998), pp. 47-57.

[510] See De Gelder, *Emotions and the Body*, p. 33.

[511] Ibid., pp. 33-35. See also De Gelder et al., "A Modulatory Role for Facial Expressions in Prosopagnosia", *Proceedings of the National Academy of Sciences*, 100 (2003), pp. 13105-13110.

[512] See Jan van den Stock et al., "Body Expressions Influence Recognition of Emotions in the Face and Voice", *Emotion*, 7 (2007), pp. 487-494; and Hanneke K. M. Meeren et al., "Rapid Perceptual Integration of Facial Expression and Emotional Body Language", *Proceedings of the National Academy of Sciences of the United States of America*, 102 (2005), pp. 16518-16523.

A fourth line of research has differentiated ventral from dorsal components of the brain network that deals with face perception,[513] and has also distinguished functional regions from one another within these dorsal and ventral components.[514]

A fifth line of research, which applies different neuroimaging methods—such as positron emission tomography,[515] intracranial electroencephalography,[516] and functional magnetic resonance imaging (fMRI)[517]—identifies brain regions that show higher neural responses to faces compared to other stimuli.

A sixth line of research indicates the existence of a series of face-selective regions in the ventral occipito-temporal cortex and superior temporal cortex.[518] The former

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[513] See Freiwald, Duchaine and Yovel, *Face Processing Systems*; and Pitcher, Duchaine and Vincent Walsh, "Combined TMS and fMRI Reveal Dissociable Cortical Pathways for Dynamic and Static Face Perception", *Current Biology*, 24 (2014), pp. 2066-2070.

[514] See Kendrick N. Kay, Kevin S. Weiner and Grill-Spector, "Attention Reduces Spatial Uncertainty in Human Ventral Temporal Cortex", *Current Biology*, 25 (2015), pp. 595-600; Pitcher et al., *Two Critical and Functionally Distinct Stages of Face and Body Perception*; Pitcher et al., "Differential Selectivity for Dynamic Versus Static Information in Face-Selective Cortical Regions, *NeuroImage*, 56 (2011), pp. 2356-2363; Weiner et al., "fMRI-Adaptation and Category Selectivity in Human Ventral Temporal Cortex: Regional Differences Across Time Scales", *Journal of Neurophysiology*, 103 (2010), pp. 3349-3365; Weiner and Grill-Spector, "Sparsely-Distributed Organization of Face and Limb Activations in Human Ventral Temporal Cortex", *NeuroImage*, 52 (2010), pp. 1559-1573; Christine Schiltz et al., "Impaired Face Discrimination in Acquired Prosopagnosia is Associated with Abnormal Response to Individual Faces in the Right Middle Fusiform Gyrus", *Cerebral Cortex*, 16 (2006), pp. 574-586; Rossion et al., "A Network of Occipito-Temporal Face-Sensitive Areas Besides the Right Middle Fusiform Gyrus is Necessary for Normal Face Processing", *Brain*, 126 (2003), pp. 2381-2395.

[515] See Justine Sergent, Shinsuke Ohta and Brennan MacDonald, "Functional Neuroanatomy of Face and Object Processing. A Positron Emission Tomography Study", *Brain*, 115 (1992), pp. 15-36; and Sergent and Jean-Louis Signoret, "Functional and Anatomical Decomposition of Face Processing: Evidence from Prosopagnosia and PET Study of Normal Subjects", *Philosophical Transactions of the Royal Society B*, 335 (1992), pp. 55-61.

[516] See Aina Puce, Truett Allison and Gregory McCarthy, "Electrophysiological Studies of Human Face Perception. III: Effects of Top-Down Processing on Face-Specific Potentials", *Cerebral Cortex*, 9 (1999), pp. 445-458; McCarthy et al., "Electrophysiological Studies of Human Face Perception. II: Response Properties of Face-Specific Potentials Generated in Occipitotemporal Cortex", *Cerebral Cortex*, 9 (1999), pp. 431-444; Allison et al., "Electrophysiological Studies of Human Face Perception. I: Potentials Generated in Occipitotemporal Cortex by Face and Non-Face Stimuli", *Cerebral Cortex*, 9 (1999), pp. 415-430; Allison et al., "Human Extrastriate Visual Cortex and the Perception of Faces, Words, Numbers, and Colors", *Cerebral Cortex*, 4 (1994), pp. 544-554; and Allison et al., "Face Recognition in Human Extrastriate Cortex", *Journal of Neurophysiology,* 71 (1994), pp. 821-825.

[517] See Weiner and Grill-Spector, *Sparsely-Distributed Organization of Face and Limb Activations in Human Ventral Temporal Cortex*; Mark A. Pinsk et al., "Neural Representations of Faces and Body Parts in Macaque and Human Cortex: A Comparative fMRI Study", *Journal of Neurophysiology*, 101 (2009), pp. 2581-2600; Tong et al., "Binocular Rivalry and Visual Awareness in Human Extrastriate Cortex", *Neuron*, 21 (1998), pp. 753-759; Kanwisher et al., *The Fusiform Face Area*; McCarthy et al., "Face-Specific Processing in the Human Fusiform Gyrus", *Journal of Cognitive Neuroscience*, 9 (1997) pp. 605-610; and Puce et al., "Differential Sensitivity of Human Visual Cortex to Faces, Letterstrings, and Textures: A Functional Magnetic Resonance Imaging Study", *Journal of Neurophysiology*, 16 (1996), pp. 5205-5215.

[518] See Weiner and Grill-Spector, "The Evolution of Face Processing Networks", *Trends in Cognitive Sciences*, 19 (2015), pp. 240-241; and Freiwald, Duchaine and Yovel, *Face Processing Systems*.

are associated with face perception and recognition[519] and the latter deal with the dynamic aspects of face perception.[520] From this account, it emerges that the neural basis of face recognition is composed by three regions of the ventral face network: IOG-faces (or OFA),[521] pFus-faces [also fusiform face area one (FFA-1)],[522] and mFus-faces (also referred to as FFA-2).[523] Experiments demonstrate that the responses of the regions within the ventral face network to faces are higher compared to those that correspond to a variety of other stimuli, such as limbs, bodies, animals, objects, scenes, etc.[524] This level of responses is maintained across sessions,[525] tasks,[526] and

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[519] See Fang Fang and Sheng He, "Cortical Responses to Invisible Objects in the Human Dorsal and Ventral Pathways", *Nature Neuroscience*, 8 (2005), pp. 1380-1385; Grill-Spector, Nicholas Knouf and Kanwisher, "The Fusiform Face Area Subserves Face Perception, not Generic Within-Category Identification", *Nature Neuroscience*, 7 (2004), pp. 555-562; Konstantinos Moutoussis and Zeki, "The Relationship between Cortical Activation and Perception Investigated with Invisible Stimuli", *PNAS*, 99 (2002), pp. 9527-9532; and Tong et al., *Binocular Rivalry and Visual Awareness in Human Extrastriate Cortex*.

[520] See Pitcher et al., *Differential Selectivity for Dynamic Versus Static Information in Face-Selective Cortical Regions*; Andrew J. Calder et al., "Separate Coding of Different Gaze Directions in the Superior Temporal Sulcus and Inferior Parietal Lobule", *Current Biology*, 17 (2007), pp. 20-25; Calder and Andrew W. Young, "Understanding the Recognition of Facial Identity and Facial Expression", *Nature Reviews Neuroscience*, 6 (2005), pp. 641-651; Joel Winston et al., "fMRI-Adaptation Reveals Dissociable Neural Representations of Identity and Expression in Face Perception", *Journal of Neurophysiology*, 92 (2004), pp. 1830-1839; Timothy J. Andrews and Michael P. Ewbank, "Distinct Representations for Facial Identity and Changeable Aspects of Faces in the Human Temporal Lobe", *NeuroImage*, 23 (2004), pp. 905-913; and Puce et al., "Temporal Cortex Activation in Humans Viewing Eye and Mouth Movements", *The Journal of Neuroscience*, 18 (1998), pp. 2188-2199.

[521] See Pitcher et al., "TMS Evidence for the Involvement of the Right Occipital Face Area in Early Face Processing", *Current Biology*, 17 (2007), pp. 1568-1573; and Isabel Gauthier et al., "Expertise for Cars and Birds Recruits Brain Areas Involved in Face Recognition", *Nature Neuroscience*, 3 (2000), pp. 191-197.

[522] See Pinsk et al., *Neural Representations of Faces and Body Parts in Macaque and Human Cortex*.

[523] Ibid.

[524] See Corentin Jacques et al., "Corresponding ECoG and fMRI Category-Selective Signals in Human Ventral Temporal Cortex", *Neuropsychologia*, 83 (2016), pp. 14-28; Ido Davidesco et al., "Exemplar Selectivity Reflects Perceptual Similarities in the Human Fusiform Cortex", *Cerebral Cortex*, 24 (2014), pp. 1879-1893; Marieke Mur et al., "Categorical, Yet Graded—Single-Image Activation Profiles of Human Category-Selective Cortical Regions", *The Journal of Neuroscience*, 32 (2012), pp. 8649-8662; and Eran Privman et al., "Enhanced Category Tuning Revealed by Intracranial Electroencephalograms in High-Order Human Visual Areas", *The Journal of Neuroscience*, 27 (2007), pp. 6234-6242.

[525] See Weiner and Grill-Spector, *Sparsely-Distributed Organization of Face and Limb Activations in Human Ventral Temporal Cortex*; Marius V. Peelen and Downing, "Within-Subject Reproducibility of Category-Specific Visual Activation with Functional MRI", *Human Brain Mapping*, 25 (2005), pp. 402-408; and Marc G. Berman et al., "Evaluating Functional Localizers: The Case of the FFA", *NeuroImage*, 50 (2010), pp. 56-71.

[526] See Lior Bugatus, Weiner and Grill-Spector, "Task Alters Category Representations in Prefrontal but not High-Level Visual Cortex", *NeuroImage*, 155 (2017), pp. 437-449; and Weiner and Grill-Spector, *Sparsely-Distributed Organization of Face and Limb Activations in Human Ventral Temporal Cortex*.

stimulus formats, including photographs,[527] line drawings,[528] two-tone stimuli,[529] textures,[530] and spatial frequency.[531] Finally, neurological responses to faces are maintained across image transformations such as changes to stimulus position, size, and viewpoint.

2.2   Perceiving the "Egg Shape Formula"

In the previous section, I reviewed the neuroscientific studies that have unveiled the complex neural mechanism underlying the *perception* of faces, but what happens during the *imagination* of faces? In other words, what is the neural substrate of the perception of the "egg shape formula"?

In her *Emotions and the Body*, Beatrice de Gelder states: "It is a reasonable supposition that the brain mentally completes the picture when we see a headless body or a bodiless head".[532] In this regard, the fact that we usually perceive faces and bodies together, it may be that, as de Gelder suggests, "the perception of the face and body is closely linked and that they can quickly convey the same message in a very similar way".[533] This consideration sustains the hypothesis according to which the observation of faceless bodies, such as those depicted in the works of art analysed in the preceding section, would lead the beholder to imagine the missing face, precisely because body and face are usually seen together. Therefore, the question is: What triggers the neural filling-in of what is missing?

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[527] See Ishai et al., "The Representation of Objects in the Human Occipital and Temporal Cortex", *Journal of Cognitive Neuroscience*, 12 (2000), pp. 35-51; and Kanwisher et al., *The Fusiform Face Area*.

[528] Ibid.

[529] See Nicolas Davidenko, David A. Remus and Grill-Spector, "Face-Likeness and Image Variability Drive Responses in Human Face-Selective Ventral Regions", *Human Brain Mapping*, 33 (2012), pp. 2234-2249; and Tong et al., *Response Properties of the Human Fusiform Face Area*.

[530] See Reza Farivar, Olaf Blanke and Avi Chaudhuri, "Dorsal-Ventral Integration in the Recognition of Motion-Defined Unfamiliar Faces", *The Journal of Neuroscience,* 29 (2009), pp. 5336-5342.

[531] See Patrik Vuilleumier et al., "Distinct Spatial Frequency Sensitivities for Processing Faces and Emotional Expressions", *Nature Neuroscience*, 6 (2003), pp. 624-631.

[532] De Gelder, *Emotions and the Body*, p. 38.

[533] Ibid., pp. 38-39.

In a fMRI study, Jia Liu, Alison Harris, and Nancy Kanwisher investigated the neural mechanisms underlying the perception of face components and face configurations.[534] In particular, they monitored the activity of three regions in the human ventral visual cortex that respond selectively to faces: the OFA, in the lateral inferior occipital gyri; the FFA, in the mid-fusiform gyrus; and a face-selective region in the posterior part of the STS. In other words, they examined to what extent these areas respond to facial features such as the eyes, nose, and mouth, and the T-shaped spatial configuration of these parts. The working question of their study is the following: What aspects of the face stimulus do each of these three regions respond to? The T-shaped configuration of eyes, nose, and mouth, and/or the individual parts of faces (i.e. eyes, nose, and mouth)? Put differently, how is the response of each region affected by the presence or absence of face parts?

In doing so, they measured the fMRI responses to eight face stimuli in eight different configurations: (*i*) face parts in oval shape with hair on the top and sides; (*ii*) face parts without oval shape; (*iii*) face parts covered by black ovals in oval shape with hair on the top and sides; (*iv*) face parts covered by black ovals without oval shape; (*v*) face parts rearranged in an irregular way (i.e. the eyes in place of mouth and nose etc.) in oval shape with hair on the top and sides; (*vi*) face parts rearranged in an irregular way without oval shape; (*vii*) face parts covered by black ovals rearranged in an irregular way; and (*viii*) face parts covered by black ovals rearranged in an irregular way without oval shape. The choice to crop the face in a rectangular shape, in a way that shows the central face region only, is due to the interaction that may occur between the processing of face contour (i.e. hairline, chin, ears) and the processing of internal face features.[535]

The data collected from the Liu, Harris, and Kanwisher's experiment indicates that the FFA, the OFA, and the fSTS responses are significantly higher when real face parts, rather than black ovals, are present. An important aspect that emerged from the experiment and that supports the argument of this chapter—that is, that the

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[534] See Liu, Alison Harris and Kanwisher, "Perception of Face Parts and Face Configurations: An fMRI Study", *Journal of Cognitive Neuroscience*, 22 (2009), pp. 203-211.
[535] See Pawan Sinha and Tomaso Poggio, "I Think I Know that Face", *Nature*, 384 (1996), p. 404.

observation of a face contour without internal features, in other words, the "egg shape formula", activates the beholder's imagination to fill in the empty face—is that "the FFA showed a significantly larger response to stimuli with face configurations regardless of whether face parts were present".[536] Furthermore, the FFA responds to face-like configurations of ovals. In this respect, the scholars state that

> all three face-selective regions are sensitive to the external contours of faces suggests that this aspect of faces is also used for constructing the representation of faces at different stages of face processing. Indeed, when fine-grained details of the internal face features are missing, the coarse information of external features may help to detect faces among objects.[537]

Finally, the FFA, the OFA, and the fSTS are also active during the observation of absent parts of the face—though in this case the activity of the three areas is lower than during the observation of the face parts—but each with different intensity.[538]

On the basis of this evidence, we can advance with more certainty that the activation of these three regions during the observation of external features of the face (also when the internal parts are missing) may be at the base of the imagination of the (complete) face. An analysis of the brain mechanisms underlying the so-called neural filling-in and mental imagery may help further to corroborate this thesis.

3 Neural Filling-in

In his paper titled *Perceiving Nothings*, Roy Sorensen states that "to perceive is to perceive something. Unless we are merely hallucinating, the object of perception must be an appropriate cause of the perceptual experience. So we cannot perceive nothing. Thus the perception of absence reduces to the absence of perception".[539] Certainly, we cannot perceive an *absence* per se. But what happens when that *absence* is part of, or surrounded by, a *presence* (as happens, for example, in some of the works of art analysed in the first section)? In this case, I argue, we can perceive an *absence*, or,

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536 Liu, Harris and Kanwisher, *Perception of Face Parts and Face Configurations*, p. 207.
537 Ibid., p. 209. See also David Cox, Ethan Meyers and Pawan Sinha, "Contextually Evoked Object-Specific Responses in Human Visual Cortex", *Science*, 304 (2004), pp. 115-117.
538 See Liu, Harris and Kanwisher, *Perception of Face Parts and Face Configurations*, p. 206.
539 Roy Sorensen, "Perceiving Nothings", in *Oxford Handbook of Perception*, ed. by Mohan Matthen (Oxford: Oxford University Press, 2015), pp. 542-563 (542).

better yet, we perceive that something is missing. In fact, as Sorensen continues: "Yet we see shadows (absence of light), hear silence (absence of sound), and feel holes (absence of matter). These perceptual reports are common in ordinary life and in science".[540] In a picture, information and content are two different concepts. If the former refers to what is present, what we see, the latter may include what is absent, what we do not see, in other words, what we can imagine. It is in this sense that we discuss the "neural filling-in".

Neural filling-in is a perceptual phenomenon in which visual features such as colour, brightness, texture, and motion are perceived in certain areas of the visual field even though these features are not physically present.[541] Filling-in occurs in various situations and is an essential part of the normal surface perception among humans. When a subject faces an image of this kind, one possibility is that his or her visual system simply ignores the lack of visual input; in this case filling-in is a passive outcome. However, various psychophysical experiments show that some neural activity occurs during filling-in, particularly in the early visual cortical areas.[542]

3.1 Perceptual Completion

In their 1998 target article, Luiz Pessoa, Evan Thompson, and Alva Noë address the problem of perceptual completion in a comprehensive manner.[543] Visual scientists employ the terms *perceptual completion* to refer to situations in which subjects report that a form is *present* in a particular region of the visual field when it is actually *absent* from that region.[544] This is due to the specific morphology of the surrounding area of the empty space. In neuroscience this phenomenon is also called *neural filling-in* and it indicates the mechanism that is activated in the brain when, in certain

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[540] Ibid., p. 542.

[541] See Hidehiko Komatsu, "The Neural Mechanisms of Perceptual Filling-in", *Nature Reviews Neuroscience*, 7 (2006), pp. 220-231.

[542] See Masayuki Matsumoto and Komatsu, "Neural Responses in the Macaque V1 to Bar Stimuli with Various Lengths Presented on the Blind Spot", *Journal Neurophysiology*, 93 (2005), pp. 2374-2387; and Mario Fiorani et al., "Dynamic Surrounds of Receptive Fields in Primate Striate Cortex: A Physiological Basis for Perceptual Completion", *Proceedings of the National Academy of Sciences (USA)*, 89 (1992), pp. 8547-8551.

[543] See Pessoa, Thompson and Noë, *Finding out about Filling-in*.

[544] Ibid., p. 723.

visual situations, it completes the information that is missing. In this case, a neural mechanism provides information to compensate for an *absence*, *filling-in* what is incomplete.[545] In this way, specific cells in the visual cortex respond to discontinuities.[546] This may be due to the fact that there are neurons that respond more strongly to boundaries than to regions or surfaces.[547]

Scholars recognise two general divisions in the classification of *perceptual completion*: (*i*) modal completion versus amodal completion; and (*ii*) boundary completion versus featural completion. The first division, *modal completion* and *amodal completion*, has been proposed by Albert Michotte, Georges Thinés, and Geneviève Crabbé.[548] In modal completion the completed parts of the figure display the same attributes, or "modes" (e.g. brightness), as the incomplete parts. An example is the *Kanizsa triangle* (fig. 8).[549] This image presents illusory contours and a brightening within the figure that leads the beholder to perceive a white triangle above three circles and the contour of a second triangle. In this sense, it is said that the illusory contours and the central brightening are modal in character, that is, they are perceptually salient and appear to form a figure.[550] On the contrary, amodal completion refers to the phenomenon that occurs when the brain completes a figure, or an object, that is not entirely visible because it is covered by something else.[551] Thus, amodal completion denotes the perception of parts of figures, or objects, inasmuch as they lack certain visible attributes. For example, consider four discs partly occluded by four rectangles (fig. 133): although the discs are partly hidden,

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[545] Ibid., p. 724.

[546] See David H. Hubel and Torsten Wiesel, "Receptive Fields and Functional Architecture of Monkey Striate Cortex", *Journal of Physiology*, 195 (1968), pp. 215-243; and Hubel and Wiesel, "Receptive Fields, Binocular Interaction and Functional Architecture in the Cat's Visual Cortex", *Journal of Physiology*, 160 (1962), pp. 106-154.

[547] See Pessoa, Thompson and Noë, *Finding out about Filling-in*, p. 724. See also Alfred L. Yarbus, *Eye Movements and Vision* (Boston, MA: Springer, 1967); and John Krauskopf, "Effect of Retinal Image Stabilization on the Appearance of Heterochromatic Targets", *Journal of the Optical Society of America*, 53 (1963), pp. 741-744.

[548] See Albert Michotte, Georges Thinés and Geneviève Crabbé, *Les compléments amodaux des structures perceptives* (Louvain: Publications Universitaires de Louvain, 1964).

[549] See Gaetano Kanizsa, *Organization in Vision: Essays in Gestalt Perception* (New York: Praeger Press, 1979); and Kanizsa, "Margini quasi-percettivi in campi con stimolazione omogenea", *Rivista di Psicologia*, 49 (1955), pp. 7-30.

[550] See Pessoa, Thompson and Noë, *Finding out about Filling-in*, p. 728.

[551] See Kanizsa and Walter Gerbino, "Amodal Completion: Seeing or Thinking?", in *Organization and Representation in Perception,* ed. by Jacob Beck (Hillsdale, NJ: Lawrence Erlbaum Associates, 1982), pp. 167-190. For more on amodal completion, see fn. 3.

they are easily recognisable and are seen as lying underneath the rectangles. In this sense, the parts of the circles occluded by the rectangles are said to be *amodally* present.[552]

Therefore, modal completion is the mental completion in the foreground; whereas amodal completion is the mental completion in the background, that is, of partly hidden figures or objects. In this regard, Pessoa, Thompson, and Noë state, "a profitable approach to these issues would be to determine to what extent modal and amodal completion involve common mechanisms".[553] To this end, in a series of studies that examine illusory contours and partly hidden figures (among other stimuli), Philip Kellman and Thomas Shipley have gathered evidence showing the involvement of common interpolation mechanisms in these kinds of perceptions.[554]

The second division, *boundary completion*—which occurs during the observation of images with illusory contours—and *featural completion*—which occurs during the observation of images featuring colour, brightness, motion, texture, and depth, has been proposed by Stephen Grossberg and Ennio Mingolla.[555] Illusory figures exemplify this type of distinction. In fact, the *Kanizsa triangle*, for instance, includes both boundary completion—inasmuch as the mental completion of the illusory contours creates a triangular outline in the observer's mind—and featural completion —that is, the illusory brightening within the white triangle compared with the background in the absence of any luminance difference.

In this regard, Pessoa, Thompson, and Noë also distinguish between two different types of illusory contours: edge-induced illusory contours and line-induced illusory contours.[556] Edge-induced illusory contours are elements containing edges or gaps, consistent with an occluding figure of the same luminance as the background. On the

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[552] See Pessoa, Thompson and Noë, *Finding out about Filling-in*, p. 728.
[553] Ibid., pp. 729-730.
[554] See Philip J. Kellman and Thomas F. Shipley, "A Theory of Visual Interpolation in Object Perception", *Cognitive Psychology*, 23 (1991), pp. 141-221.
[555] See Stephen Grossberg, "Cortical Dimensions of Three-Dimensional Form, Color, and Brightness Perception: II. Binocular Theory", *Perception and Psychophysics*, 41 (1987), pp. 117-158; Grossberg, "Cortical Dynamics of Three-Dimensional Form, Color, and Brightness Perception: I. Monocular Theory", *Perception and Psychophysics*, 41 (1987), pp. 87-116; and Grossberg and Ennio Mingolla, "Neural Dynamics of Form Perception: Boundary Completion, Illusory Figures, and Neon Color Spreading", *Psychological Review*, 92 (1985), pp. 173-211.
[556] See Pessoa, Thompson and Noë, *Finding out about Filling-in*, p. 731.

other hand, line-induced illusory contours are typically thin and perpendicular to the associated illusory contours. Once again, the *Kanizsa triangle* presents both types of inducers: the three black incomplete circles act as edge inducers, whereas the thin lines work as line-end inducers.

Upon consideration of these distinctions, we are ready to address the following question: What is the neural mechanism of the filling-in? Two lines of evidence suggest the existence of a neural mechanism responsible for illusory contour completion: neurophysiological data and psychophysical research on the similarities between real and illusory contours. Regarding neurophysiologic evidence, Esther Peterhans and Rudiger von der Heydt have found evidence from single-cell recordings that suggest neural correlates of illusory contours in area V2 of the macaque monkey. Almost half of the cells that they have examined showed responses to edge-induced illusory contours and line-induced illusory contours.[557] Although linking single-cell activities and perceptual phenomena is problematic, the data collected by Esther Peterhans and Rudiger von der Heydt suggests that the perception of illusory boundaries involves the neural filling-in of a presence, rather than *ignoring an absence*. In this regard, Gregory W. Lesher describes these findings as the

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[557] See Esther Peterhans and Rudiger von der Heydt, "Mechanisms of Contour Perception in Monkey Visual Cortex. II. Contours Bridging Gaps", *Journal of Neuroscience*, 9 (1989), pp. 1749-1763; Von der Heydt and Peterhans, "Mechanisms of Contour Perception in Monkey Visual Cortex. I. Lines of Pattern Discontinuity", *Journal of Neuroscience*, 9 (1989), pp. 1731-1748; and Von der Heydt, Peterhans and G. Baumgartner, "Illusory Contours and Cortical Neuron Responses", *Science*, 224 (1984), pp. 1260-1262. See also other studies like, for instance, W. D. Ross and Pessoa, "The Selective Integration Neural Network Model of Lightness Perception", *Proceedings of the International Conference on Neural Networks (ICNN'97)*, 1 (1997), pp. 9-12; Heiko Neumann, "Mechanisms of Neural Architecture for Visual Contrast and Brightness Perception", *Neural Networks*, 9 (1996), pp. 921-936; Karl Frederick Arrington, "Directional Filling-in", *Neural Computation*, 8 (1996), pp. 300-318; Pessoa, Mingolla and Neumann, "A Contrast- and Luminance-Driven Multiscale Network Model of Brightness Perception", *Vision Research*, 35 (1995), pp. 2201-2223; Grossberg and Dejan Todorović, "Neural Dynamics of 1-D and 2-D Brightness Perception: A Unified Model of Classical and Recent Phenomena", *Perception and Psychophysics*, 43 (1988), pp. 241-277; Jiro Hamada, "A Multistage Model for Border Contrast", *Biological Cybernetics*, 39 (1984), pp. 81-86; Michael Cohen and Grossberg, "Neural Dynamics of Brightness Perception: Features, Boundaries, Diffusion, and Resonance", *Perception and Psychophysics*, 36 (1984), pp. 428-456; Michael Davidson and John A. Whiteside, "Human Brightness Perception Near Sharp Contours", *Journal of the Optical Society of America*, 61 (1971), pp. 530-536; Gerrits and Vendrik, "Simultaneous Contrast, Filling-in Process and Information Processing in Man's Visual System", *Experimental Brain Research*, 11 (1970), pp. 411-430; Henk J. M. Gerrits, Bart J. de Haan and A. J. H. Vendrick, "Experiments with Retinal Stabilized Images. Relations between the Observations and Neural Data", *Vision Research*, 6 (1966), pp. 427-440; Gordon L. Walls, "The Filling-in Process", *Journal of the American Academy of Optometry*, 31 (1954), pp. 329-340; and Glenn A. Fry, "Mechanisms Subserving Simultaneous Contrast", *Journal of the American Academy of Optometry*, 25 (1948), pp. 162-178.

discovery of "illusory contour cells".[558] However, Von der Heydt and colleagues prefer to adopt the more cautious descriptor *illusory contour stimuli,* rather than *illusory contour cells*.[559] Furthermore, they borrow the term *anomalous contours* from Kanizsa to define a stimulus property without reference to perception.[560]

Other psychophysical studies point to a common early treatment of both real and illusory contours by the visual system.[561] For instance, Andrew Smith and Ray Over have found evidence showing similarities between the two types of contours in the realm of motion aftereffects, tilt aftereffects, orientation discrimination, and orientation masking.[562] A tilt aftereffect, for example, occurs when a subject observes for a few seconds lines oriented counter clockwise from the vertical, and subsequently is exposed to an image showing vertical lines: for the persisting effect received from the former image, the latter one will appear to him or her to be tilted clockwise. There is compelling evidence showing that tilt aftereffects cross over between real and illusory contours.[563] Following this logic, adaptation with real lines can affect the perception of illusory contours. In this sense, the data shows a functional equivalence of real and illusory contours in the operation of the visual system.[564] Thus, these results demonstrate that the perception of real and illusory contours share internal processes at an early level of the visual system.

From these considerations, we can deduce that, as Pessoa and collaborators state, the perception of objects is determined not only by visual processing but also by

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[558] See Gregory W. Lesher, "Illusory Contours: Toward a Neurally Based Perceptual Theory", *Psychonomic Bulletin and Review*, 2 (1995), pp. 279-321.

[559] See Von der Heydt, Peterhans and Baumgartner, *Illusory Contours and Cortical Neuron Responses*.

[560] See Kanizsa, *Margini quasi-percettivi in campi con stimulazione omogenea*; and Kanizsa, *Organization in Vision*.

[561] See Lesher, *Illusory Contours*; and Lothar Spillmann and Birgitta Dresp, "Phenomena of Illusory Form: Can We Bridge the Gap Between Levels of Explanation?", *Perception*, 24 (1995), pp. 1333-1364.

[562] See Andrew T. Smith and Ray Over, "Motion Aftereffect with Subjective Contours", *Perception and Psychophysics*, 25 (1979), pp. 95-98; Smith and Over, "Orientation Masking and the Tilt Illusion with Subjective Contours", *Perception*, 6 (1977), pp. 441-447; Smith and Over, "Color-Selective Tilt Aftereffects with Subjective Contours", *Perception and Psychophysics*, 20 (1976), pp. 305-308; and Smith and Over, "Tilt Aftereffects with Subjective Contours", *Nature*, 257 (1975), pp. 581-582.

[563] See Mark A. Berkley, Bart Debruyn and Guy Orban, "Illusory, Motion, and Luminance-Defined Contours Interact in the Human Visual System", *Vision Research*, 34 (1994), pp. 209-216; and Michael A. Paradiso, Shinsuke Shimojo and Ken Nakayama, "Subjective Contours, Tilt-Aftereffects, and Visual Cortical Organization", *Vision Research*, 29 (1989), pp. 1205-1213.

[564] See Table 1 of Lesher, *Illusory Contours*; and Spillmann and Dresp, *Phenomena of Illusory Form*, p. 1347.

expectations formed through prior interactions with similar objects.[565] This seems to be confirmed by the morphologies of and responses to the partly hidden figures and the unfinished figures discussed in the first section of this chapter, figures in which a part of the body speaks for the whole.

3.2 Incomplete Figures and Filling-in Cells

The studies so far have considered the neural mechanisms that underpin the perceptual completion that may occur during the observation of illusory figures such as the *Kanizsa triangle*. This overview may cast some light on the way beholders respond to incomplete figures such as those analysed in the first section of this chapter. In this respect, I propose that the type of completion that takes place in the observer's brain during the observation of figures depicting human bodies with missing faces (figs. 70, 110–132) or limbs (figs. 103–105) is modal, inasmuch as in modal completion images present illusory contours. In this regard, most often, the illusory contours of a face or limb are perceptually salient and appear to complete an unfinished figure. An example in this sense may be offered by the so-called *Hidden Dalmatian Dog Illusion* (fig. 49), which shows a series of spots that make up a Dalmatian dog without contours. Once the viewer recognises the dog, (s)he can perceive its (illusory) contours. As Bence Nanay states, "before you get to see the dog, you do not see these illusory contours—you see them only once you see the dog in the picture".[566]

On the other hand, I argue, amodal completion may occur during the contemplation of partly hidden figures, inasmuch as amodal completion takes place when the beholder's mind completes a figure that is covered by another figure or object. This may happen, for instance, during the observation of the almost entirely

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[565] See Pessoa, Thompson and Noë, *Finding out about Filling-in*, p. 754. See also Xuyan Yun, Simon J. Hazenberg and Rob van Lier, "Temporal Properties of Amodal Completion: Influences of Knowledge", *Vision Research*, 145 (2018), pp. 21-30; Siyi Chen, Hermann J. Müller and Markus Conci, "Amodal Completion in Visual Working Memory", *Journal of Experimental Psychology*, 42 (2016), pp. 1344-1353; and Hyunkyu Lee and Shaun P. Vecera, "Visual Cognition Influences Early Vision: The Role of Visual Short-Term Memory in Amodal Completion", *Psychological Science*, 16 (2005), pp. 763-768.
[566] Nanay, *Aesthetics as Philosophy of Perception* (Oxford: Oxford University Press, 2016), p. 53.

hidden man behind the cross that he is carrying in Giotto's *Last Judgement* (fig. 2). In this case, the parts of the man's body hidden behind the cross are said to be *amodally present*. Furthermore, amodal completion refers to the perception of figures lacking some visible attributes, but which remain easily recognisable by the beholder.

After all, perceiving these types of incomplete figures is a matter of contour completion or surface completion. In contour completion, for example, collinear lines, edges, or fragments are perceptually grouped together by the visual system.[567] However, the phenomenon of contour completion may vary from case to case. In some cases, an illusory line may emerge perceptually, as between two collinear edges in half a Kanizsa square (fig. 134); whereas in other cases, less is visible to the naked eye. The "joining together" mechanism that underlies contour completion can be measured between any type of collinear lines and edges, which means that they can be perceptually aligned.[568] In this sense, scientific data shows that the visual system "expects" something to appear within gaps between collinear fragments, and that it is ready to fill in the missing information. For example, long-range interactions between orientation selective neurons in the visual cortex provide a convincing neurophysiological explanation of contour completion across spatial gaps.[569]

On the other hand, in surface completion, fragments of real or apparent contours give rise to perceptual closure and allow the completed regions to emerge as figures from the ground.[570] An example of this kind is the *Kanizsa triangle*. Perceptually closed surfaces usually show phenomenal properties of figural relief or depth, or have

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[567] See Birgitta Dresp, "Area, Surface, and Contour: Psychophysical Correlates of Three Classes of Pictorial Completion", *Behavioral and Brain Sciences*, 21 (1998), pp. 755-756.

[568] See Christian Wehrhahn and Dresp, "Detection Facilitation by Collinear Stimuli in Humans: Dependence on Strength and Sign of Contrast", *Vision Research*, 38 (1998), pp. 423-428; Cong Yu and Dennis M. Levi, "Spatial Facilitation Predicted with End-Stopped Spatial Filters", *Vision Research*, 37 (1997), pp. 3117-3127; Dresp and Grossberg, "Contour Integration Across Polarities and Spatial Gaps: From Contrast Filtering to Bipole Cooperation", *Vision Research*, 37 (1997), pp. 913-924; Mitesh K. Kapadia et al., "Improvement in Visual Sensitivity by Changes in Local Context: Parallel Studies in Human Observers and in V1 of Alert Monkeys", *Neuron*, 15 (1995), pp. 843-856; Dresp and Claude Bonnet, "Subthreshold Summation with Illusory Contours", *Vision Research*, 35 (1995), pp. 1071-1078; Dresp and Bonnet, "Psychophysical Measures of Illusory form Perception: Further Evidence for Local Mechanisms", *Vision Research*, 33 (1993), pp. 759-766; and Dresp and Bonnet, "Psychophysical Evidence for Low-Level Processing of Illusory Contours and Surfaces in the Kanizsa Square", *Vision Research*, 31 (1991), pp. 1813-1817.

[569] See Charles D. Gilbert and Wiesel, "The Influence of Contextual Stimuli on the Orientation Selectivity of Cells in the Primary Visual Cortex of the Cat", *Vision Research*, 30 (1990), pp. 1689-1701.

[570] See Kurt Koffka, *Principles of Gestalt Psychology* (Oxfordshire, England: Routledge, 2005).

illusory contours. As Stanley Coren and collaborators have shown, the expectations of subjects significantly influence the perception of the shape at the centre of the *Kanizsa triangle* made up by illusory contours.[571]

Furthermore, Mario Fiorani and colleagues have provided evidence for the neural basis of perceptual filling-in that allows for completion of the visual image.[572] They propose that the existence of the neural filling-in is demonstrated by the "completion neurons" firing in the visual blind spot. Ricardo Gattass and collaborators also report that the same sorts of neurons activate in response to completions behind occluders— that is, in cases of amodal completion.[573] Although more evidence is needed to talk about "filling-in cells", as Pessoa and colleagues indicated,[574] neurons responding to filling-in phenomena are a likely candidate for its underlying mechanism.[575]

Following this line of research, Lothar Spillmann and John Werner have proposed three possible neural mechanisms underlying perceptual completion and filling-in.[576] Their findings may help to answer the central question of this chapter, that is, if, during the observation of incomplete figures, neural circuits are needed for the brain to "make something out of nothing".[577] The three neural mechanisms at the basis of the perception of images presenting phenomena such as illusory contours, filling-in of brightness and colour in area contrast, and filling-in of the blind spot and scotomata that Spillmann and Werner have identified are the following:

> (*i*) A feedforward circuit in which the signals from spatially separated receptive fields converge at higher levels. An example is the proposal by Peterhans and von der Heydt…that subjective contours result from the convergence of neuronal responses to real contours (e.g. offset grating lines) and a second path that integrates these responses in a direction orthogonal to the stimulus pattern.

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[571] See Stanley Coren, Clare Porac and Leonard H. Theodor, "The Effects of Perceptual Set on the Shape and Apparent Depth of Subjective Contours", *Perception and Psychophysics*, 39 (1986), pp. 327-733.

[572] See Fiorani et al., *Dynamic Surrounds of Receptive Fields in Primate Striate Cortex*.

[573] See Ricardo Gattass et al., "Visual Responses Outside the Classical Receptive Field in Primate Striate Cortex: A Possible Correlate of Perceptual Completion", in *The Visual System from Genesis to Maturity,* ed. by Roberto Lent (Boston, MA: Birkhäuser, 1992).

[574] See Pessoa, Thompson and Noë, *Finding out about Filling-in*.

[575] See Ikuya Murakami, "A Retinotopic Representation of Filling-in: Further Supporting Evidence", *Behavioral and Brain Sciences*, 21 (1998), pp. 765-766.

[576] See Spillmann and John S. Werner, "How Do We See What is not There?", *Behavioral and Brain Science*, 21 (1998), pp. 773-774. See also Spillmann and Werner, "Long-Range Interactions in Visual Perception", *Trends in Neurosciences*, 19 (1996), pp. 428-434.

[577] Spillmann and Werner, *How Do We See What is not There?*, p. 774.

Signals from the two paths are combined so that the output is indistinguishable from the response to a real line.[578]

(*ii*)　The "gating" of long-range horizontal connections between hyper-columns that are separated by inactive cortical regions. In the absence of primary input (due to retinal lesions and, presumably, uniform retinal stimulation), these horizontal connections may provide links…that bridge the gaps between stimulated areas. In this way, the cortical representation of unstimulated regions of visual space can be "assigned" a neuronal state corresponding to the neural activity at the edges.[579]

(*iii*)　Global interactions between widely separated areas in the brain may be mediated by the synchronized discharge of neural activity rather than through dedicated circuits. Such binding by re-entrant signals from higher areas may explain some of the Gestalt factors…in which stimulus elements spaced across numerous hyper-columns are nevertheless perceived as a whole, by virtue of grouping.[580]

In this regard, Pessoa, Thompson, and Noë remark that "although the exact mechanisms of neural filling-in are unknown, what we do know suggests that they occur early in the process of vision".[581] Furthermore, the data they rely on indicates that "the perceptual completion of boundaries in illusory contours occurs as early as V2".[582]

Based upon the above, it is possible to conclude that neural filling-in gives rise to a mental image, that is, an image of a complete figure—suggested by the particular morphology of the incomplete figure observed—which can only exist in the mind's eye of the viewer.

4　Kosslyn and the Theory of Mental Imagery

When people engage with objects, they construct images in their minds similarly to when they reconstruct objects from memory.[583] These kinds of images may be conscious or unconscious.[584] Visual mental imagery plays a critical role in a wide range of everyday activities and is important in cognitive functions such as

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[578] Ibid.
[579] Ibid.
[580] Ibid.
[581] See Pessoa, Thompson and Noë, "Filling-in is for Finding Out", *Behavioral and Brain Sciences*, 21 (1998), pp. 781-796 (786).
[582] Ibid.
[583] See Damasio, *The Feeling of What Happens*, pp. 318-319.
[584] Ibid., p. 318.

learning,[585] memory,[586] and reasoning.[587] Mental images emerge from neural patterns that are formed in neurons that constitute circuits, or networks.[588] However, the way in which a neural pattern *becomes* an image is a process that neurobiology has yet to explain.

Antonio Damasio defines mental images as representations: "My mental image of a particular face is a representation, and so are the neural patterns that arise during the perceptual-motor processing of that face, in a variety of visual, somatosensory, and motor regions of the brain".[589] By this account, mental images represent, in the subject's mind and brain, the object to which the representation refer, as if the real object observed were replicated in the representation.[590] In this way, when people look at objects external to themselves, they form comparable images in their brains.[591] But this does not mean that the image they form in their minds is a copy of the object observed: "The image we see is based on changes which occurred in our organisms—including the part of the organism called brain—when the physical structure of the object interacts with the body".[592]

In this sense, it could perhaps be argued that a mental image is the result of a particular kind of response to the salient features of an object (or figure). This is because there is "a set of correspondences between physical characteristics of the object and modes of reaction of the organism according to which an internally generated image is constructed".[593] Thus, the images that subjects see in their minds are not facsimiles of the contemplated objects, but rather, they are the result of the interactions between themselves and the objects, which engage their organisms and are constructed in their neural pattern form according to the organism's design.

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[585] See Allan Paivio, *Imagery and Verbal Processes* (New York: Holt, Rinehart & Winston, 1971).
[586] See Daniel Schacter, *Searching for Memory—The Brain, the Mind, and the Past* (New York: Basic Books, 1996).
[587] See Stephen M. Kosslyn, "Mental Representation", in *Tutorials in Learning and Memory: Essays in Honor of Gordon Bower*, ed. by John Robert Anderson and Stephen M. Kosslyn (San Francisco, CA: W. H. Freeman, 1983).
[588] See Damasio, *The Feeling of What Happens*, p. 322.
[589] Ibid., p. 320.
[590] Ibid.
[591] Ibid.
[592] Ibid.
[593] Ibid., p. 321.

One important question about mental imagery is the extent to which mental images and memory are related. Several studies have contended that visual mental imagery (which involves creating, interpreting, and transforming visual mental representations, that is, "seeing with the mind's eye") and visual memory are mediated both by frontal-parietal control regions and occipital-temporal sensory regions of the brain.

In two experiments, Katie Lewis, Grégoire Borst, and Stephen Kosslyn investigated visual mental imagery "based on information in short-term memory or generated from information stored in long-term memory".[594] Based on the collected data, they claim that "mental images—based on either short-term or long-term memory—depict information".[595] Additional behavioural studies have been carried out in the attempt to solve the long standing debate about whether visual mental images rely, at least partially, on representations. The results demonstrate that subjects are capable to scan,[596] rotate,[597] and inspect[598] objects in visual mental images. This suggests that their representations possess depictive qualities.

Continuing this line of research, a fMRI study conducted by Scott Slotnick, William Thompson, and Stephen Kosslyn indicates that visual mental imagery and visual memory rely on highly similar—though not identical—cognitive processes.[599] The reason for this similarity is that "visual memory requires accessing stored visual information whereas visual mental imagery requires constructing a representation in short-term memory that is often accompanied by the experience of 'seeing with the mind's eye'".[600] According to their research, there is a common activity during visual

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[594] See Katie J. S. Lewis, Grégoire Borst and Kosslyn, "Integrating Visual Mental Images and Visual Percepts: New Evidence for Depictive Representations", *Psychological Research*, 75 (2011), pp. 259-271 (259).

[595] Ibid.

[596] See Kosslyn, Thomas M. Ball and Brian J. Reiser, "Visual Images Preserve Metric Spatial Information: Evidence from Studies of Image Scanning", *Journal of Experimental Psychology: Human Perception and Performance*, 4 (1978), pp. 47-60.

[597] See Roger N. Shepard and Jacqueline Metzler, "Mental Rotation of Three-Dimensional Objects", *Science*, 171 (1971), pp. 701-703.

[598] See Kosslyn, "Information Representation in Visual Images", *Cognitive Psychology*, 7 (1975), pp. 341-370.

[599] See Scott D. Slotnick, William L. Thompson and Kosslyn, "Visual Memory and Visual Mental Imagery Recruit Common Control and Sensory Regions of the Brain", *Cognitive Neuroscience*, 31 (2012), pp. 14-20 (14).

[600] Ibid.

imagination and visual memory in the frontal-parietal control regions, including the anterior frontal cortex, dorsolateral prefrontal cortex, and intraparietal sulcus. They also observed common activity in occipital-temporal visual sensory regions, including the fusiform gyrus and striate cortex. However, as the three scholars suggest, the two types of cognitive activity are not identical: "We found greater activity during memory than during imagery in parietal control regions and occipital-temporal sensory regions, and the number of different regions was greater than the number of common regions".[601] Based upon these results, we must conclude that mental imagery is not visual memory.

To further support the claim that visual mental imagery and visual memory rely on very similar cognitive processes, another study from Kosslyn's lab investigated, in four experiments, the relationship between visual mental imagery and visual working memory and to what extent both rely on depictive representations.[602] The results provided by their experiments indicate that representations used in both visual mental imagery and visual working memory depict information and that they have different functions.[603] Furthermore, visual mental imagery and visual working memory rely on representations that share the same format.[604] For example, scientific research on working memory discovered high-level areas in the posterior parietal lobes and frontal lobes,[605] which are also often activated during mental imagery.[606] Thus, perception, visuospatial working memory, and visuospatial mental imagery rely on most of the same brain areas. In this regard, Hubert Zimmer and colleagues argue that

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[601] Ibid., pp. 18-19.

[602] See Borst et al., "Representations in Mental Imagery and Working Memory: Evidence from Different Types of Visual Marks", *Memory & Cognition*, 40 (2011), pp. 204-217.

[603] Ibid.

[604] Ibid.

[605] See James B. Rowe et al., "The Prefrontal Cortex: Response Selection or Maintenance within Working Memory?", *Science*, 288 (2000), pp. 1656-1660; Bradley Postle and Mark D'Esposito, "Dissociation of Human Caudate Nucleus Activity in Spatial and Nonspatial Working Memory: An Event-Related fMRI Study", *Journal of Cognitive Neuroscience*, 11 (1999), pp. 585-597; Edward E. Smith et al., "Spatial versus Object Working Memory: PET Investigations", *Journal of Cognitive Neuroscience*, 7 (1995), pp. 337-356; and John Jonides et al., "Spatial Working Memory in Humans as Revealed by PET", *Nature*, 363 (1993), pp. 623-625.

[606] See Kosslyn, William L. Thompson and Giorgio Ganis, *The Case for Mental Imagery* (New York: Oxford University Press, 2006).

working memory is an emergent property of any cognitive process, and that it serves to retain a representation in order to continue processing.[607]

Other studies conducted in Kosslyn's lab report another important distinction between visual mental imagery and visual attention.[608] The task of visual attention is to select some information for more detailed processing, while discarding some others. Evidence suggests that both visual imagery[609] and visual attention[610] lead to increased activity in the early visual cortex, and that visual attention may enhance the performance of tasks that rely on this neural structure.[611]

But are there specific material images that facilitate mental imagery more than others? A frequent phenomenon that gives rise to mental images is the observation of forms that resemble something with which we are familiar. For example, during the contemplation of clouds or inkblots, often we seem to see faces, animals, or other identifiable objects. In this regard, a behavioural and fMRI study conducted by Joel Voss and colleagues investigated the beholders' responses to novel visual shapes (including a Elvis-like potato chip).[612] In doing this experiment, subjects found some shapes meaningful and others meaningless. Significantly, activity in the cortical regions associated with conceptual processing of real objects was relieved in subjects who experienced the shapes as meaningful. Of equal relevance, subjectively meaningless shapes elicited robust activity in the same brain areas. Furthermore, the scholars report that "during a recognition memory test, performance was associated with increased frontoparietal activity, regardless of meaningfulness".[613] On the basis of the data collected, the scientists conclude that "finding meaning in ambiguous

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[607] See Hubert D. Zimmer, Harry R. Speiser and Beate Seidler, "Spatio-Temporal Working-Memory and Short-Term Object-Locationa Tasks Use Different Memory Mechanisms", *Acta Psychologica*, 114 (2003), pp. 41-65.

[608] See Thompson, Yaling Hsiao and Kosslyn, "Dissociation between Visual Attention and Visual Mental Imagery", *Journal of Cognitive Psychology*, 23 (2011), pp. 256-263.

[609] See Kosslyn, Thompson and Ganis, *The Case for Mental Imagery*; and Kosslyn and Thompson, "When is Early Visual Cortex Activated during Visual Mental Imagery?" *Psychological Bulletin*, 129 (2003), pp. 723-746.

[610] See Michael A. Silver, David Ress and David J. Heeger, "Topographic Maps of Visual Spatial Attention in Human Parietal Cortex", *Journal of Neurophysiology*, 94 (2005), pp. 1358-1371.

[611] See Joseph B. Hopfinger and Vicki M. West, "Interactions between Endogenous and Exogenous Attention on Cortical Visual Processing", *NeuroImage*, 31 (2006), pp. 774-789.

[612] See Joel L. Voss et al., "The Potato Chip Really Does Look Like Elvis! Neural Hallmarks of Conceptual Processing Associated with Finding Novel Shapes Subjectively Meaningful", *Cerebral Cortex*, 22 (2012), pp. 2354-2364.

[613] Ibid., p. 2354.

stimuli appears to depend on conceptual evaluation and cortical processing events similar to those typically observed for known objects".[614] Therefore, "to the brain, the vaguely Elvis-like potato chip truly can provide a substitute for the King himself".[615]

The common tendency to project known figures not actually present onto a casual shape like a cloud, shadow, or inkblot is known as "pareidolia''. In such cases, the imagination plays a crucial role, as individuals conjure up a face, body part, animal, or other real-world object. In psychology, this phenomenon was investigated at length by Hermann Rorschach, who developed the well-known Rorschach test and other projective psychological measures.[616]

Ann Druyan and Carl Sagan argue that pareidolia often involves the false perception of faces rather than other objects.[617] For this reason, the phenomenon of pareidolia has been mainly investigated in studies on face perception. For example, Nouchine Hadjikhani and collaborators show that the brain network involved in face perception is also activated during the observation of forms configured to vaguely resemble faces but not to the same forms configured differently.[618] On the basis of all these findings, Joel Voss and colleagues suggest that "pareidolia might be such a compelling experience because the process of identifying conceptual meaning in novel or nonsense figures is essentially the same as identifying meaning in familiar real-world objects".[619]

Along this line of research, Kathleen O'Craven and Nancy Kanwisher ask: "What happens in the brain when you conjure up a mental image in your mind's eye?".[620] Adopting fMRI experiments, they provide evidence showing that the mental imagery

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[614] Ibid.
[615] Ibid.
[616] See Hermann Rorschach, *Psychodiagnostics: A Diagnostic Test Based on Perception* (Bern: Hans Huber, 1942).
[617] See Ann Druyan and Carl Sagan, *The Demon-Haunted World: Science as a Candle in the Dark* (New York: Ballantine Books, 1997).
[618] See Nouchine Hadjikhani et al., "Early (M170) Activation of Face-Specific Cortex by Face-Like Objects" *Neuroreport*, 20 (2009), pp. 403-407. See also Shlomo Bentin et al., "Priming Visual Face-Processing Mechanisms: Electrophysiological Evidence", *Psychological Science*, 13 (2002), pp. 190-193.
[619] Voss et al., *The Potato Chip Really Does Look Like Elvis!*, p. 2363.
[620] Kathleen M. O'Craven and Kanwisher, "Mental Imagery of Faces and Places Activates Corresponding Stimulus-Specific Brain Regions", *Journal of Cognitive Neuroscience*, 12 (2000), pp. 1013-1023 (1013).

of faces involves activation within a region of the cortex specialised in face perception, and that mental imagery of places activates the place-selective cortical region. Then, they "compared the activation for imagery and perception in these regions, and found greater response magnitudes for perception than for imagery of the same items".[621] As the two scientists argue, "these findings strengthen evidence that imagery and perception share common processing mechanisms, and demonstrate that the specific brain regions activated during mental imagery depend on the content of the visual image".[622]

O'Craven and Kanwisher's findings are consistent with a series of other studies that have demonstrated that mental imagery, or "seeing with the mind's eye", engages many of the same cognitive[623] and neural[624] mechanisms that are involved in visual perception. Thus, all these experiments present striking correspondence between imagery and perception, showing that many of the same regions that are selectively activated during the perception of a particular class of stimuli are also triggered during imagery of that same stimulus class.

The fact that visual mental imagery and visual perception both activate the same region suggests that it reflects some process that occurs in both. In this regard, O'Craven and Kanwisher suggest four possible candidates: "(*i*) the representation and/or perceptual analysis of the visual information, (*ii*) the semantic analysis of the

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[621] Ibid.

[622] Ibid.

[623] See Kosslyn, Katherine E. Sukel and Benjamin Martin Bly, "Squinting with the Mind's Eye: Effects of Stimulus Resolution on Imaginal and Perceptual Comparisons", *Memory and Cognition*, 27 (1999), pp. 276-287; David Gilden, Randolph Blake and Geoffry Hurst, "Neural Adaptation of Imaginary Visual Motion", *Cognitive Psychology*, 28 (1995), pp. 1-16; Ishai and Dov Sagi, "Common Mechanisms of Visual Imagery and Perception", *Science*, 268 (1995), pp. 1772-1774; Ronald A. Finke, "Theories Relating Mental Imagery to Perception", *Psychological Bulletin*, 98 (1985), pp. 236-259; Sydney Joelson Segal and Vincent Fusella, "Influence of Imaged Pictures and Sounds on Detection of Visual and Auditory Signals", *Journal of Experimental Psychology*, 83 (1970), pp. 458-464; and Cheves West Perky, "An Experimental Study of Imagination", *American Journal of Psychology*, 21 (1910), pp. 422-452.

[624] See Kosslyn et al., "The Role of Area 17 in Visual Imagery: Convergent Evidence from PET and rTMS", *Science*, 284 (1999), pp. 167-170; Kosslyn et al., "Topographical Representations of Mental Images in Primary Visual Cortex", *Nature*, 378 (1995), pp. 496-498; Per E. Roland and Balazs Gulyas, "Visual Memory, Visual Imagery, and Visual Recognition of Large Field Patterns by the Human Brain: Functional Anatomy by Positron Emission Tomography", *Cerebral Cortex*, 5 (1995), pp. 79-93; and Martha J. Farah, Michael J. Soso and Richard M. Dasheiff, "Visual Angle of the Mind's Eye Before and After Unilateral Occipital Lobectomy", *Journal of Experimental Psychology, Human Perception and Performance*, 18 (1992), pp. 241-246.

same information, or (*iii*) encoding information into or (*iv*) retrieving it from long-term memory".[625]

Further evidence about the neural processes at the basis of the visual mental imagery derives from research on patients with severe agnosias, that is, the inability to form detailed mental images of the classes of stimuli that they are unable to recognise.[626] Such impairment has been explained in terms of deficits at relatively early stages of processing that may be critical for visual recognition but not for mental imagery.[627] Other studies suggest that prosopagnosia (an impairment in face recognition) may be the result of a deficit at either a perceptual stage of processing (that is, the knowledge-independent structural encoding of faces) or a "mnestic" stage (that is, access to stored knowledge of particular faces), and that severe deficiencies in face imagery result from impairments of the latter.[628]

However, this does not mean that a prosopagnosic subject is not able to imagine faces. A study conducted by Paolo Bartolomeo and collaborators shows that a patient severely agnosic, alexic, achromatopsic, and prosopagnosic, following bilateral brain lesions in the temporo-occipital cortex, preserved her mental imagery ability for the same visual entities that she could not perceive.[629] This finding is consistent with the fact that visual mental imagery draws information from visual memory, that is, from previously stored memories. For this reason, Bartolomeo and colleagues' argue that "visual perception and visual mental imagery are subserved by independent functional mechanisms, which do not share the same cortical implementation".[630] Furthermore, the scholars state that "this clear-cut dissociation held across all the major domains of

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[625] See O'Craven and Kanwisher, *Mental Imagery of Faces and Places Activates Corresponding Stimulus-specific Brain Regions*, p. 1019.

[626] See Paolo Bartolomeo et al., "Multiple-Domain Dissociation between Impaired Visual Perception and Preserved Mental Imagery in a Patient with Bilateral Extrastriate Lesions", *Neuropsychologia*, 36 (1998), pp. 239-249.

[627] See Marlene Behrmann, Morris Moscovitch and Gordon Winocur, "Intact Visual Imagery and Impaired Visual Perception in a Patient with Visual Agnosia", *Journal of Experimental Psychology, Human Perception and Performance*, 20 (1994), pp. 1068-1087.

[628] See Andrew W. Young et al., "Recognition Impairments and Face Imagery", *Neuropsychologia*, 32 (1994), pp. 693-702; and Hadyn D. Ellis, "Past and Recent Studies of Prosopagnosia", in *Developments in Clinical and Experimental Neuropsychology*, ed. by John R. Crawford and Denis M. Parker (New York: Plenum, 1989), pp. 151-166.

[629] See Bartolomeo et al., *Multiple-Domain Dissociation between Impaired Visual Perception and Preserved Mental Imagery in a Patient with Bilateral Extrastriate Lesions*.

[630] Ibid., p. 239.

high-level vision: object recognition, reading, colour and face processing".[631] In other words, the results they gathered "suggest that mental imagery abilities need not be mediated by early visual cortices".[632]

This chapter has illustrated a fundamental problem in art making and perception, that is, the way in which perspective illusion and sketchy drawings and sarcophagi give rise to an "ill-defined area", which must be solved by the viewer in order to understand what is represented in the work of art observed. The categories of incomplete images that I have selected—that is, partly hidden figures, covered faces, unfinished figures, and missing faces—all include an absence that, very likely, activates, in the beholder's brain, a network of neurons tasked with filling-in the incomplete part with a coherent mental image. To clarify the neural process—or part of it—underlying the perception of incomplete (and illusory) figures, I have focused on the way individuals process faces, the most important part of the human body for interpersonal interactions. In this regard, as scientific data shows, the neural network associated with face perception seems to be involved during its imagination. To investigate further, I have reviewed the main studies on the neural mechanism associated with filling-in. In fact, some of the features of the images adopted in this field of research offer a possible comparison with the works of art that depict "ill-defined areas", suggesting a similar neural activity for both perceptions.

The result of such perceptions, I argue, is a visual mental image, that is, a mental representation (which may be conscious or unconscious) of the entire figure (i.e. what is visible plus what should be present). In this sense, the creation of a mental image that fills in what is missing in the work may be facilitated by previously acquired memories—in this case, the habit of observing human bodies. In my view, Slotnick and colleagues had it right—"visual memory can involve imagery of remembered items, and visual mental imagery usually involves accessing representations of previously learned stimuli".[633] In observing an incomplete form, the human brain

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[631] Ibid.
[632] Ibid.
[633] See Slotnick, Thompson and Kosslyn, *Visual Memory and Visual Mental Imagery Recruit Common Control and Sensory Regions of the Brain.*

seems to automatically overcome this absence by drawing from memory what is missing.

CONCLUSION

The Potential of the Unfinished

1. The Interpretation of the Unfinished in Terms of Imagination, Imitation Learning, and Filling-in

Let us consider the results of my investigation. At this point we should be able to answer a fundamental question that runs throughout this research: What is the power of the unfinished? I have attempted to show that the power of the unfinished involves the beholder in different ways, according to its different morphologies. That is, depending on the level of finiteness and the parts involved in the unfinishedness, it activates different mental faculties—such as imitation learning, mental imagery, neural filling-in, and memory—and brain-body mechanisms—such as embodiment and empathy.

To show this, I addressed a series of topics: (*i*) the classical and Italian Renaissance discussions about the different levels of finiteness of works of art, the unfinished, and their potentialities; (*ii*) the division of the unfinished in four categories (i.e. "almost finished", "partly finished", "sketched", and "part missing"); (*iii*) the brain-body mechanisms that may be involved in aesthetic response; (*iv*) the response to (suggested) movements in still works of art; (*v*) the response to unfinished artworks presenting a rough surface; and (*vi*) the response to unfinished artworks in the category of "part missing". In doing so, I developed the following results.

The analysis of the debate on finished and unfinished paintings and sculptures that took place in the Western tradition from classical antiquity to the Italian Renaissance allowed me to individuate an artistic canon relating to the level of finiteness of visual works of art. This debate also points to the artistic potential of the unfinished for both artists and viewers, that is, the pedagogical function, on one hand, and a correct view of the work of art (or the figures there represented), on the other.

The subdivision of the unfinished into four categories, according to the level of finiteness, allowed me to apply a more rigorous neuroscientific approach to the study of unfinished artworks than that so far undertaken. In this sense, I could show not only the power(s) of the unfinished and its potential effects on the biology of the observer, but also that there are as many responses to the unfinished as the number of its morphologies.

The study of the notion of "response" provided me with a clear understanding of the method to adopt in order to investigate the biological underpinning of the perception of images in general and the unfinished in particular. In this sense, the analysis of concepts such as "power of images", *Pathosformel*, and empathy have been extremely valuable to inquire into the forces that images exercise on the beholder's brain-body system. In fact, important developments in the neuroaesthetic approach have been facilitated by advancements in the cognitive neurosciences. The activation of specific neurons in different areas of the brain is the indicator of the brain-body responses of beholders to objects and subjects, or properties of them, both in reality and in artistic representations.

The study of the representation of and response to (suggested) movement in still works of art opened the path to my evaluation of the role that imagination plays in the aesthetic responses to images that, for one reason or another, contain incompleteness. If artists are able to succeed in representing scenes characterised by specific illusions (of lines, movements, space, perspective, etc.), this is because people are equipped with brain structures and mental faculties such as to be able to deal with them. Since static, two-dimensional works of art contain incomplete information, to reconstruct the dynamic, three-dimensional world from which the image is based, the beholder's brain needs other elements, with imagination and memory playing the main role.[634]

The study of the appearance of and response to unfinished works of art that feature a rough surface enabled me to offer a fresh interpretation of both the unfinished in one of its categories and Vasari's and Cellini's passages on unfinished works of art. This allowed me to confirm their insights about the pedagogical function

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[634] See Kandel, *The Age of Insight*, p. 203.

that unfinished sculptures may have for apprentice artists (but also for the general public), describing the brain mechanism at the base of imitation learning. In fact, the observation of marks—such as those made with chisels, drills, or brushes—may lead the observer to simulate in his or her embodied mind the gestures performed by the artist on marble during its creation and, thus, to understand the process of image-making.

The study of the appearances of and responses to incomplete figures, most of which display blank spaces, allowed me to shed new light of the unfinished in another category: "part missing". A selection of incomplete figures, that is, the representation of human figures without faces, enabled me to suggest some of the functional activity of the brain in supplying what is missing in an image. I did so by analysing the concepts of "ill-defined area", "neural filling-in" and "mental imagery" and the neurological basis of face perception. What emerges from psychological and neuroscientific studies is that the brain is inclined to fill in a gap, and thereby to make sense of an ambiguous image.

In sum, the study of the neuroscience of the perception of motions, emotions, marks, faces, human bodies, and illusory figures provided me with a clear understanding of what is likely to be involved during the perception of incompleteness. In doing so, I assigned a significant role to the beholder's imagination (conscious or unconscious), the involvement of which is indispensable to make sense of a figure that is incomplete, no matter its features. In this sense, Kandel argues that "the brain completes lines because nature often presents occulted contours that must be completed in order to perceive an image correctly".[635] This statement is confirmed by Richard Gregory, who states: "Our brains create much of what we see by adding what 'ought' to be there".[636] Furthermore, in dividing the unfinished into four different categories, I concluded that the identification of the exact neurological substrate of the perception of the unfinished, broadly speaking, is impossible to discern. Rather, what we can do is to discover the biological responses to specific

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[635] Ibid., p. 263.
[636] Richard Gregory, *Seeing Through Illusions* (Oxford and New York: Oxford University Press, 2009), p. 212.

morphologies of the unfinished, that is, "almost finished" works of art, "partly finished" works of art, figures that have been roughly sketched out, and figures that lack certain parts. In other words, what we can investigate with greater precision regarding the incompleteness is the neural mechanisms underlying the perception of rough surfaces, partly hidden figures, covered faces, unfinished figures, and missing faces.

This approach illuminates how the beholder of a visual work of art responds both to forms contained within it as well as to an image as a whole. In neuroscientific terms, it is said that subjects respond to stimulus salience, which refers to the features of objects that attract people's attention: bright colours, fast movements, a loud or distinctive sound or smell, and so on.[637] An example of stimulus salience might be the sight of a naked woman in an unexpected environment, as in Édouard Manet's *Le Déjeuner sur l'herbe* (fig. 135). Because the naked woman is surprising, and potentially important in that specific context (she is the only naked figure between two dressed men), the beholder's attention is immediately drawn to her. In general, stimuli that are novel or unexpected act to divert our attention, a process known as attentional capture. In this sense, the unfinished, I argue, is another example of stimulus salience that causes attentional capture.

The perception of such salient areas is said to rely on "bottom-up processes in which visual information is accumulated, and modified by top-down expectations", although, as Uri Hertz, Colin Blakemore, and Chris Frith point out, "it is not clear how different sources of expectations interact to affect perception".[638] The study of visual perception as a hierarchical top-down process[639] has been enriched in recent years by experimental research, pointing to the effects that expectations, predictions,

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[637] See Brian A. Anderson and Steven Yantis, "Persistence of Value-Driven Attentional Capture", *Journal of Experimental Psychology: Human Perception and Performance*, 39 (2013), pp. 6-9.

[638] Uri Hertz, Colin Blakemore and Chris D. Frith, "I Haven't a Clue! – Expectations Based on Repetitions and Hints Facilitate Perceptual Experience of Ambiguous Images", *Forthcoming*.

[639] See David C. Van Essen and John H. R. Maunsell, "Hierarchical Organization and Functional Streams in the Visual Cortex", *Trends in Neurosciences*, 6 (1983), pp. 370-375.

and prior knowledge have on visual perception.[640] In this sense, as Hertz and colleagues state, referring to the perceptual experience of ambiguous figures: "Expectations can also be formed by previous experience with the visual stimuli at hand, which increases the vividness of the perceptual experience over repeated presentations, through recollection of the stimuli".[641]

Finally, one of my goals with this research was to emphasise the commonalities that exist in art creation and perception across cultures and over time, despite the diverse cultural habits that inevitably shape human activity. My claim is consistent with what Eric Kandel writes about children's perception of images:

> Young children can interpret images because they are born with a brain whose visual system has a set of innate, universal cognitive rules for extracting sensory information from the physical world, similar to the rules that allow children to acquire grammar.[642]

In studying works of art, the ways they have been created, and the ways viewers respond to them, it is crucial to take into account both the particular and the universal aspects that shape their morphologies and forces.

2. Indications for Further Investigation

This research brought up a series of questions regarding the appearances of and responses to incompleteness, that is, what in an image is not present but should evidently be. This method to investigate images, according to the responses that they elicit in viewers, automatically leads to expand this inquiry to other types of images.

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[640] See Floris P. de Lange, Micha Heilbron and Peter Kok, "How Do Expectations Shape Perception?", *Trends in Cognitive Sciences*, 20 (2018), pp. 1-16; Christopher Summerfield and De Lange, "Expectation in Perceptual Decision Making: Neural and Computational Mechanisms", *Nature Reviews Neuroscience*, 15 (2014), pp. 745-756; Charles D. Gilbert and Wu Li, "Top-Down Influences on Visual Processing", *Nature Reviews*, 14 (2013), pp. 1-26; and Joel Pearson and Jan Brascamp, "Sensory Memory for Ambiguous Vision", *Trends in Cognitive Sciences*, 12 (2008), pp. 334-341.

[641] Hertz, Blakemore and Frith, *I Haven't a Clue!*. See also Andrea Greve et al., "Knowledge is Power: Prior Knowledge Aids Memory for both Congruent and Incongruent Events, but in Different Ways", *Journal of Experimental Psychology: General*, 148 (2019), pp. 325-341; Marlieke T. R. van Kesteren et al., "How Schema and Novelty Augment Memory Formation", *Trends in Neurosciences*, 35 (2012), pp. 211-219; and Pearson and Brascamp, *Sensory Memory for Ambiguous Vision*.

[642] Kandel, *The Age of Insight*, p. 200.

In this respect, a more comprehensive and thorough analysis of the relationship between the appearances of and responses to images should include the following topics: the aesthetic and neuroaesthetic implications of the worldwide diffusion of images in the age of digital reproduction; the representation of and responses to expressions of emotions; the representation of and responses to (suggested) movement in still works of art; the representation of and responses to erotic and pornographic images; the representation of and responses to sound or noise (i.e. music, crying, etc.) in static works of art; the appearances of and responses to the unfinished in a broader sense, that is, from classical antiquity to contemporary art; the role of different types of memory—such as hereditary memory, social (or cultural) memory, long-term memory, and short-term memory—in image-making and image perception; and the role of (negative) mental states such as apathy, distraction, anguish, boredom, disgust, discomfort, and embarrassment that people may experience in contemplating determinate scenes that increasingly surround us in a society powered by images.

A study that considers any one of these aspects could contribute to the fields of aesthetics and neuroaesthetics. More in-detail the first topic should cast new light on the ways people engage with a wide variety of images in the age of digital reproduction. The vast diffusion of images in recent years has prompted philosophers, neuroscientists, and art historians to ask new questions about the nature of images and the relationship between their morphologies and the ways observers interact with them.[643] From blockbuster exhibitions to photojournalism, from television to advertising, from films to videoclips, from social networks to the culture of selfies, today the consumption of images has radically changed from the last two millennia at least. Starting from the philosophy of Walter Benjamin, we need to employ his insights regarding the radical shift in the culture of image-making, the widespread dissemination of images, and the related modalities of perception, taking into

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[643] See, for instance, Gallese and Guerra, *The Empathic Screen*; William J. T. Mitchell, *Image Science: Iconology, Visual Culture and Media Aesthetics* (Chicago, IL: University of Chicago, 2015); Kendall Walton, *In Other Shoes: Music, Metaphor, Empathy, Existence* (Oxford and New York: Oxford University Press, 2015); Mitchell, *Cloning Terror: The War of Images, 9/11 to the Present* (Chicago, IL: University of Chicago, 2011); Barbie Zelizer, *About to Die: How News Images Move the Public* (Oxford: Oxford University Press, 2010); and Fredric Jameson, *Postmodernism, or, the Cultural Logic of Late Capitalism* (Durham, NC: Duke University Press, 1991).

consideration both the transformation of society by the digital revolution and the (neo)liberalism and advancements in the field of cognitive neuroscience.[644]

The second topic should consider the role of emotions in art, both as represented by the artist and as felt by the observer in response to them. In other words, we need to investigate further the relationship between the representation of emotions—such as those depicted in Niccolò dell'Arca's *Lamentation over the Dead Christ* (fig. 136) —and the beholder's mirroring of those same emotions or the arousal of different emotions in reaction to the work of art. We must move beyond the notion of *Pathosformel* by Aby Warburg and the theory of Nelson Goodman on the involvement of emotions in art perception and understanding, updating their insights by investigating the brain-body mechanisms at the base of the emotive response. This may involve, for example, considering the studies of neuroscientists such as Paul Ekman, Antonio Damasio, Jean Decety, Ralph Adolphs, and Vittorio Gallese, and art historians such as David Freedberg.[645]

The third topic should analyse further the ways artists have historically conveyed movement in still figures and how beholders respond to it at a biological level. The argument is that the depiction of moments caught in the unfolding of an action, through the energy of the figures' gestures—as, for example, in Edgar Degas's representations of dancers, both in painting (fig. 137) and sculpture (fig. 138)—

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[644] See Benjamin, *The Work of Art in the Age of Mechanical Reproduction*; and Benjamin, *The Arcades Project*, trans. by Howard Eiland and Kevin McLaughlin (Cambridge, MA, and London: Harvard University Press, 2002).

[645] See Warburg, *The Renewal of Pagan Antiquity*; Goodman, *Languages of Art*; Ekman, *Emotions Revealed*; Ekman, *Emotion in the Human Face*; Ekman and Friesen, *Unmasking the Face*; Damasio, *Descartes' Error*; Damasio, *Looking for Spinoza*; Damasio, *The Feeling of What Happens*; Carolyn Zahn-Waxler, Andrew Schoen and Decety, "An Interdisciplinary Perspective on the Origins of Concern for Others: Contributions from Psychology, Neuroscience, Philosophy, and Sociobiology", in *Forms of Fellow Feeling: Empathy, Sympathy, Concern and Moral Agency*, ed. by Neil Roughley and Thomas Schramme (Cambridge: Cambridge University Press, 2018), pp. 184-215; Patrick Williams et al., "Loving-Kindness Language Exposure Leads to Changes in Sensitivity to Imagined Pain", *The Journal of Positive Psychology*, (2017), pp. 1-5; Stephanie J. Dimitroff et al., "Physiological Dynamics of Stress Contagion OPEN", *Scientific Reports*, 7 (2017), pp. 1-8; Adolphs, "Recognizing Emotion From Facial Expressions; Adolphs et al., "Impaired Recognition of Emotion in Facial Expressions Following Bilateral Damage to the Human Amygdala", *Nature*, 372 (1994), pp. 669-672; Adolphs, "Neural Systems for Recognising Emotion", *Current Opinion in Neurobiology*, 12 (2002), pp. 169-177; Gallese, *Embodied Simulation. Its Bearing on Aesthetic Experience and the Dialogue Between Neuroscience and the Humanities*; Gallese, *Bodily Selves in Relation*; Gallese, *Seeing Art … Beyond Vision*; Freedberg, *From Absorption to Judgment*; Freedberg, *Feelings on Faces*; Freedberg, *Movement, Embodiment, Emotion*; Freedberg, *Immagini e risposta emotiva*; and Freedberg, *Empathy, Motion and Emotion*.

activates the beholder's imagination, which, in turn, enables a mental re-construction of the action and a visceral understanding of the image. This is mainly due to the activation of motor areas—which control the execution and perception of movements—the mirror neuron system and the consequent embodied simulation.[646] In this sense, the representation of entire scenes (in a temporal sense) in static artworks can only happen internally, in the beholder's brain-body system. As Gombrich states: "Without this tendency of ours to see potential movement in the form of anticipation, artists would never have been able to create the suggestion of speed in stationary images".[647] Hence, the artist and observer collaboration in the "creation" of images.

The fourth topic should address the relationship between the representations of and responses to erotic and pornographic images. From ancient Greek vase-painting depicting erotic scenes (fig. 139) to Pompeian erotic frescoes (fig. 140); from Chinese (fig. 141) and Japanese (fig. 142) erotic art to Western visual culture showing figures engaged in erotic positions (fig. 143) or sexual activities (figs. 144–145), erotic images and pornographic scenes pose a problem for visual perception. However, the physiological implications of this, for the most part, have yet to be investigated.[648] In this regard, the historical function of erotic images should be assessed alongside the

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[646] See Gallese, *Embodied Simulation. Its Bearing on Aesthetic Experience and the Dialogue Between Neuroscience and the Humanities*; and Gallese, *Embodied Simulation Theory*.

[647] Gombrich, *Art & Illusion*, p. 191.

[648] For ancient Greece erotic art, see Martin F. Kilmer, *Greek Erotica on Attic Red-Figure Vases* (London: Duckworth, 1993); Amy Richlin (ed.), *Pornography and Representation in Greece and Rome* (New York and Oxford: Oxford University Press, 1992); D. L. Davis and R. G. Whitten, "The Cross-Cultural Study of Human Sexuality", *Annual Review of Anthropology*, 16 (1987), pp. 69-98; and Otto Brendel, "The Scope and Temperament of Erotic Art in the Graeco-Roman World", in *Studies in Erotic Art*, ed. by Theodore Bowie et al. (New York: Basic Books, 1970), pp. 3-108. For the erotic art in Pompeii and Herculaneum, see John Clarke, *Roman Sex: 100 B.C. to A.D. 250* (New York: Harry N. Abrams, 2003); Antonio Varone, *Eroticism in Pompeii* (Los Angeles: J. Paul Getty Museum, 2001); and Luciana Jacobelli, *Le pitture erotiche delle Terme Suburbane di Pompei* (Rome: "L'Erma" di Bretschneider, 1995). For the Chinese erotic art, see Yimen, *Dreams of Spring: Erotic Art in China: From the Bertholet Collection* (Amsterdam: Pepin Press, 1997). For the Japanese erotic art, see Timothy Clark et al. (eds), *Shunga: Sex and Pleasure in Japanese Art* (London: The British Museum, 2013). For pornography and erotism in the Western visual culture, see Sabine Rewald, *Balthus: Cats and Girls* (London: Thames & Hudson 2013); Hans Werner Holzwarth (ed.), *Jeff Koons* (Köln: Taschen, 2009); Kara Vander Weg and Rose Dergan (eds), *John Currin* (New York: Gagosian Gallery, 2006); Thierry Savatier, *L'Origine du monde, histoire d'un tableau de Gustave Courbet* (Paris: Bartillat, 2006); Diana Widmaier Picasso, *Picasso: "Art Can Only Be Erotic"* (Munich and London: Prestel, 2005); Bette Talvacchia, *Taking Positions: On the Erotic in Renaissance Culture* (Princeton, NJ: Princeton University Press, 1999); Klaus Albrecht Schroder, *Egon Schiele: Eros and Passion* (Munich and New York: Prestel, 1999); Fernando Mazzocca, *Hayez privato: arte e passioni nella Milano romantica* (Turin: Umberto Allemandi, 1997); Giulio Romano et al., *I modi: The Sixteen Pleasures: An Erotic Album of the Italian Renaissance*, trans. and ed. by Lynne Lawner (Evanston, IL: Northwestern University, 1988); and Hans Hofstatter, *Gustav Klimt: Erotic Drawings* (London: Thames and Hudson 1980).

brain-body mechanisms associated with sexual arousal[649] and the human sexual

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[649] See Lara Maister et al., "The Erogenous Mirror: Intersubjective and Multisensory Maps of Sexual Arousal in Men and Women", *Archives of Sexual Behavior* (2020), pp. 1-15; Gordon G. Gallup Jr., John P. Towne and Jennifer A. Stolz, "An Evolutionary Perspective on Orgasm", *Evolutionary Behavioral Sciences*, 12 (2018), pp. 52-69; Johanna Bendas et al., "C-Tactile Mediated Erotic Touch Perception Relates to Sexual Desire and Performance in a Gender-Specific Way", *Journal of Sexual Medicine,* 14 (2017), pp. 645-653; Mylène Bolmont, Alan Pegna and Francesco Bianchi-Demicheli, "Visual Patterns of Sexual Desire. An Original and Exploratory Study in Eye-Tracking", *Sexologies*, 26 (2017), pp. e65-e70; Nan J. Wise, Eleni Frangos and Barry R. Komisaruk, "Activation of Sensory Cortex by Imagined Genital Stimulation: An fMRI Analysis", *Socioaffective Neuroscience & Psychology*, 6 (2016), p. 31481; Lauri Nummenmaa et al., "Topography of Human Erogenous Zones", *Archives of Sexual Behavior*, 45 (2016), pp. 1207-1216; Anthony F. Bogaert and Lori A. Brotto, "Object of Desire Self-Consciousness Theory", *Journal of Sex and Marital Therapy*, 40 (2014), pp. 323-338; Oliver H. Turnbull et al., "Reports of Intimate Touch: Erogenous Zones and Somatosensory Cortical Organization", *Cortex*, 53 (2014), pp. 146-154; Peter B. Gray and Justin R. Garcia, *Evolution and Human Sexual Behavior* (Cambridge, MA: Harvard University Press, 2013); Nummenmaa et al., "Gender and Visibility of Sexual Cues Influence Eye Movements While Viewing Faces and Bodies", *Archives of Sexual Behavior*, 41 (2012), pp. 1439-1451; Simone Kühn and Jürgen Gallinat, "A Quantitative Meta-Analysis on Cue-Induced Male Sexual Arousal", *Journal of Sexual Medicine*, 8 (2011), pp. 2269-2275; Christian Keysers and Valeria Gazzola, "Expanding the Mirror: Vicarious Activity for Actions, Emotions, and Sensations", *Current Opinion in Neurobiology*, 19 (2009), pp. 666-671; Andrea Serino, Giulia Giovagnoli and Elisabetta Làdavas, "I Feel what You Feel if You are Similar to Me", *PLoS ONE*, 4 (2009), p. e4930; Frederick Toates, "An Integrative Theoretical Framework for Understanding Sexual Motivation, Arousal, and Behavior", *Journal of Sex Research*, 46 (2009), pp. 168-193; Amy D. Lykins, Marta Meana and Gregory P. Strauss, "Sex Differences in Visual Attention to Erotic and Non-Erotic Stimuli", *Archives of Sexual Behavior*, 37 (2008), pp. 219-228; Heather A. Rupp and Kim Wallen, "Sex Differences in Response to Visual Sexual Stimuli: A Review", *Archives of Sexual Behavior*, 37 (2008), pp. 206-218; Erick Janssen et al., "Factors that Influence Sexual Arousal in Men: A Focus Group Study", *Archives of Sexual Behavior*, 37 (2008), pp. 252-265; Serino, Francesca Pizzoferrato and Làdavas, "Viewing a Face (Especially One's Own Face) Being Touched Enhances Tactile Perception on the Face", *Psychological Science*, 19 (2008), pp. 434-438; Markus Varjonen et al., "Genetic and Environmental Effects on Sexual Excitation and Sexual Inhibition in Men", *Journal of Sex Research*, 44 (2007), pp. 359-369; Cynthia A. Graham, Stephanie A. Sanders and Robin R. Milhausen, "The Sexual Excitation and Sexual Inhibition Inventory for Women: Psycho-Metric Properties", *Archives of Sexual Behavior*, 35 (2006), pp. 397-410; Patrick Haggard, "Just Seeing You Makes Me Feel Better: Interpersonal Enhancement of Touch", *Social Neuroscience*, 1 (2006), pp. 104-110; Stephan Hamann et al., "Men and Women Differ in Amygdala Response to Visual Sexual Stimuli", *Nature Neuroscience*, 7 (2004), pp. 411-416; Seung-Schik Yoo et al., "Neural Substrates of Tactile Imagery: A Functional MRI Study", *NeuroReport*, 14 (2003), pp. 581-585; and Jérôme Redouté et al., "Brain Processing of Visual Sexual Stimuli in Human Males", *Human Brain Mapping*, 11 (2000), pp. 162-177.

response cycle.[650] In relation to this type of visual perception, other mental states should also be considered, such as embodied simulation, imagination, identification, and empathy.

The fifth topic should investigate the relationship between the visual representation of music—through the depiction of musicians in the act of playing an instrument, for

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[650] See Ekaterina Mitricheva et al., "Neural Substrates of Sexual Arousal are not Sex Dependent", *PNAS*, 116 (2019), pp. 15671-15676; Emily G. Jacobs and Jill M. Goldstein, "The Middle-Aged Brain: Biological Sex and Sex Hormones Shape Memory Circuitry", *Current Opinion in Behavioral Sciences*, 23 (2018), pp. 84-91; Kelly M. Dumais et al., "Sex Differences in Default Mode and Dorsal Attention Network Engagement", *PLoS ONE*, 13 (2018), pp. 1-13; Dhruv Marwha, Meha Halari and Lise Eliot, "Meta-Analysis Reveals a Lack of Sexual Dimorphism in Human Amygdala Volume", *NeuroImage*, 147 (2017), pp. 282-294; Vanessa Sennwald et al., "Emotional Attention for Erotic Stimuli: Cognitive and Brain Mechanisms", *The Journal Comparative Neurology*, 524 (2016), pp. 1668-1675; Amber N. V. Ruigrok et al., "A Meta-Analysis of Sex Differences in Human Brain Structure", *Neuroscience & Biobehavioral Reviews*, 39 (2014), pp. 34-50; Gwang-Won Kim and Gwang-Woo Jeong, "A Comparative Study of Brain Activation Patterns Associated with Sexual Arousal between Males and Females Using 3.0-T Functional Magnetic Resonance Imaging", *Sexual Health*, 11 (2014), pp. 11-16; Sina Wehrum et al., "Gender Commonalities and Differences in the Neural Processing of Visual Sexual Stimuli", *The Journal of Sexual Medicine*, 10 (2013), pp. 1328-1342; Won-Suk Chung et al., "Gender Difference in Brain Activation to Audio-Visual Sexual Stimulation; Do Women and Men Experience the Same Level of Arousal in Response to the Same Video Clip?", *International Journal of Impotence Research*, 25 (2013), pp. 138-142; Serge Stoléru et al., "Functional Neuroimaging Studies of Sexual Arousal and Orgasm in Healthy Men and Women: A Review and Meta-Analysis", *Neuroscience and Biobehavioral Reviews*, 36 (2012), pp. 1481-1509; Janniko R. Georgiadis and Morten L. Kringelbach, "The Human Sexual Response Cycle: Brain Imaging Evidence Linking Sex to Other Pleasures", *Progress Neurobiology*, 98 (2012), pp. 49-81; Mira Bühler et al., "Does Erotic Stimulus Presentation Design Affect Brain Activation Patterns? Event-Related vs. Blocked fMRI Designs", *Behavioral and Brain Function*, 4 (2008), pp. 1-12; Dick F. Swaab, "Sexual Orientation and Its Basis in Brain Structure and Function", *Proceedings of the National Academy of Sciences of the United States of America*, 105 (2008), pp. 10273-10274; Meredith L. Chivers and J. Michael Bailey, "A Sex Difference in Features that Elicit Genital Response", *Biological Psychology*, 70 (2005), pp. 115-120; Chivers, "A Brief Review and Discussion of Sex Differences in the Specificity of Sexual Arousal", *Sexual and Relationship Therapy*, 20 (2005), pp. 377-390; Rudolf Stark et al., "Erotic and Disgust-Inducing Pictures-Differences in the Hemodynamic Responses of the Brain", *Biological Psychology*, 70 (2005), pp. 19-29; and Sherif Karama et al., "Areas of Brain Activation in Males and Females during Viewing of Erotic Film Excerpts", *Human Brain Mapping*, 16 (2002), pp. 1-13.

instance—and the beholder's response to it.[651] I argue that the observer of a painting representing a figure in the act of playing an instrument in front of a sheet music—as in Caravaggio's *Rest on the Flight into Egypt* (fig. 146)—is led to imagine the sound of music by the activation of brain-based mechanisms involved in the perception of

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[651] For the representation of music in painting, see Stephen A. Bergquist, "Four Centuries of String Players in Portrait Prints", *Music in Art: International Journal for Music Iconography*, 44 (2019), pp. 181-202; Stefania Macioce and Enrico De Pascale, *La musica al tempo di Caravaggio* (Rome: Gangemi, 2012); Matthias Stöckli, "Trumpets in Classic Maya Vase Painting: The Iconographic Identification of Instrumental Ensembles", *Music in Art*, 36 (2011), pp. 219-230; Antonio Baldassarre, "The Jester of Musicology, or the Place and Function of Music Iconography in Institutions of Higher Education", *Music in Art: International Journal for Music Iconography*, 35 (2010), pp. 9-35; Baldassarre, "Quo vadis Music Iconography? The Répertoire International d'Iconographie Musicale as a Case Study", *Fontes Artis Musicae*, 54 (2007), pp. 440-452; Marco Bussagli and Raffaele Simongini, *I grandi temi della pittura, 21: La musica* (Novara: De Agostini, 2006); Peter Burke, *Eyewitnessing: The Uses of Images as Historical Evidence* (London: Reaktion Books, 2001); Regula Burckhart Qureshi, "The Indian Sarangi: Sound of Affect, Site of Contest", *Yearbook for Traditional Music*, 29 (1997), pp. 1-38; Richard D. Leppert, *The Sight of Sound: Music, Representation, and the History of the Body* (Berkeley, CA: University of California Press, 1993); Elizabeth C. Teviotdale, "Music and Pictures in the Middle Ages", in *Companion to Medieval and Renaissance Music*, ed. by Tess Knighton and David Fallows (London: J. M. Dent, 1992), pp. 179-188; Tilman Seebass, "The Power of Music in Greek Vase Paintings: Reflections on the Visualization of rhythmos (Ordre) and epaoide (Enchanting Song)", *Imago Musicae*, 8 (1991), pp. 11-37; Leppert, "Music, Representation, and Social Order in Early-Modern Europe", *Cultural Critique*, 12 (1989), pp. 25-55; Andrew Green, "Musical Iconography: The History of Music through Artists' Eyes", *City University of New York Graduate School Magazine*, 3 (1984), pp. 2-8; Howard Mayer Brown, "Iconography of Music", in *The New Grove Dictionary of Music and Musicians*, ed. by Stanley Sadie, 9 vols (London: Macmillan, 1980), pp. 11-18; Leppert, *The Theme of Music in Flemish Paintings of the Seventeenth Century* (Munich: Musikverlag Katzbichler, 1977); Brown and Joan Lascelle, "What Can Works of Art Teach Us about Music?", in *Musical Iconography: A Manual for Cataloguing Musical Subjects in Western Art before 1800* (Cambridge, MA: Harvard University Press, 1972), pp. 1-12; Emanuel Winternitz, "The Iconology of Music: Potentials and Pitfalls", in *Perspectives in Musicology*, ed. by Barry S. Brook, Edward O. Downes and Sherman van Solkema (New York: W. W. Norton, 1972), pp. 80-90; Luigi Gianoli and Giorgio Mascherpa, *La pittura e la musica* (Milan: Arti grafiche Ricordi, 1967); Patricia Egan, "'Concert' Scenes in Musical Paintings of the Renaissance", *Journal of the American Musicological Society*, 14 (1961), pp. 184-195; and Lawrence Haward, *Musik in der Malerei* (Zurich: Thomas-Verlag, 1948). Very critical for my point is also Freedberg, *Choirs of Praise*.

music and sound.[652] In this sense, an important role for the creation of an auditory mental image may be played by the beholder's memory of previous experiences of listening to music and, if any, his or her actual music skills.[653]

The sixth topic should investigate further the appearance of and responses to the unfinished in the Western tradition, that is, from classical antiquity to the nineteenth century and beyond, when the unfinished becomes a constituent element of an original style by artists such as Auguste Rodin (fig. 147), Egon Schiele (figs. 148–149), or Giorgio Morandi (figs. 150–151).[654] In this sense, an extended analysis of the artistic debate on the phenomenon of the unfinished from classical antiquity to

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[652] See Karl Kandler, Amanda Clause and Jihyun Noh, "Tonotopic Reorganization of Developing Auditory Brainstem Circuits", *Nature Neuroscience*, 12 (2009), pp. 711-717; Nathalie Gosselin et al., "Amygdala Damage Impairs Emotion Recognition from Music", *Neuropsychologia*, 45 (2007), pp. 236-244; Anna Dreyer and Bertrand Delgutte, "Phase Locking of Auditory-Nerve Fibers to the Envelopes of High-Frequency Sounds: Implications for Sound Localization", *Journal of Neurophysiology*, 96 (2006), pp. 2327-2341; Elvira Brattico et al., "Musical Scale Properties are Automatically Processed in the Human Auditory Cortex", *Brain Research*, 1117 (2006), pp. 162-174; Peter Pfordresher and Caroline Palmer, "Effects of Hearing the Past, Present, or Future during Music Performance", *Perception & Psychophysics*, 68 (2006), pp. 362-376; Steven Brown, Michael J. Martinez and Lawrence M. Parsons, "Music and Language Side by Side in the Brain: A PET Study of the Generation of Melodies and Sentences", *European Journal of Neuroscience*, 23 (2006), pp. 2791-2803; Andrea R. Halpern, "Cerebral Substrates of Musical Imagery", *Annals of the New York Academy of Sciences*, 930 (2006), pp. 179-192; Robert J. Zatorre and Andrea R. Halpern, "Mental Concerts: Musical Imagery and Auditory Cortex", *Neuron*, 47 (2005), pp. 9-12; Richard Ivry and Rebecca M. C. Spencer, "The Neural Representation of Time", *Current Opinion in Neurobiology*, 14 (2004), pp. 225-232; Michael D. Mauk and Dean V. Buonomano, "The Neural Basis of Temporal Processing", *Annual Review of Neuroscience*, 27 (2004), pp. 307-340; Peter Janata and Scott T. Grafton, "Swinging in the Brain: Shared Neural Substrates for Behaviors Related to Sequencing and Music", *Nature Neuroscience*, 6 (2003), pp. 682-687; Sophie K. Scott and Ingrid S. Johnsrude, "The Neuroanatomical and Functional Organization of Speech Perception", *Trends in Neurosciences*, 26 (2003), pp. 100-107; Gregory Hickok et al., "Auditory-Motor Interaction Revealed by fMRI: Speech, Music, and Working Memory in Area Spt", *Journal of Cognitive Neuroscience*, 15 (2003), pp. 673-682; Christian Keysers et al., "Audiovisual Mirror Neurons and Action Recognition", *Experimental Brain Research*, 153 (2003), pp. 628-636; Christian Gaser and Gottfried Schlaug, "Brain Structures Differ between Musicians and Non-Musicians", *The Journal of Neuroscience*, 23 (2003), pp. 9240-9245; Hervé Platel et al., "Semantic and Episodic Memory of Music are Subserved by Distinct Neural Networks", *NeuroImage*, 20 (2003), pp. 244-256; Peter Janata et al., "The Cortical Topography of Tonal Structures Underlying Western Music", *Science*, 298 (2002), pp. 2167-2170; Evelyne Kohler et al., "Hearing Sounds, Understanding Actions: Action Representation in Mirror Neurons", *Science*, 297 (2002), pp. 846-848; Stefan Koelsch et al., "Bach Speaks: A Cortical 'Language-Network' Serves the Processing of Music", *NeuroImage*, 17 (2002), pp. 956-966; Anne J. Blood and Zatorre, "Intensely Pleasurable Responses to Music Correlate with Activity in Brain Regions Implicated in Reward and Emotion", *Proceedings of the National Academy of Sciences*, 98 (2001), pp. 11818-11823; Timo Krings et al., "Cortical Activation Patterns during Complex Motor Tasks in Piano Players and Control Subjects. A Functional Magnetic Resonance Imaging Study", *Proceedings of the National Academy of Sciences*, 278 (2000), pp. 189-193; and Zatorre et al., "Hearing in the Mind's Ear: A PET Investigation of Musical Imagery and Perception", *Journal of Cognitive Neuroscience*, 8 (1996), pp. 29-46.

[653] See Sibylle C. Herholz et al., "Neural Basis of Music Imagery and the Effect of Musical Expertise", *European Journal of Neuroscience*, 28 (2008), pp. 2352-2360.

[654] See Celeste Farge, Bénédicte Garnier and Ian Jenkins, *Rodin and the Art of Ancient Greece* (London: Thames & Hudson, 2018); Jane Kallir, *Egon Schiele: Drawings & Watercolours* (London: Thames & Hudson, 2003); Lamberto Vitali, *L'opera grafica di Giorgio Morandi* (Turin: Einaudi, 1964); and Francesco Arcangeli, *Giorgio Morandi* (Milan: Edizioni del Milione, 1964).

contemporary art, which takes into account neuroscientific research, may help to provide a more comprehensive picture of the fortune, aesthetic impact and response to unfinished artworks.

The seventh topic should assess the role of hereditary memory, collective (or cultural) memory, long-term memory, and short-term memory in aesthetic response. Starting from Aby Warburg's theory of social memory, we need to delve further into art-making and art perception and consider the recent neuroscientific research on different types of memory, its neurological roots, and its role in perception.[655] In fact, as Damasio states: "All of our memory, inherited from evolution and available at birth, or acquired through learning thereafter…exists in dispositional from (a synonym for *implicit, covert, nonconscious*), waiting to become an explicit image or action".[656]

The eighth and last topic should investigate the role of (negative) mental states such as apathy, distraction, anguish, boredom, disgust, discomfort, and embarrassment that beholders may experience when dealing with certain images in (traditional or

[655] See Tononi, *Andrea Mantegna and the Iconography of Mourners*; Aleida Assmann, *Cultural Memory and Western Civilization: Functions, Media, Archives* (Cambridge: Cambridge University Press, 2012); Jan Assmann, *Cultural Memory and Early Civilization: Writing, Remembrance, and Political Imagination* (New York: Cambridge University Press, 2011); Kandel, "The Biology of Memory: A Forty-Year Perspective", *Journal of Neuroscience*, 29 (2009), pp. 12748-12756; Kandel, *In Search of Memory: The Emergence of a New Science of Mind* (New York: W. W. Norton & Company, 2007); Assmann, "Memory, Individual and Collective", in *The Oxford Handbook of Contextual Political Analysis*, ed. by Robert E. Goodin and Charles Tilly (Oxford: OUP, 2006), pp. 210-224; Damasio, *The Feeling of What Happens*; and Gombrich, *Aby Warburg*, pp. 222-259.
[656] Damasio, *The Feeling of What Happens*, p. 332.

novel) aesthetic spaces.[657] These kinds of sensations should be assessed in relation to visits to blockbuster museums (hence, *apathy* and *distraction*) and the experience of the numerous scenes distributed by a society powered by images (hence, *boredom* and *distraction*), showing, most of the time, gruesome, violent (hence, *anguish*, *disgust*, and *discomfort*) and provocative (hence, *embarrassment*) scenes.

Investigations along these lines would lead to a more systematic theory of response to images, capable of assessing the power of images from a neuroaesthetic perspective. This should be achieved by linking the various brain-body mechanisms underpinning the responses to certain forms, or formulas, in visual works of art. In this sense, mental faculties and states such as memory, imagination, emotions, embodiment, and empathy should be positioned in relation to the aesthetic contemplation. The study of the biological processes underlying the observation of images would update, expand, and deepen the insights contained in the concept of the "power of images", as proposed by David Freedberg in 1989 and recently re-considered due to advances in neuroscientific research.[658]

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[657] For the studies on apathy, see Masud Husain and Jonathan P. Roiser, "Neuroscience of Apathy and Anhedonia: A Transdiagnostic Approach", *Nature Reviews Neuroscience*, 19 (2018), pp. 470-484. For the studies on distraction, see Sandra Paul, Norbert Kathmann and Anja Riesel, "The Costs of Distraction: The Effect of Distraction During Repeated Picture Processing on the LPP", *Biological Psychology*, 117 (2016), pp. 225-234; and Gustav Kuhn, "Misdirected by the Gap: The Relationship between Inattentional Blindness and Attentional Misdirection", *Consciousness and Cognition*, 20 (2010), pp. 432-436. For the studies on boredom, see Mihaly Csikszentmihalyi, *Beyond Boredom and Anxiety: Experiencing Flow in Work and Play* (San Francisco: Jossey-Bass, 1975). For the studies on disgust, see Paul Rozin, Jonathan Haidt and Clark R. McCauley, *Disgust*, in *Handbook of Emotions*, ed. by Lisa Feldman Barrett, Michael Lewis and Jeannette M. Haviland-Jones (New York: Guilford Press, 2016), pp. 637-653; Josh M. Cisler et al., "Attentional Bias Differences between Fear and Disgust: Implications for the Role of Disgust in Disgust-Related Anxiety Disorders", *Cognition and Emotion*, 23 (2009), pp. 675-687; and Bruno Wicker et al., "Both of Us Disgusted in *My* Insula: The Common Neural Basis of Seeing and Feeling Disgust", *Neuron*, 40 (2003), pp. 655-664. For the studies on discomfort and anguish, see Arne Öhman, "Fear and Anxiety as Emotional Phenomena: Clinical Phenomenology, Evolutionary Perspectives, and Information-Processing Mechanisms", in *Handbook of Emotions*, ed. by Michael Lewis and Jeannette M. Haviland (New York: The Guilford Press, 1993), pp. 511-536. For the studies on embarrassment, see Sören Krach et al., "Your Flaws Are My Pain: Linking Empathy To Vicarious Embarrassment", *PLoS ONE*, 13 (2011), p. e18675; Csikszentmihalyi, *Finding Flow: The Psychology of Engagement With Everyday Life* (New York: Basic Books, 1997); and June Price Tangney et al., "Are Shame, Guilt, and Embarrassment Distinct Emotions?", *Journal of Personality and Social Psychology*, 70 (1996), pp. 1256-1269. See also Charles Darwin, *The Expression of the Emotions in Man and Animals* (London: J. Murray, 1921).

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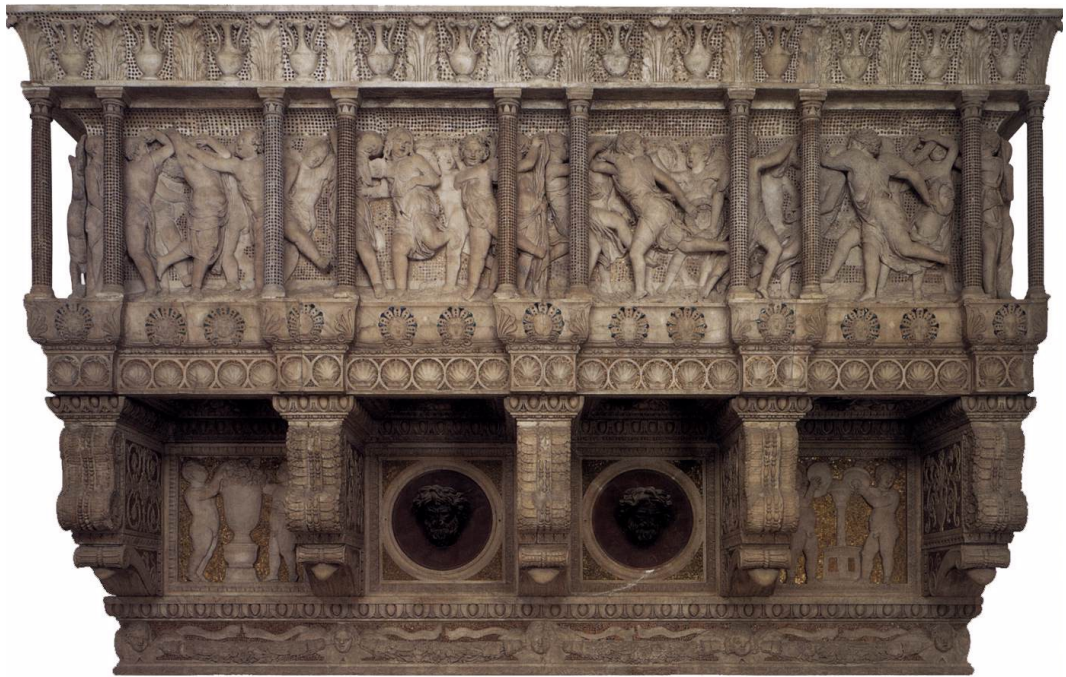
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Fig. 27. Donatello, *Singing Gallery*, detail, 1433–1438, marble (348 x 570 x 98 cm).
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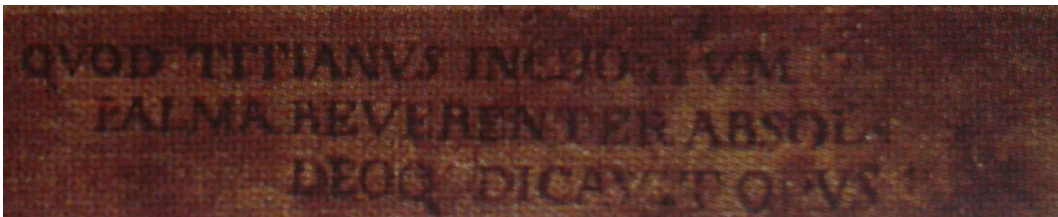
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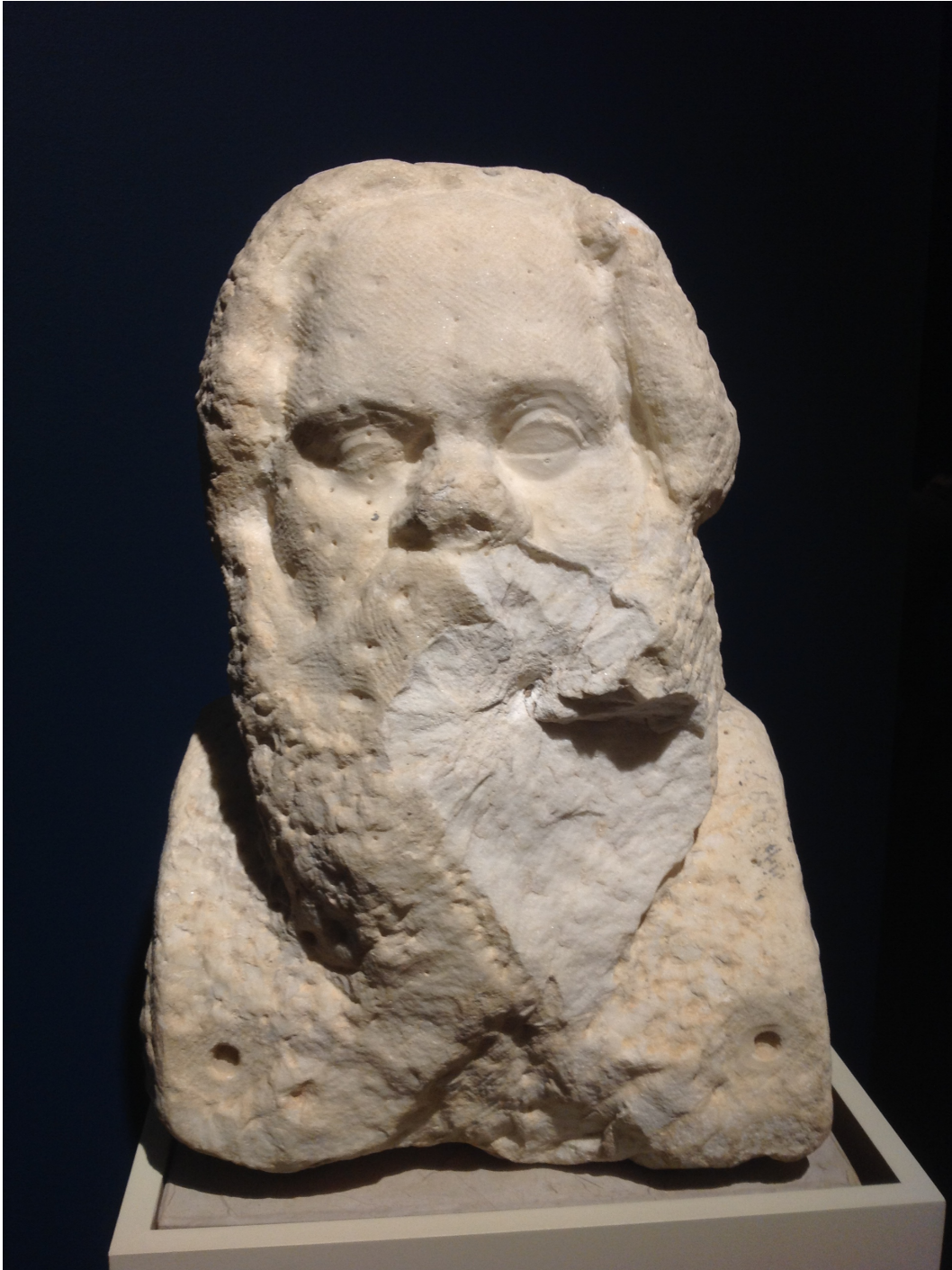
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Fig. 57. Enea Vico (attributed), *Speculum Romanae Magnificentiae: Column of Antoninus and a Roman Obelisk,* c. 1543–1570, engraving (45.5 x 32 cm). New York, Metropolitan Museum. (Image in Public Domain)

Fig. 58. Anonymous, *Dionysus and a Satyr*, early third century BC, marble. Athens, National Archaeological Museum. (© Ilya Shurygin)

Fig. 59. Anonymous, *Fragment of an Unfinished Sculpture: A Horse and Rider to Right,* c. 500 BC, limestone (20 x 16 cm). London, British Museum. (Image in Public Domain)

Fig. 60. Michelangelo Buonarroti, *Study of a Male Nude in Three-Quarter Length, Looking Down to the Right (Study for the Final Version of the Minerva Risen Christ)*, recto, c. 1520, pen and brown ink, red chalk and traces of black chalk (23.5 x 20.7 cm). Private Collection.

Fig. 61. Jacopo Caraglio (after Rosso Fiorentino), *Battle between the Romans and the Sabines*, 1527, engraving (35,6 x 50,1 cm). London, British Museum. (Image in Public Domain)

Fig. 62. Jacopo Caraglio (after Rosso Fiorentino), *Battle between the Romans and the Sabines*, incomplete state, 1527, engraving (35,6 x 50,1 cm). London, British Museum. (Image in Public Domain)

Fig. 63. Titian, *Portrait of a Lady and Her Daughter*, c. 1550, oil on canvas (88.3 x 80.6 cm). New York, Metropolitan Museum. (© Alec Cobbe)

Fig. 64. Donatello, *Lamentation over the Dead Christ*, c. 1455–1460, bronze (32.1 x 41.7 x 6.3 cm). London, Victoria and Albert Museum. (© Victoria and Albert Museum, London)

Fig. 65. Jacopo Tintoretto, *Study of a Seated Nude*, c. 1549, black and white chalk.
Paris, Louvre Museum. (© RMN-Grand Palais / Art Resource, N.)

Fig. 66. Andrea Schiavone, *The Return of the Prodigal Son who Falls at his Father's Feet*, c. 1536–1540, etching (14 x 9 cm). New York, Metropolitan Museum. (Image in Public Domain)

Fig. 67. Michelangelo Buonarroti, *The Entombment of Christ*, c. 1500–1501, tempera on panel (162 x 150 cm). London, The National Gallery. (Image in Public Domain)

Fig. 68. Anonymous, *Strigilated Sarcophagus with Portrait of a Couple; Bucolic Scene Under Clipeus, and Philosopher and Muse at Ends*, third century AD, marble. Rome, Capitoline Museum. (Image in Public Domain)

Fig. 69. Anonymous, *Strigilated Sarcophagus with Portrait of a Couple; Bucolic Scene Under Clipeus, and Philosopher and Muse at Ends*, detail, third century AD, marble. Rome, Capitoline Museum. (Image in Public Domain)

Fig. 70. Leonardo da Vinci, *Study of a Bust of a Woman*, recto, c. 1500, metalpoint and red chalk on pale red prepared paper (22,1 x 15,9 cm). Windsor, Windsor Castle, The Royal Library, Collection of Her Majesty Queen Elizabeth II. (© Her Majesty Queen Elizabeth II)

Fig. 71. Hendrick Goltzius, *Massacre of the Innocents*, c. 1585–1586, engraving (48.3 x 37.1 cm). New York, Metropolitan Museum. (Image in Public Domain)

Fig. 72. Rogier van der Weyden, *The Descent from the Cross*, c. 1435, oil on panel (220 x 262 cm). Madrid, Museo del Prado. (Image in Public Domain)

Fig. 73. Albrecht Dürer, *Melencolia I*, 1514, engraving (24 x 18.8 cm). New York, Metropolitan Museum. (Image in Public Domain)

Fig. 74. Domenico Ghirlandaio, *Birth of the Baptist*, detail, 1485–1490, fresco. Florence, Santa Maria Novella, Tornabuoni Chapel. (Image in Public Domain)

Fig. 75. Anonymous, *Dancing Maenad*, detail from a base, modified copy of a Greek original of the late fifth century BC, marble. Rome, Museo Nazionale Romano di Palazzo Massimo. (Image in Public Domain)

Fig. 76. Domenico Ghirlandaio, *Resurrection of Christ*, c. 1484, oil on panel (222 x 205 cm). Berlin, Gemäldegalerie. (Image in Public Domain)

Fig. 77. Anonymous, *Trajan's Column*, Codex Escurialensis (fol. 62). San Lorenzo de El Escorial, Biblioteca del Monasterio de San Lorenzo el Real. (Image in Public Domain)

Fig. 78. Anonymous, *Relief from Trajan's Column*, 107–113 AD, marble. Rome, Trajan's Forum. (Image in Public Domain)

Fig. 79. Domenico Ghirlandaio, *Massacre of the Innocents*, 1485–1490, fresco.
Florence, Santa Maria Novella, Tornabuoni Chapel. (Image in Public Domain)

Fig. 80. Anonymous, *Relief from the Arch of Constantine*, 315 AD, marble. Rome.
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Fig. 81. Domenico Ghirlandaio, *Apparition of the Angel to St Zechariah*, 1485–1490, fresco. Florence, Santa Maria Novella, Tornabuoni Chapel. (Image in Public Domain)

Welche Thiere gleichen einander am meisten?
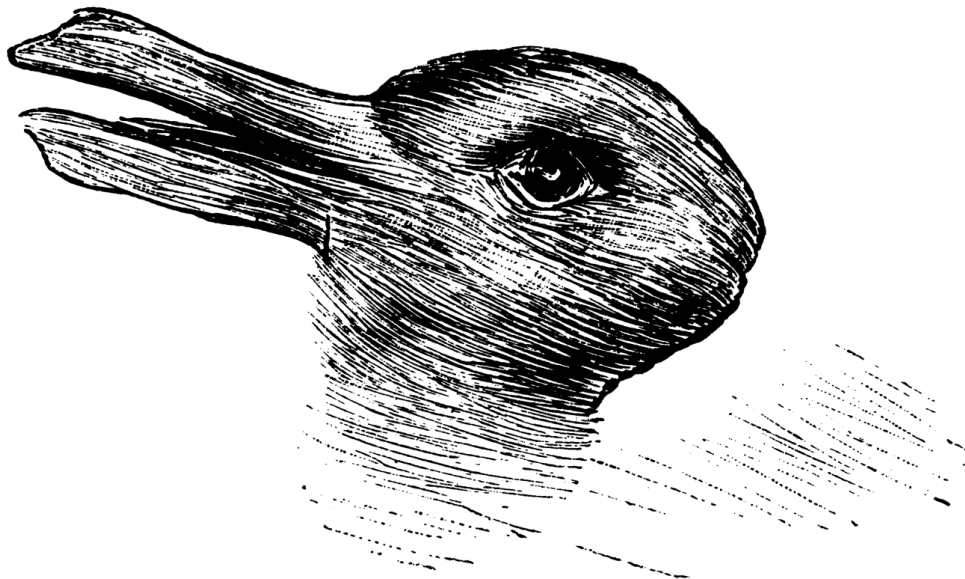
Kaninchen und Ente.

Fig. 82. Joseph Jastrow, *Rabbit–duck Illusion*, 1892. (Image in Public Domain)

Fig. 83. Diego Velázquez, *Las Meninas*, 1656, oil on canvas (318 x 276 cm). Madrid, Museo del Prado. (Image in Public Domain)

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Fig. 87. Anonymous, *Gradiva*, Roman period, marble. Vatican City, Vatican Museums, Chiaramonti Museum. (Image in Public Domain)

Fig. 88. Michelangelo Buonarroti, *Moses*, c. 1513–1515, marble (235 x 210 cm). Rome, San Pietro in Vincoli. (Image in Public Domain)

Fig. 89. Anonymous, *Medea*, Roman period, fresco. Pompeii, Casa dei Dioscuri.
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Fig. 90. Anonymous, *Gradiva*, detail, Roman period, marble. Vatican City, Vatican Museums, Chiaramonti Museum. (Image in Public Domain)

Fig. 91. Michelangelo Buonarroti, *Moses*, detail, c. 1513–1515, marble (235 x 210 cm).
Rome, San Pietro in Vincoli. (Image in Public Domain)

Fig. 92. Sigmund Freud, *Drawing of Moses*, 1914. (Image in Public Domain)

Fig. 93. Sigmund Freud, *Drawing of Moses*, 1914. (Image in Public Domain)

Fig. 94. Sigmund Freud, *Drawing of Moses*, 1914. (Image in Public Domain)

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Fig. 96. Michelangelo Buonarroti, *Moses*, detail, c. 1513–1515, marble (235 x 210 cm). Rome, San Pietro in Vincoli. (Image in Public Domain)

Fig. 97. Michelangelo Buonarroti, *Awakening Slave*, detail, c. 1525–1530, marble (h. 267 cm). Florence, Galleria dell'Accademia. (Image in Public Domain)

Fig. 98. Ugo Mulas, *Lucio Fontana*, 1964. (© Ugo Mulas Estate)
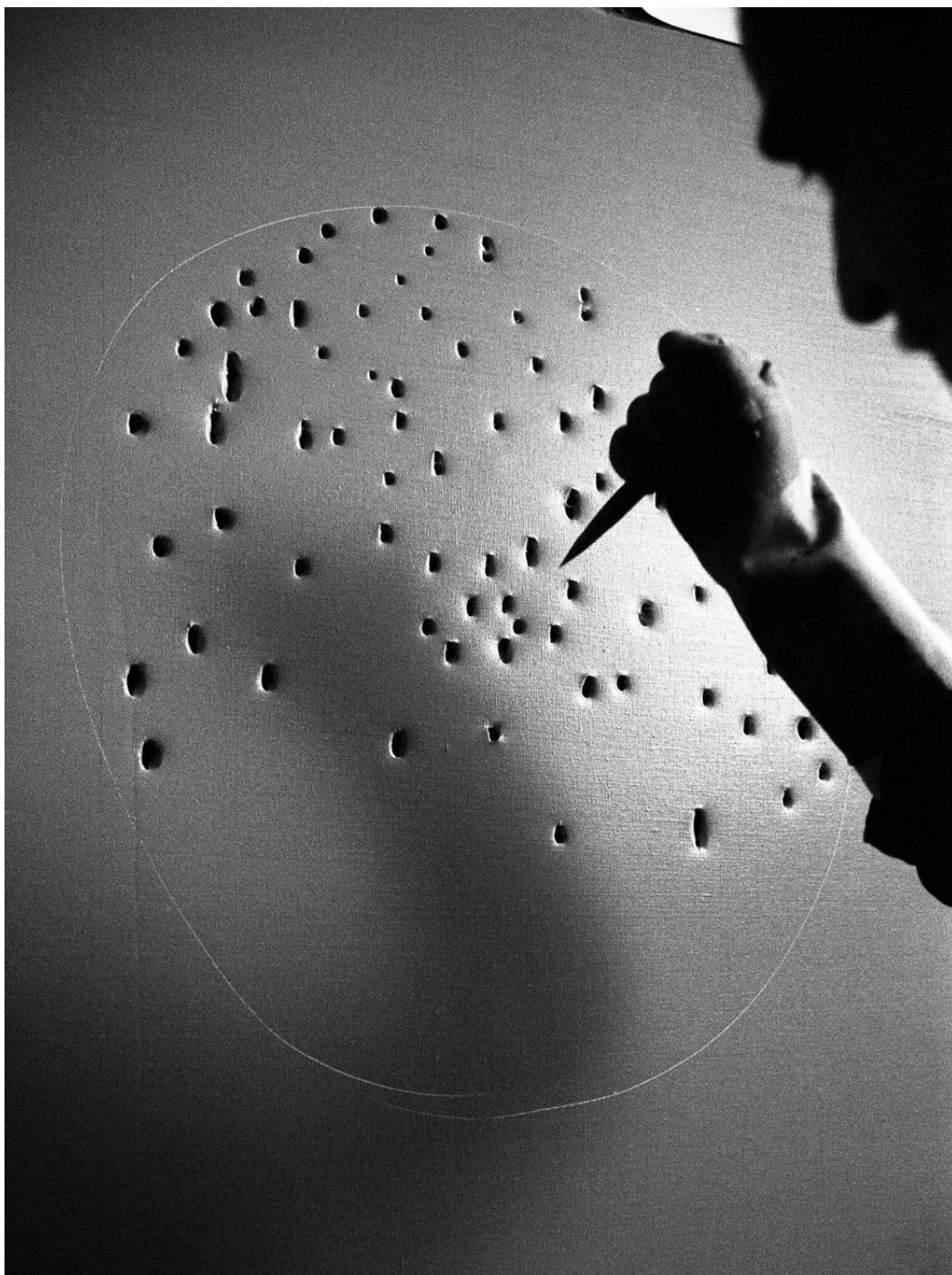
Fig. 99. Ugo Mulas, *Lucio Fontana, Il Sole, Milano (5)*, 1962–2019, modern print, gelatin silver print on baritated paper (37 x 25 cm). (© Ugo Mulas Estate)

Fig. 100. Hubert and Jan van Eyck, *Ghent Altarpiece*, detail, between 1426 and 1432, oil on panel (258 x 375 cm). Ghent, Saint Bavo Cathedral. (Image in Public Domain)

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Fig. 103. Leonardo da Vinci, *A Nude Man from the Waist Down*, c. 1504–1506, red chalk and pen and ink on pale red prepared paper (20.9 x 14.6 cm). Windsor, Windsor Castle, The Royal Library, Collection of Her Majesty Queen Elizabeth II. (© Her Majesty Queen Elizabeth II 2020)

Fig. 104. Michelangelo Buonarroti (attributed), *Male Nude Seen from the Back*, c. 1503, pen (38.7 x 19.5 cm). Vienna, Albertina. (© Albertina, Vienna)

Fig. 105. Raphael, *Study for Christ in the Disputa*, c. 1508–1510, brush and wash over leadpoint with white heightening (40.7 x 26.5 cm). Lille, Palais des Beaux Arts. (Image in Public Domain)

Fig. 106. Raphael, *Studies for Three Standing Men*, c. 1514–1515, red chalk over some blind stylus (40.3 x 28.1 cm). Vienna, Albertina. (© Albertina, Vienna)

Fig. 107. Andrea del Sarto, *Study of a Child*, c. 1528–1530, red chalk (27 x 27.2 cm).
Oxford, Ashmolean Museum. (© Ashmolean Museum, University of Oxford)

Fig. 108. Michelangelo Buonarroti, *Studies for a Head in Profile*, c. 1529–1530, red chalk (35.4 x 26.9 cm). Florence, Casa Buonarroti. (© Casa Buonarroti)

Fig. 109. Andrea del Sarto, *Five Studies for a Lunette with the Virgin and Child*, c. 1525, red chalk (28.9 x 26.1 cm). London, British Museum. (© The Trustees of the British Museum)

Fig. 110. Domenico Ghirlandaio, *Standing Figure of a Woman*,
c. 1485–1490, pen and brown ink (24.1 x 11.6 cm). London,
British Museum. (© The Trustees of the British Museum)

Fig. 111. Domenico Ghirlandaio, *Drapery Study for a Standing Figure*, 1491, brown wash on pink prepared paper, heightened with white (29 x 13.1 cm). Florence, Gallerie degli Uffizi, Gabinetto dei Disegni e delle Stampe. (© Gabinetto dei Disegni e delle Stampe delle Gallerie degli Uffizi)

Fig. 112. Domenico Ghirlandaio, *St Jerome in Penitence*, early 1480s, pen and brown ink on pink prepared paper, heightened with white (20.2 x 12.8 cm). Budapest, Museum of Fine Arts. (© Szépmüvészeti Múzeum 2019)

Fig. 113. Leonardo da Vinci, *Studies for the Christ Child*, detail, c. 1508–1510, red
chalk, brush and red wash, small traces of white gouache highlights over traces of
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Fig. 114. Leonardo da Vinci, *A Male Nude*, c. 1485–1590, metalpoint and
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Windsor Castle, The Royal Library, Collection of Her Majesty Queen Elizabeth
II. (© Her Majesty Queen Elizabeth II 2020)

Fig. 115. Leonardo da Vinci, *Study of a Naked Torso*, c. 1511, red chalk on reddish prepared paper (12 x 14.3 cm). Windsor, Windsor Castle, The Royal Library, Collection of Her Majesty Queen Elizabeth II. (© Her Majesty Queen Elizabeth II 2020)

Fig. 116. Michelangelo Buonarroti, *Study of a Male Torso with Hands Clasped and Six Studies of Hands*, c. 1510–1512, red chalk, black chalk, pen and brown ink (27.2 x 19.2 cm). Albertina, Vienna. (© Albertina, Vienna)

Fig. 117. Michelangelo Buonarroti, *Seated Male Torso (for Sebastiano del Piombo's Ubeda Pietà?); Arm and Hand Study (for the 'Last Judgement'?)*, 1532–1533, black chalk (39.9 x 28.5 cm). Florence, Casa Buonarroti. (© Casa Buonarroti)

Fig. 118. Michelangelo Buonarroti, *Study of a Seated Male Nude and of a Head for the Sistine Chapel*, c. 1537–1538, black chalk (24.2 x 18.2 cm). Haarlem, Teylers Museum. (Image in Public Domain)

Fig. 119. Michelangelo Buonarroti, *Study for a Crucifixion (for a Calvary Sculpture?)*, c. 1530, black chalk (33.1 x 22.9 cm). Haarlem, Teylers Museum. (Image in Public Domain)

Fig. 120. Michelangelo Buonarroti, *Sketches of a Male Nude and Accompanying Leg and Knee Studies (for the 'Victory')*, 1519–1520/5, black chalk over metal point (40.4 x 25.8 cm). Haarlem, Teylers Museum. (Image in Public Domain)

Fig. 121. Sebastiano del Piombo, *Study for the Burgos Madonna*, c. 1527, black chalk and white body colour (33.8 x 23.2 cm). Paris, École Nationale Supérieure des Beaux-Arts. (Image in Public Domain)

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Fig. 123. Raphael, *Study for a Group of Figures in the Sacrifice at Lystra*, detail, c. 1514–1515, metalpoint on light grey prepared paper (24.8 x 39.3 cm). Paris, Louvre Museum. (Image in Public Domain)

Fig. 124. Andrea del Sarto, *Studies of Children, and of a Left Hand*, 1522–1526, red chalk (19.8 x 24.7 cm). London, British Museum. (© The Trustees of the British Museum)

Fig. 125. Jacopo da Pontormo, *Male Torso*, c. 1532, black chalk (18.7 x 23.8 cm).
Florence, Gallerie degli Uffizi, Gabinetto dei Disegni e delle Stampe. (© Gabinetto dei
Disegni e delle Stampe delle Gallerie degli Uffizi)

Fig. 126. Jacopo da Pontormo, *Study for the Sacrifice of Isaac*, c. 1532, black chalk (28 x 19.4 cm). Florence, Gallerie degli Uffizi, Gabinetto dei Disegni e delle Stampe. (© Gabinetto dei Disegni e delle Stampe delle Gallerie degli Uffizi)

Fig. 127. Jacopo da Pontormo, *Adam Asleep*, c. 1532, black chalk (21.6 x 29 cm). Florence, Gallerie degli Uffizi, Gabinetto dei Disegni e delle Stampe. (© Gabinetto dei Disegni e delle Stampe delle Gallerie degli Uffizi)

Fig. 128. Agnolo Bronzino, *Christ in a Composition of the 'Noli me tangere' Standing and Holding a Staff*, c. 1528, red and black chalk (38.6 x 28.2 cm). Florence, Gallerie degli Uffizi, Gabinetto dei Disegni e delle Stampe. (© Gabinetto dei Disegni e delle Stampe delle Gallerie degli Uffizi)

Fig. 129. Anonymous, *Child's Sarcophagus with Unfinished Clipeus Portrait amidst Marine Creature*, first half of third century AD, marble. Vatican City, Vatican Museum. (Image in Public Domain)

Fig. 130. Anonymous, *"Dogmatic" Sarcophagus*, c. 325–350 AD, marble. Vatican City, Vatican Museum. (© Governorate of Vatican City State – Directorate of the Museums and Cultural Heritage)

Fig. 131. Anonymous, *Sarcophagus with Lid and Four Unjoined Fragments*, made in an Attic workshop, 180–220 AD, marble (134 x 211 x 147 cm). Los Angeles, The J. Paul Getty Museum. (Image in Public Domain)

Fig. 132. Anonymous, *Marble Sarcophagus Lid with Reclining Couple*, c. 220 AD, marble (l. 231.1 cm). New York, Metropolitan Museum. (Image in Public Domain)
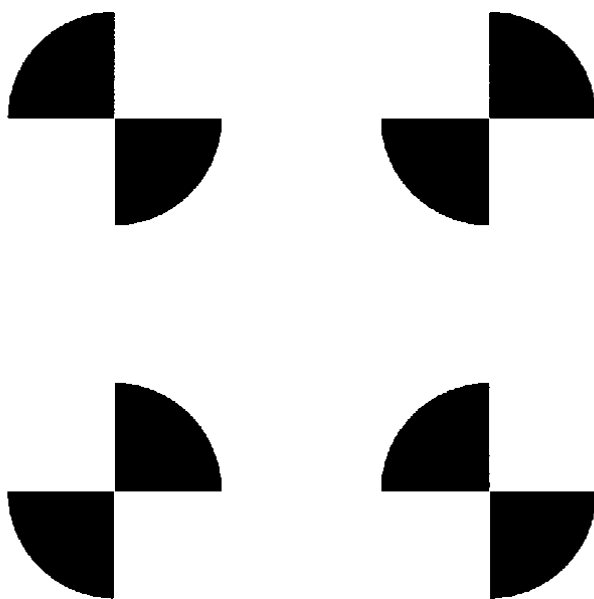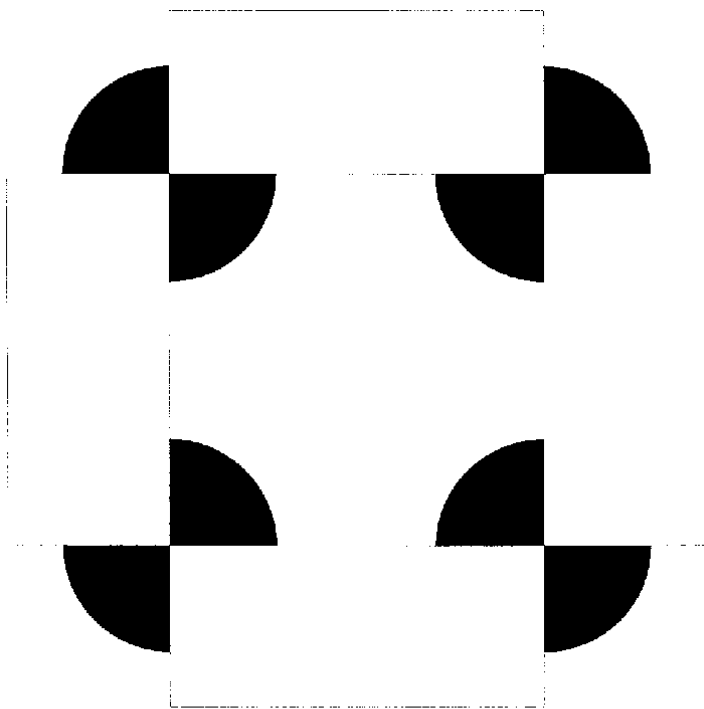
Fig. 133. Luiz Pessoa, Evan Thompson and Alva Noë, *Four Disks Occluded by Four Rectangles* (top); *Four Disks Occluded by Four Illusory Rectangles* (bottom), 1998. In Luiz Pessoa, Evan Thompson and Alva Noë, "Finding out about Filling-in: A Guide to Perceptual Completion for Visual Science and the Philosophy of Perception", *Behavioral and Brain Sciences*, 21 (1998), pp. 723-802 (729).
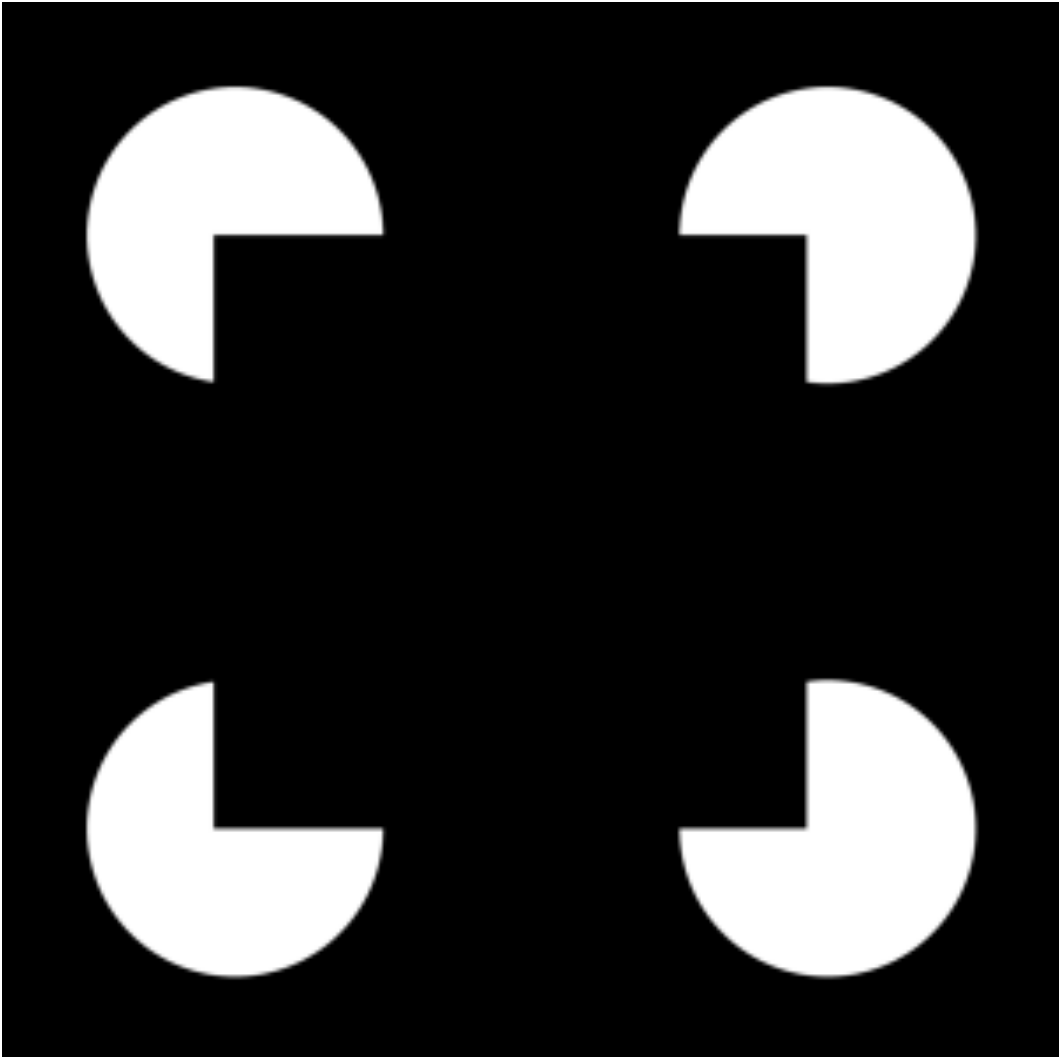
Fig. 134. Gaetano Kanizsa, *Square*. (Image in Public Domain)

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Fig. 138. Edgar Degas, *Spanish Dancer (Second State)*, modeled probably c. 1884, cast 1920, bronze (43.2 x 21.3 x 15.2 cm). New York, Metropolitan Museum. (Image in Public Domain)

Fig. 139. Pedieus Painter, *Erotic Scene: Rim of an Attic Red-figure Kylix*, c. 510 BC, red-figure pottery (8.5 x 25 cm). Paris, Louvre Museum. (Image in Public Domain)

Fig. 140. Anonymous, *Erotic scene*, first century BC, fresco. Pompeii, Bedroom (Cubiculum 43) in the House of the Centurion. (Image in Public Domain)

Fig. 141. Anonymous, from the *Gardens of Pleasure*, Kangxi period (1662–1722), ink and colour on silk (39.5 x 55.5 cm). Netherlands, The Bertholet Collection. (© Ferry Bertholet)

Fig. 142. Katsushika Hokusai, *Man Biting a Breast*, 1815–1823, print (25.7 x 39 cm).
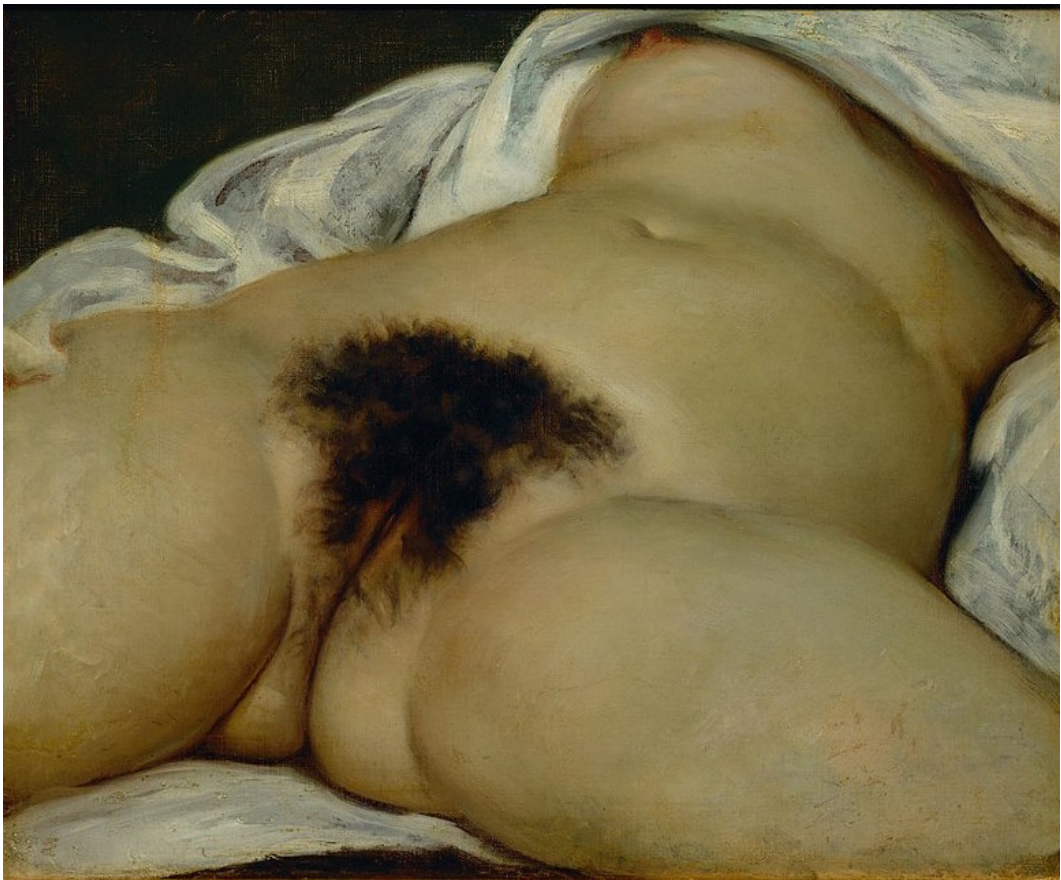Amsterdam, Rijksmuseum. (Image in Public Domain)

Fig. 143. Gustave Courbet, *The Origin of the World*, 1866, oil on canvas (46 x 55 cm). Paris, Musée d'Orsay. (Image in Public Domain)

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Fig. 145. Jeff Koons, *Ilona On Top (Rosa)*, 1991, plastic (119.4 x 269.2 x 177.8 cm). (© Jeff Koons)

Fig. 146. Caravaggio, *Rest on the Flight into Egypt*, c. 1597, oil on canvas (135.5 x 166.5 cm). Rome, Doria Pamphilj Gallery. (Image in Public Domain)

Fig. 147. Auguste Rodin, *Thought*, c. 1895, marble head and rough hewn base (74.2 x 43.5 x 46.1 cm). Paris, Musée d'Orsay. (Image in Public Domain)

Fig. 148. Egon Schiele, *Eva Steiner*, 1918, black chalk (49.9 x 32.5 cm). Vienna, Albertina. (© Albertina, Vienna)

Fig. 149. Egon Schiele, *Female Torso in Underwear and Black Stockings*, 1917, gouache, watercolor and black Conté crayon (46 x 29.8 cm). Private Collection. (Image in Public Domain)

Fig. 150. Giorgio Morandi, *Still Life*, 1963, pencil (16.8 x 24.2 cm). (Image in Public Domain)

Fig. 151. Giorgio Morandi, *Still Life*, 1960, watercolor and pencil (21.5 x 24.6 cm). Private Collection. (Image in Public Domain)