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Embodying the Face: The Intersubjectivity of Portraits and Self-portraits

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Abstract
The topic of the human face is addressed from a biocultural perspective, focusing on the empirical investigation of how the face is represented, perceived, and evaluated in artistic portraits and self-portraits from the XVth to the XVIIth century. To do so, the crucial role played by the human face in social cognition is introduced, starting from development, showing that neonatal facial imitation and face-to-face dyadic interactions provide the grounding elements for the construction of intersubjective bonds. The neuroscience of face perception is concisely presented and discussed, together with the psychophysics of face perception and gaze exploration, introducing the notions of the left visual field advantage (LVFA) and the left gaze bias (LGB). The results of experiments on the perception and the emotional and aesthetic rating of artistic portraits and self-portraits are reported, showing that despite participants' inability to tell self-portraits and portraits apart, greater emotional, communicative-social, and aesthetic ratings were attributed to self-portraits. It is concluded that neuroscience and experimental aesthetics can contribute to better understand the human face, hence to better understand ourselves.

Keywords Aesthetics · Embodiment · Face · Neuroscience · Portraits · Self-portraits

1 Introduction

> I have never consciously registered just how many faces there are. There are a great many people, but there are a great many more faces, for every person has several. Rilke, 2016, [5], 48.

The present paper addresses the human face from a biocultural perspective, showing that neuroscience and empirical aesthetics, by studying the reception and the neurobehavioral correlates of the perception of artistic portraits and self-portraits, can shed light on the way we perceive real human faces and on the biological roots of the aesthetics of the human face as represented in art works.

For us humans, the face is not just a part of the body. In the face are concentrated, in fact, the main means of communication that we have: speech and emotional expression. One of the striking features of the somatotopy of cortical sensorimotor organization in primates' brain is the exception that face and hand constitute with respect to the remaining body parts. Tactile sensitivity and movement control are mapped contiguously from the big toe to the upper limb, both in the somatosensory map of the SI area and in the motor map of the primary motor area. Hand and face, however, while not anatomically contiguous, are mapped by contiguous neuronal groups in both areas. It is possible to hypothesize that this contiguity has to do with the relational nature of these two distal body parts: face and hand are the main tools with which we relate to the world and communicate with others. As shown by developmental research, the face is the first mean used to build interpersonal relations. Much of what we understand and learn about others is conveyed by their facial expressions: by looking at people's faces we can assess not only their emotions but also trustworthiness, attractiveness, and age. As emphasized by Emmanuel Levinas, the face of the other also crystallizes an ethical commitment, because "In the face of the other man I am inescapably responsible and consequently the unique and chosen one." (1989, p. 84).

What is a human face? Shortly, the human face plays a major role in interpersonal relations. In the last decades, neuroscience has shown even at the innermost level of

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description -that of neural assemblies and brain circuits—the quintessential relational nature of human beings as situated, feeling, and acting bodily selves (Gallese 2014). Indeed, the multi-layered nature of the self rests upon a basic or core level, described as bodily self. The sense of bodily self is built not only upon the neural mapping of specific parts of the body (Ionta et al. 2011), but also of facial body parts (Platek et al. 2008; Devue and Brédart 2011). The face is crucial for our sense of identity. A coherent representation of one's own face is formed and continuously updated, based on the congruent multisensory signals that are constantly experienced and integrated (see Schneider and Carbon 2021). The relevant role of multisensory integration underlying the plasticity of the bodily self and of the way we experience it has been extensively demonstrated by bodily illusions that can temporarily change our body experience, as revealed by the Rubber Hand Illusion (Botvinick and Cohen 1998; Lenggenhager et al. 2007). The same occurs with our face representation, as revealed by the Enfacement Illusion (Tsakiris 2008; Sforza et al. 2010).

In the Enfacement Illusion (EI) (Sforza et al. 2010), participants are synchronously touched on the same part of the face as another person standing in front of them and have the impression of seeing themselves in the mirror and feeling on their own face the tactile stimuli observed on the other person's face. These experiences are accompanied by a misattribution of the others' facial features to the self-face in self-other discrimination and recognition tasks (Tsakiris 2008; Sforza et al. 2010). Thus, not differently from other body parts, our face experience is porous and malleable.

Due to its centrality for social relations and self-identity, for social recognition and cooperation, the human face has been the target of an impressive amount of empirical research in a variety of scientific disciplines, like developmental psychology, social psychology, and neuroscience. Not surprisingly, the human face has also been an important topic of visual art, with the progressive development of portraits and self-portraits, and the object of theoretical speculations in the humanities.

Here we want to focus on the empirical investigation of how the face is perceived and evaluated in artistic portraits and self-portraits from the XVth to the XVIIth century, presenting the results of experiments from our lab. What is proposed enables to shed new light on basic issues related to face perception and, at the same time, it contributes to the theoretical debate on the aesthetics of the human face.

To do so, the crucial role played by the human face in social cognition is introduced, starting from development, showing that neonatal facial imitation and face-to-face dyadic interactions provide the grounding elements for the construction of intersubjective bonds. The neuroscience of face perception is concisely presented and discussed, together with the psychophysics evidence on face perception and its gaze exploration, introducing the notions of the left visual field advantage and the left gaze bias. Finally, experiments on artistic portraits and self-portraits and their results (Siri 2020; Siri et al. 2020) are presented and discussed. It is concluded that neuroscience and experimental aesthetics can contribute to better understand the human face, and to better understand ourselves.

2 The Face in Human Development

From the first moments of our life, the face represents a visual stimulus towards which we preferentially orient ourselves. According to Francesca Simion, author of many pioneering studies on neonatal preference for faces (Valenza et al. 1996; Simion et al. 2001), "*several studies have shown that newborns prefer looking at face configurations, rather than at other, equally complex, non-face stimuli. Most authors would agree that this phenomenon is highly adaptive because, by ensuring that infants have visual experience with faces, this initial predisposition would favor the gradual emergence of the specialized cortical circuits that subserve face processing in adults."* (Simion et al. 2006).

Neonates' predisposition to orient towards faces plays a decisive role in developing a bond with the parents. As argued by Ammaniti and Gallese (2014), at two months, infants can recognize their mother's face among others. Mothers are attracted to the baby's face, which affectively stimulates them to focus their child, to respond to and to care for him/her. These babyish features serve as an infant schema which activates attention, affective bond and nurturing in adult humans who take care of them.

Face-to-face interactions between parents and infants emerge quite early and are bidirectional. High-intensity mirroring exchanges create a merger experience, which acts as a bedrock for the forging of the affective ties of the attachment bond. The visual experience of the face plays a critical role in social and emotional development: in particular, the mother's emotionally expressive face is the most potent visual stimulus in the infant's experience. As famously put by Donald Winnicott (1971, p. 151), "*What does the baby see when he or she looks at the mother's face? I am suggesting that, ordinarily, what the baby sees is himself or herself. In other words, the mother is looking at the baby and what she looks like is related to what she sees there.*"

The face is indeed the first mean for neonates to connect to others through neonatal facial imitation. Since the seminal study of Meltzoff and Moore (1977) we know that the innate presence of imitative abilities in human infants is a well-known transitory phenomenon, extensively investigated and confirmed by different studies. Human newborns can reproduce facial gestures (Legerstee 1991; Meltzoff and Moore 1998) and facial expressions (Field et al. 1982). Five to eight

weeks-old infants imitate the tongue protrusion behavior of a human model only, and not the one of non-biological agents (Legerstee 1991). This shows that neonatal imitation of facial behavior is selective for conspecifics. Neonates are innately prepared to link to their caregivers through imitation of their facial movements. Similar evidence on neonatal imitation has been obtained from non-human primates (Paukner et al. 2011; Ferrari et al. 2012), possibly related to an innate rudimentary form of mirror mechanism[1] (see Gallese et al. 2009).

3 Perceiving the Face: Models and Neuroscientific Evidence

Face perception is probably one of the most developed human perceptual abilities and plays a very important role in social interactions (Haxby et al. 2002). Bruce and Young (1986) proposed a model of facial information processing composed of two separate and independent functional processes: one for the recognition of facial movements and facial expressions, and one for the recognition of facial identity. The recognition of facial movements and expressions is based on variable aspects of the face such as eye movements, mouth movements, and gaze direction (Haxby et al. 2000). The recognition of facial identity, on the other hand, is based on the perception of certain aspects of the face that are independent of changes in facial expressions like semantic information, names of familiar people, etc. (Breen et al. 2000; Ellis and Lewis 2001). This view is most likely oversimplistic, as face processing in the brain encompasses the activations of multiple networks. Indeed, results show that facial attractiveness is addressed by a very different process than facial distinctiveness (see Carbon et al. 2010).

According to Haxby and Gobbini (Gobbini and Haxby 2007; Haxby and Gobbini 2011; Haxby et al. 2000, 2002), face processing would be underpinned by a distributed neural system, consisting of the visual system, the so-called limbic system,[2] and frontal areas. This distributed cortical network would be reportedly divided into a *Core System* and an *Extended System*, in mutual connection.

The Core System is responsible for the visual analysis of faces, both from the point of view of invariant features, such as identity, and of changing visual aspects, such as eye movements. The Extended System deals with dynamic features and information conveyed by faces, such as emotional expressions. Not surprisingly, most research on the neural correlates of face perception focused on the role of visual areas. Functional magnetic resonance imaging (fMRI) studies have shown that specific areas for face processing are in the occipito-temporal extrastriate visual cortex (Haxby and Gobbini 2011): the Occipital Face Area (OFA) in the inferior occipital gyrus, the Fusiform Face Area (FFA) in the lateral fusiform gyrus, and the Superior Temporal Sulcus (STS) (Hasson et al. 2004). According to Haxby et al. (2002), these extrastriate occipito-temporal areas constitute the Core System and play a key role in the representation of both structural invariant and dynamic facial features. The FFA is involved in the representation of static facial features and play a dominant role in the encoding of facial identity (Calder and Young 2005). This region responds to both individual parts and the global configuration of the face (Rotshtein et al. 2005). The activation of the superior temporal sulcus would be associated with the representation of dynamic facial features such as lip movements related to speech, movements related to the display of facial expressions, and eye movements, with associated gaze direction. More specifically, visual processing of facial expressions occurs within the posterior part of the superior temporal sulcus (pSTS, Harris et al. 2012; Pitcher 2014; Srinivasan et al. 2016; Paracampo et al. 2018).

Empirical evidence shows that the recognition of facial expression also involves the activation of areas of the Extended System. One of the functional characteristics of the Extended System is to quickly distinguish familiar faces from unfamiliar ones. The key elements in the neural mapping of familiar individuals are the retrieval of knowledge one has about a person (e.g., biographical information, past experiences, attitudes associated with a person) and the emotional response that the person elicits. These areas include those that display the mirror mechanism (see Gallese 2014): the premotor cortex (PMC), the inferior parietal lobe (IPL), and the frontal operculum (FO). It has been proposed that these areas allow a motor simulation of facial expressions, thus enabling the recognition of others' facial expressive movements (Gallese 2014; Mastrella and Sessa 2017; Paracampo et al. 2016).

The perception of facial expressions as mediated by the Extended System also involves areas associated with emotion processing such as the amygdala and insula (Atkinson and Adolphs 2011). It has been proposed that this neural substrate allows one to understand the emotional quality of the others' facial expressions by means of embodied simulation,[3] that is, mapping others' facial expressions by

[1] This mechanism is displayed by neurons—mirror neurons—originally discovered in macaques' premotor cortex. Mirror neurons discharge both when goal-related acts are performed and when observed being executed by others. A similar mechanism was later described also in the human brain (see Gallese 2014, 2016).

[2] The notion of limbic system appears outdated and unsupported by empirical evidence. For a critical discussion, see Pessoa et al. (2021).

[3] Embodied simulation (ES) has been proposed as a basic functional mechanism of the brain, relevant for social cognition. It is not limited exclusively to action, but it extends to other aspects of intersubjectivity, like sensations and emotions. According to the ES hypothesis, the

reusing beholders' brain regions active during the subjective experience of the same expressions (Gallese 2014). Finally, the Extended System also includes regions involved in the retrieval of personal knowledge, such as the anterior temporal cortex, the precuneus (PC), posterior cingulate cortex (PCC) and the medial prefrontal cortex (MPFC). In sum, the Extended System is composed of several brain regions, involved in emotional, attentional, semantic, and linguistic processing, which support the analysis of different facial features.

Haxby and Gobbini's model has been favorably received by the scientific community, however, according to some criticisms (e.g., Calder and Young 2005), a total anatomical-functional dissociation between identity recognition and expression recognition is overly restrictive.

4 The Asymmetric Production and Perception of Facial Expressiveness: Empirical Evidence

After having dealt with the neural underpinnings of face processing, let us now turn to what is distinctive about the production and perception of facial expressiveness by reviewing a series of psychophysical experiments. Studies on the perception of the expressiveness of real faces tend to focus on the so-called cheek bias (i.e., a preference to display one's hemi-face). Studies on the perception of the emotional expressiveness of real-life faces, however, have also examined other left–right asymmetries and biases, such as the greater expressiveness of the left anatomical hemi-face, the left visual field advantage (LVF) and the left gaze bias (LGB).

The phenomenon of phylogenic facial asymmetries and brain laterality in the production of emotional facial expressions has been widely discussed since Charles Darwin's book "*The Expression of the Emotions in Man and Animals*" published in 1872. Traditionally, studies have documented a strong motor component in the cortical innervation of the upper part (symmetrically and bilaterally innervated) and lower two-thirds of the face (asymmetrically innervated, i.e., the left inferior portion of the face is predominantly innervated by the right cerebral hemisphere), both in human and nonhuman primates (Borod et al. 1998; Lindell 2013a; Morecraft et al. 2004; Müri 2016; Salva et al. 2012). Therefore, the study of facial musculature and facial expression may support hemispheric lateralization of emotion since the right hemisphere controls the lower two-thirds of the left face. Indeed, behavioral and physiological studies have examined the asymmetrical involvement of the left and right side of the face during the production of deliberate, as well as spontaneous, emotional expressions and mimicry in human participants: these studies showed the greater involvement of the left hemi-facial muscles (voluntary expressions, see Nicholls et al. 2004; Triggs et al. 2005; Zhou and Hu 2006; spontaneous expressions, see Holowka and Petitto 2002; spontaneous mimicry: Dimberg and Petterson 2000; voluntary and spontaneous expressions, see Indersmitten and Gur 2003). Thus, the greater involvement of the muscles of the left half of the face may produce more intense facial emotional expressions on that side.

The anatomically asymmetric involvement in emotional facial expression may have an impact also on the perception of the expressiveness of frontally presented faces, and on the preference of displaying one's left cheek and its perception. According to the theory of right hemisphere dominance, the right hemisphere has a dominant role both in emotional production and in emotion perception (for a review see Demaree et al. 2005).

Studies with composite faces presenting the same anatomical hemi-faces (i.e., left-left; right-right) have shown that anatomical left-left composites of faces are rated by beholders as more emotionally expressive (Indersmitten and Gur 2003; Nagy 2012). More recently, studies of portraits, photos and selfies demonstrate that the subjects represented in the images tend to display the more expressive left hemi-face (for portraits, see Humphrey and McManus 1973; McManus and Humphrey 1973; Grusser et al. 1988; Lindell 2013a,b; Powell and Schirillo 2011; White 2019; for photos, see Nicholls et al. 1999, 2002; Nicholls and Roberts 2002; for selfies, see Bruno and Bertamini 2013; Bruno et al. 2015, 2016; Lindell 2015, 2017; Manovich et al. 2017) and that beholders tend to rate the left cheek biased faces as more emotionally expressive (Low and Lindell 2016; Galea and Lindell 2016; Nicholls et al. 2004).

Footnote 3 (continued)

ability to understand the behavior of others and the underlying intentions, to imitate others' behavior, to understand directly and experientially the sense of the emotions and sensations that others express, depend on the constitution of a we-centric space, formed as a 'shared manifold'. This system can be defined operationally at three different levels: phenomenological, functional, and sub-personal. The phenomenological level can be defined as the empathic experience that we normally harbor vis-à-vis other people. The actions performed by others, and the sensations and emotions they experience take on meaning for us due to the possibility of sharing them experientially through a common neural format. The functional level is represented by routines of embodied simulation, 'as-if' integration modalities that permit us to create models for ourselves and for others. The mechanisms at the basis of our actions and experiences are reused for the implicit comprehension of the actions and experiences of others. Finally, the sub-personal level is constituted of the activity of a series of neural circuits mapping others' actions, sensations and emotions on self-related brain circuits. ES coincides with the more corporeal aspects of empathy, but with a wider range of application that extends to imagination, our relations with objects and the space around our body (see Gallese 2001, 2003, 2007, 2014).

Furthermore, the potentially prominent activation of the right hemisphere during the emotional processing of faces may result in an attentional left side bias. Indeed, two behavioral phenomena that may be associated with the right hemispheric dominance of spatial attention control and emotional processing are: the left visual field advantage (LVF) and left gaze bias (LGB), both during the observation of faces and facial expressivity.

The LVF advantage refers to beholders' bias for stimuli, especially faces, that occur entirely or partially in the left half of the beholders' visual field, resulting in higher ratings and task performance for left-presented stimuli (Brederoo et al. 2019; for a meta-analysis, see Voyer et al. 2012). A possible explanation for this advantage may be that the information processed in the left visual field is projected to the right contralateral hemisphere, reportedly dominant for emotions.

The LGB, on the other hand, is the tendency to direct the first fixation and saccade, as well as spend more looking time, on the part of the centrally presented face appearing in the left visual field (anatomical right hemi-face). Some studies show a LGB for the visual scan path of neutral faces (Leonards and Scott-Samuel 2005; Guo et al. 2009) as well as of emotionally expressive faces (Guo et al. 2012; Racca et al. 2012; Butler et al. 2005; Thomas et al. 2014; Wu et al. 2012; Vervoort et al. 2013).

It is seemingly contradictory that there is greater expressiveness in the left anatomical part of the face, whereas preference and early attentional engagement is for the anatomical right half of the face of someone facing us (i.e., the half of the face which is presented in the participants' left visual field). As a result, the anatomical left hemi-face bias and the LVF/LGB biases have traditionally been studied in isolated manner from each other. Both the anatomical left hemi-face bias and the LVF bias have been demonstrated, but it is plausible that their impact on the viewer's emotional processing might differ.

The potential difference in the perceptual experience of the expressiveness of self-portraits and portraits painted before the development of photography, may be dependent upon the abovementioned contradiction, hence its study might shed light on the LVF/LGB unresolved issues. Indeed, the production of self-portraits flourished around the fifteenth century, most likely because of both socio-cultural changes and technical innovations in the production of mirrors (e.g., Hall 2014; Melchoir-Bonnet 2014). Self-portraits can be painted in part, or entirely, from memory or imagination; however, artists still only have access to their own image through the act of seeing themselves in the mirror. As a result of the use of mirrors, the anatomical left side of the artist's face appears in his/her left visual field. This means that the most expressive part of the face, once transferred on canvas, appears in the biased left hemi-field, which tends to attract beholders' attention earlier and longer, and is preferred in perceptual tasks. Portraitists, in contrast, would paint a model positioned directly in front of them, hence the anatomical left side of the portrayed face appears in the artist's right visual field. Thus, in the case of portraits the more expressive part of the face does not appear in the visual hemi-field for which there is an attentive and/or perceptual bias.

Artistic portraits and self-portraits have been used to study the left-cheek bias; however, given their peculiar characteristics, they are also interesting experimental stimuli for the joint study of multiple attentional-perceptual biases. In the next section, the empirical investigation of the perception of portraits and self-portraits is presented.

5 The Reception of Portraits and Self-portraits: Empirical Studies

> The face is usually viewed as the primary site of human communicativeness, housing both eyes, often deemed windows of the soul, and the mouth, that conduit of humans' explicit proclamations of will and feelings. Equally often those windows are termed 'mirrors'. Since it is often the individual's primary mode of access to the sight of a portion of the body widely identified as a transmitter of the essence of selfhood, the mirror bears a privileged relationship with the face (Paul Coates, 2012, 3)

Can people explicitly recognize the difference between portraits and self-portraits? Can they tell them apart? Are self-portraits more expressive than portraits? And, if so, is it possible to hypothesize a connection between the emotional salience of the represented face and the theories regarding hemispheric lateralization of emotion processing? Can the empirical answers to these questions bear any import to issues related to the aesthetics of portraits and self-portraits and their reception?

To answer these questions, a series of experiments were carried out (Siri 2020; Siri et al. 2020). When beholding a portrait, three constituents can be distinguished: the artist, the person portrayed and the beholder. On the other hand, the ternary relationality of the self-portrait has a fundamental difference: the subject of the painting is the artist, a "double" of himself. As a result, and according to our hypothesis, it may be that the beholder's experience of the self-portrait is contingent on a more direct and augmented "intersubjectivity". Self-portraits may be perceived as more emotionally salient than regular portraits of sitters that do not share a close relationship with the painter. Indeed, the self-portraitist presents his person both to himself and to us, so that "*the artist and the sitter [merge] into one, they*

have the allure of a private diary, in that they seem to give us an artist's insight into his or her own personality." (West 2004, p. 163).

It should be noted that in the case of self-portraits, the artist transfers on the canvas an image that is the elaboration of the mirror's reflection of the artist's face, which is not static, but most likely dynamically changes as the artist 'tries' different expressions while gazing in the mirror. It is only in the self-portrait that the expressive movements of the portrayed face and the movements of the hand drawing them all belong to the same body. According to the first 'motor expression hypothesis', this unique condition might provide the artist with greater power of introspection, in turn translated into the painting gestures, eventually to be appreciated by the beholders, leading them to feel more emotionally engaged by self-portraits than when looking at portraits.

According to the second not mutually exclusive 'perceptual congruence hypothesis', since from the fifteenth century until the invention of photography self-portraits have been painted using mirrors, the left side of the artist's face was painted on the left side of the canvas, contrary to portraits, in which the left side of the sitter's face was painted on the right side of the canvas (e.g., Calabrese 2010; Hall 2014; Latto 1996; Bruno and Bertamini 2013; Lindell 2013a, b). Hence, self-portraits before the nineteenth century display the more expressive part of the face on the biased, left half of the visual field of the observer. This difference has never been investigated, and at times even ignored. Thus, the perceptual congruence between the most expressive left half of the face and the beholder's left half of the visual field, which is dealt with by the right cerebral hemisphere, could lead to beholders' stronger emotional and social engagement with self-portraits than with portraits.

These issues were addressed by hypothesizing that portraits and self-portraits might be experienced and visually explored differently, even if not explicitly recognized as such. More specifically, it was investigated whether participants could explicitly differentiate between portraits and self-portraits and hypothesized that they would rate self-portrait expressions as more emotionally intense with respect to portraits, and that their attention would be engaged earlier by self-portraits than portraits. Thus, first fixation latency would be shorter, and first fixation duration would be longer for the left cheek of self-portraits than that of portraits, because of the perceptual congruence between the self-portrait's left face and the beholder's left visual field. To achieve this, twelve half-bust self-portraits, twelve half-bust portraits and their rotated by 180° counterparts were presented as experimental stimuli to thirty-one participants during an eye-tracking and a behavioral task (Siri 2020; Siri et al. 2020). The rotation by 180° of all stimuli was introduced to possibly tell the two hypotheses apart, as in inverted self-portraits the perceptual congruence between the artist's left face and the beholder's left visual field would no longer exist, while it would be present in inverted portraits.

Despite participants' inability to tell self-portraits and portraits apart, the behavioral results showed greater emotional and communicative-social ratings for the self-portraits than in the case of the portraits, regardless of the format of their presentation (i.e., in the canonical orientation or rotated by 180°). Furthermore, self-portraits were rated as more pleasing and aesthetically beautiful than portraits, again regardless of the format of their presentation. This suggests that self-portraits, in agreement with the first 'motor expression hypothesis', were perceived with more emotionally intense expression than portraits, but -in contrast with the second 'perceptual congruence hypothesis'- regardless of the congruency between the left face and the beholder's left visual field. Indeed, higher ratings for self-portraits were present also when they were shown rotated by 180°. Considering the explicit task related to the emotional intensity of the depicted subject, the current results lend further support to the notion that emotional expressiveness of the anatomic left cheek in self-portraits is a potentially decisive factor, regardless of its congruence with the left hemispace.

The eye-tracking results, confirming the initial hypothesis on the perceived higher emotional expressiveness of self-portraits than portraits, showed different visual scan paths for the two types of stimuli. Shorter latency and longer duration of the first fixation -a marker of attentional salience- were recorded for self-portraits with respect to portraits. This result is consistent with previous eye-tracking studies in which greater attentional salience emerged for more emotional stimuli (Vervoort et al., 2013; LaBar et al. 2000; Kissler and Keil 2008; Calvo and Lang 2004; Nummenmaa et al. 2006). The same results were obtained for inverted self-portraits. Once again, the congruence of the left face and beholders' left visual field was not relevant for the experience of self-portraits. However, this was the case with portraits, where the first fixation was longer for the anatomical left of the inverted portraits than for the anatomical right of the inverted self-portraits. Thus, the congruence of beholders' left visual hemi-field and the left hemi-face seems to play a role in the perception of the emotional expressiveness of the portraits only.

Overall, these results show that self-portraits and portraits are experienced differently even though beholders are not able to explicitly tell them apart. Indeed, self-portraits are experienced as more intense in terms of emotional expression and evoked emotional experience, and more socially engaging than portraits, independently from their canonical or inverted orientation. Furthermore, the congruency between the anatomic left cheek and the beholders' left visual field enhances the perception of the emotional expressivity only in portraits. It is thus not possible to completely rule out either the left visual-perceptual bias or the greater

physiognomic expressivity of the left cheek of the subject, which is controlled by the right hemisphere (traditionally regarded as dominant for emotional processing).

Overall, even though we are unable to explicitly recognize portraits and self-portraits, we seem to experience and explore them with our gaze differently. Self-portraits exhibit greater emotional and social salience, likely because within a perspective of communication of the author with the viewer through the work of art, a mediated form of intersubjectivity, the artist and the model coincide.

6 Conclusions

As argued by Alan Ricardson, "*Cognitive psychologists and neurobiologists alike see the expressive human face as a particularly salient object for cognition, given the enormous importance of establishing and managing relations with others for our sociable species, from infancy onward*" (2010, 65).

With the abovementioned empirical study, a series of questions that are at the crossroad of cognitive science, aesthetics, and art history were addressed experimentally. Confirming previous hypotheses (Freedberg and Gallese 2007), several studies have shown sensorimotor and empathic engagement with the visible traces of the artist's gesture (Sbriscia-Fioretti et al. 2013; Taylor et al. 2012; Umiltà et al. 2012), of actions depicted in works of art (Battaglia et al. 2011; Thakral et al. 2012), of emotionally expressive faces in non-artistic pictures (Adolphs et al. 2000; Mastrella and Sessa 2017; Pitcher et al. 2008), and of photos depicting one's own face (Uddin et al. 2005, 2007). Indeed, proprioceptive, and sensorimotor brain regions involved in the embodied simulation of gestures, actions, emotions, and sensations underpin the experience of both real and artistic images and content (Gallese 2019; Gallese et al. 2022).

A privileged access to the self (for a review, see Devue and Brédart 2011) may also entail a facilitation in self-representation. In self-portraits the artist's sensorimotor engagement in depicting his/her own image is greater, likely translating into more expressive vital forms of his/her artistic gestures, such as more expressive formal features. I posit that the privileged access to the self by the artist may be a privileged access to the motor gesture representing his/her own physiognomy, mimic expressiveness, and psychological state with respect to those of others. Indeed, one of the ways through which art moves us may be its expression of the vitality that resonate within us (Stern 2010; Gallese and Rochat 2018). Georg Simmel (1918) postulated that the efficacy of a portrait to communicate the subjective quality and most intimate essence of the portrayed person is accomplished by animating the pictorial image with movement, because it is animation to confer to the image psychophysical unity. If this is true, I submit that in self-portraits this can be optimally accomplished, because the sense of presence of the portrayed face and the gestures employed to depict it belong to the same artist's body.

The results here concisely presented suggest that it is time to abandon the outdated oculocentric concept of vision as a'purely visual' enterprise and embrace a novel model of visual perception according to which vision is a complex experience, intrinsically synesthetic, made of attributes that largely exceed the mere transposition in visual coordinates of what we experience any time we look at something, like the human face. The perception of portraits and self-portraits makes no exception. This new model of visual perception, which emphasizes the reuse of sensorimotor and affect-related brain networks, might shed new light both on how we perceive real faces and on the aesthetics of the human face as depicted in portraits and self-portraits.

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