



# Empathy in Sacred Paintings of Leonardo da Vinci

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## Abstract

Empathy, understood in its emotional, cognitive, and motivational dimensions, reveals itself in a singular way in the Renaissance sacred paintings of Leonardo da Vinci, in which the expression of human affects intertwines with the spiritual dimension. In his religious compositions, da Vinci amplifies the illustration of biblical passages by translating with sensitivity and technical rigor the emotional complexity of the portrayed figures. Taking into account the cognitive and emotional expressiveness of Renaissance sacred paintings, the main objective of this manuscript is to understand the representation of empathy in sacred paintings of Leonardo da Vinci. The specific objectives are to explain the emotional and cognitive biases presented by the sacred paintings of Leonardo and verify the techniques used in his paintings to evoke empathy in spectators. This research is exploratory and bibliographic in nature, involving a literature review, reading, logical organization of data, thematic discussion, and writing, with a theoretical–interpretive approach. Da Vinci meticulous investigation of human anatomy, allied with the mastery of innovative techniques, allowed him to describe gestures, gazes, and facial expressions among the characters capable of communicating emotional states in a subtle and intense way. The aesthetic experience provided by his paintings requires from the observer an additional involvement to sensory perception, mobilizing processes of emotion and cognition to understand the symbolic interpretation of his art. Not only do Leonardo's sacred works invite aesthetic contemplation, but also incite the spectator to act in an empathic manner and share the human and spiritual drama symbolized, establishing a link between art, emotion, and cognition. It is suggested that the arrangement of Leonardo's pictorial narrative and the techniques used in his sacred art stimulate the appearance of empathic abilities from the imagination and emotional and mental projection of the observer who contemplates his work.

## Keywords

Empathy; Emotion; Cognition; Sacred Art; Leonardo da Vinci

## 1. Introduction

Empathy, a word derived from the Greek *empathia* and translated from the German *Empfindung* as “to feel with”, refers to the imaginative capacity to put oneself in the place of the other, encompassing the understanding of their thoughts and emotions (Coelho, 2004). This concept occupies a central position in different fields of knowledge, such as philosophy, psychology, literature, and aesthetics (Coelho, 2004). The presence of the empathic ability in the observer of the aesthetics of art can trigger specific bodily reactions from what is visualized, such as alterations of the ocular muscles, of the limbs, and even of body posture (Vischer, 1873).

In this sense, the visual stimuli promoted by art were used as a didactic instrument in catholic evangelization, given that the large contingent of illiterate faithful would have difficulties regarding the comprehension of the contents present in the orally transmitted messages, making sacred art an instrument of catechesis (Jaluska, 2015; Suaiden,

2011, p. 66). This art can be manifested by an object to be admired for the essence of what it transmits, not strictly for what it is in concrete terms (Wisdom, 2009), and is intrinsically linked to images of worship in service of the divine, differentiating itself from religious art, which is associated with images of devotion (De Tommaso, 2018). The use of art in religion is essential, as it symbolizes the understanding and feelings that words cannot describe (Wisdom, 2009).

The first Christians, under the influence of Jewish tradition, demonstrated great hesitation in making artistic compositions of the divine (Jaluska, 2015), since the making of images, for fear of idolatry, was a biblical prohibition expressed in Exodus and Deuteronomy (de Oliveira, 2012). However, with the Renaissance, a period of rediscovery of art since the decline of the Roman Empire, the profusion of artistic compositions accentuated the narrative character of sacred art (Jaluska, 2015), in which Leonardo da Vinci, widely considered an influential artist, ascends as a Renaissance icon (Barnett, 2019).

Upon being hired by the Catholic Church and the court of Ludovico Sforza to produce works such as *Virgin of the Rocks* (1483) and *The Last Supper* (1498), da Vinci began to progressively incorporate an original trait of his artistic genius: the psychological narrative (Eugênio et al., 2021). These paintings were fundamental for the maturation of this style of art, in which the portrayed figures seem to express, through subtle gestures and facial expressions, a kind of internal monologue; thus, da Vinci sought to capture the movements of the soul at the instant of its artistic representation (Eugênio et al., 2021).

This concern to translate visually the emotions of the painted characters manifests itself especially in the painting of *The Last Supper* (1498), which, although it has several versions, da Vinci's is recognized by art historians as the most emblematic of the biblical passage (Musavi, 2017). When contemplating the face of Christ in this painting it is possible to perceive the deep pain in his expression (Musavi, 2017), an interpretation that aligns with one of the aesthetic responses in face of visual images proposed by Freedberg and Gallese (2007), such as the identification of the emotions of the portrayed figures in the promotion of empathy in the observer (Stamatopoulou, 2018).

This identification between the painting and the observer is achieved with the artistic technique of Leonardo da Vinci, who seeks a pictorial realism through the techniques of *sfumato* and *chiaroscuro* (Study, 2022), in addition to the use of perspective, which, for da Vinci, was not just a pictorial convention, but an essential component of his understanding of nature (Edgerton, 2018). The *sfumato* softens the transitions of color (Barnett, 2019) and is considered the most effective technique for conferring verisimilitude to the portrayed objects, especially when compared to the use of sharp outlines (De et al., 2010). The *chiaroscuro* uses contrasts between light and shadow and confers depth and three-dimensionality to the paintings, in opposition to a flat appearance (Barnett, 2019). The linear perspective creates the illusion of depth even on a flat surface (Blumberg, 2025), and the complex perspective allows the observer to contemplate the paintings both frontally and laterally (Ajzenberg, 2019).

Painting was considered by da Vinci a superior form of art due to the rapid capacity for cognitive and emotional expression of its content (Vecce, 2003), directing the observer to meanings and emotions difficult to clarify and evoke by other manners (Levett-Jones et al., 2024). Taking into account the cognitive and emotional expressiveness of Renaissance sacred art, especially of Leonardo da Vinci, the main objective of this manuscript is to understand the representation of empathy in sacred paintings of Leonardo da Vinci. The specific objectives are to explain the emotional and cognitive biases presented by the sacred painting of Leonardo da Vinci and verify the techniques used in his paintings to evoke empathy in spectators.

## 2. Material and Methods

This research is exploratory, as it provides an overview, of an approximate nature, of a certain phenomenon, and bibliographic, as it is based on already established material, mainly consisting of books and scientific articles (Moreira; Caleffe, 2008, pp. 69 & 74). The methodology involved a bibliographic survey, reading, logical organization of the data, thematic discussion, and writing. This study adopts a theoretical–interpretive approach, drawing on established frameworks from psychoanalytic theory, sociocultural theory, and neuroaesthetic perspectives to analyze artistic phenomena. It emphasizes the interpretation of meaning, symbolism, and viewer experience through theoretically informed analysis.

Data collection was carried out using the Scielo, Science Direct, and PubMed databases, as well as libraries and websites of various research institutions, universities, and academic and scientific repositories. The associated descriptors included: Sacred Art and Leonardo da Vinci; *The Last Supper* and Leonardo da Vinci and Visual Analysis; *Sfumato* and *Chiaroscuro* and Leonardo da Vinci and Artistic Techniques; *Virgin of the Rocks* and Leonardo da

Vinci and Visual Analysis; Leonardo da Vinci and Last Supper and Emotion; Virgin of the Rocks and Leonardo da Vinci and Emotion; Leonardo da Vinci and Masterpieces and Meaning; Symbolism in Art and Leonardo da Vinci and Religious Themes; Religious Art and Cognition and Empathy; Art and Empathy; Psychoanalysis and Empathy; Empathy and Neuroscience and Art Appreciation; Pain Empathy and Affective Components and Brain Research; Social Skills and Empathy; Affective Empathy and Cognitive Empathy; Art Appreciation and Cognitive Neuroscience; Artistic Experience and Emotion; Art and Creativity A and Imagination; Sacred Art and Emotion and Aesthetic Perception; Symbolism and Art; Vygotsky and Psychology of Art.

### 3. Results and Discussion

#### 3.1 Emotion and cognition in the sacred painting of Leonardo da Vinci

Although the concept of empathy has its roots in greek philosophy, it was through German Romanticism that the term *empathy* (empathy) achieved wide dissemination, especially through Theodor Lipps, who used it to clarify the experience of “feeling with” (Duque, 2018). When transposed to psychoanalysis by Sigmund Freud, the concept came to designate a predominantly cognitive process of understanding the other from the adoption of their perspective (Coelho Júnior, 2004), widely extended to art criticism in his work *Leonardo da Vinci and a Memory of his Childhood* (1910/2013). As the historian Meyer Schapiro (1956) analyzes, Freud’s work became a landmark by inaugurating an approach that sought, in the investigation of an artist's psychic life, a path to understand his work, establishing an inspiring example for the psychoanalytic interpretation of art.

The manifestation of empathy requires the integration of both cognitive and affective aspects, which are described in a distinct way (Roza & Guimarães, 2021; Wheelwright et al., 2006). The cognitive component of empathy requires the activation of complex cognitive functions, such as perspective-taking and mentalization (Roza & Guimarães, 2021). The emotional component, concerns the capacity to share or become involved with the emotional states of other people (Alarcão & Fonseca, 2020). Accordingly to Vignemont and Singer (2006), empathy is present if the person is in an affective state caused by the observation or imagination of the affective state of another person. In this way, involvement with art can stimulate empathic imagination (Levett-Jones et al., 2024), which is stimulated from the pictorial representations of Leonardo da Vinci.

The artistic productions created in the field of Art study depend on the articulation between perception, imagination, emotion, investigation, sensitivity, and reflection (Pimentel, 2013). Symbolic elements that appear with these productions assume a unique relevance by activating the creativity and the imagination of the observer, since the subject is led to experiences that allow them to access different ways of being, feeling, and acting that transcend the limits of their sociocultural reality (Borges & Naves, 2021). Consequently, the exercise of cognitive and emotional empathy is facilitated through the adoption of the other's perspective (Cerniglia et al., 2019).

In one of da Vinci's notes, he instructs artists to create their paintings in such a way that prioritizes the movement of the images instead of their beauty and perfection, so that the art comes into harmony with the mental attitudes of those who compose the narrative painting (Bambach, 2003). In this regard, Leonardo was dedicated to the study of anatomy with the purpose of improving the configuration of human proportions in his works both in forms and in movements, since expressions and gestures are manifestations of the internal processing of what we feel (Eugênio et al., 2021). This original conception of Leonardo is possible to be understood in works such as *Saint Jerome*, begun around 1480 and left unfinished (Zöllner, 2005). In the center of the composition, Jerome is evoked in a posture of penitence, wielding a stone that is about to strike his own chest, while his countenance expresses pain and sacrifice, and a lion — the traditional attribute of the saint — rests at his feet (Zöllner, 2005).

Contemplating the countenance of Jerome, for Vygotsky (1999), would be able to introduce us to a state of emotional resonance not by what the image objectively carries, but by what we are led to project. In this case, empathy does not arise because the image directly transmits an emotion, but because the spectator, by engaging with the work, triggers some emotional states that already belong to it on some deep level (Vygotsky, 1999). This phenomenon is based on the shared interpretation model of empathy, that is, when we observe someone in suffering, our nervous system automatically activates an internal simulation of this emotional state, reproducing neural patterns similar to those that would be mobilized if we were experiencing the same experience (Singer et al., 2004; Morrison et al., 2004; Jackson et al., 2005; Freedberg & Gallese, 2007; Lamm et al., 2016; Golbabaei & Borhani, 2024). Through the activation of mirror neurons, a somatosensory configuration of the other's emotional state occurs in our brains (Golbabaei & Borhani, 2024), so that, in the case of contemplating the work *Saint Jerome*, the pain expressed by the saint

can be internally simulated as if it were experienced by the observer.

In *The Virgin and Child with Saint Anne* (1508), da Vinci transforms traditional piety, normally associated with a kneeling figure, into an emotionally dynamic figuration (Kemp, 2003). The disposition of elements in the scene includes a lamb resting on the right, object of the affectionate caresses of the Child Jesus, and the animal functions as an attribute (Bambach, 2003) — a term used in Christian iconography to designate objects, animals, or symbolic elements that allude to the life or martyrdom of sacred figures (Schaeffer, 1966). In the context of this masterpiece, where the lamb symbolizes the Passion of Christ, the presence of Saint Anne gives solemnity to the scene and shows duality: transforms the interaction between the spontaneous impulse of the Child Jesus to touch the animal and the contained gesture of Mary in restraining him, into a manifestation of the mysteries of the Incarnation and the Passion (Bambach, 2003).

Regarding the position of Mary in relation to her son, Cavarero (2016, *apud* Coutinho, 2020) highlights the vulnerability of the Child Jesus and the asymmetry present in the composition of the scene, since Leonardo breaks with the traditional system by presenting the mother face to face with her son. This configuration of the relationship between mother and son expresses altruism in a context of interdependence between the subjects, with Mary's gesture of inclination being a manner of communication and disposition to welcome the other in their difference (Coutinho, 2020). The Western artistic tradition over the centuries similarly sought to express the affective proximity between Mary and the Child Jesus (Mombach, 2024, p. 191), which shows us that the gesture of inclining can be understood as a historically reiterated visual construction, as presented in the highlight below:

Artists of different movements, each using the techniques and particularities of their period, created works in order to represent the image of Mary and portray the biblical passages that tell her steps alongside her son (Mombach, 2024, p. 191).

It is noted that the corporal communication of this painting can trigger empathy, since it is in the act of inclining towards the child that Mary not only opens herself to otherness, but also finds herself, to the extent that it is in the relationship with the other that the subject is constituted (Coutinho, 2020). This symbolic corporal expression aimed to empathy and to the constitution of the self in the encounter with the other can also be observed in the way aesthetic elements are used to reinforce the bond between Mary and her son. Visual elements such as the veil and the colors blue and white reinforce values such as purity, sanctity, and devotion (Mombach, 2024). These resources, by constructing the image of Mary marked by virtues and maternity, can intensify her affective and relational dimension in the visual elaborations.

In the painting *Virgin of the Rocks* (1486), which has one version in the Louvre Museum (Paris) and another in the National Gallery (London) (Pina, 2019), Leonardo presents a rich and complex iconography, centered on the figuration of the encounter between the Holy Children, the Madonna, and the Archangel Gabriel (Smith, 1983). With a compassionate gesture, the Virgin extends her hand to the Archangel, inviting him to integrate into the sacred community (Smith, 1983) and thus stimulates the idealization of a bond of sensitivity between the spectator and the spiritual universe manifested in the work. The Archangel's gaze, turned towards the observer, can be interpreted as a call to interior contemplation and participation in the sacred mystery (BrazilArtes, 2024). The use of *sfumato* intensifies the mysterious and meditative atmosphere of the painting and its ambiguous nature — revealing and concealing — suggests that the visible or what seems to be known can lead to the invisible or unknown, allowing the sensory apprehension of the figures to an ineffable knowledge of the divine (Muraoka, 2024).

In the second version of the painting, finished in 1508, a halo is observed over the Virgin's head, a resource frequently associated with sacred figures and which potentiates the emotional experience by inducing a divine or supernatural presence that reinforces the affective impact of the work on the observer (Tufaile & Tufaile, 2023). The direct gaze of a figure can trigger a cerebral activation compatible with the subjective experience of being observed, possibly involving the spectator in implicit inferences about the possible mental and emotional states of the figure's subject and even suggesting a communicative intention (Kesner et al., 2018). This type of visual contact, used as an artistic resource to produce specific psychological effects in the observer, was widely explored in Renaissance portraits, in which the pictorial gaze frequently establishes a direct connection with the spectator's gaze and generates specific psychological effects (Kesner et al., 2018), as it is noted from the Archangel's gaze, which functions as an expressive mechanism that intensifies the visual experience of the observer.

This chapter had the purpose to explain the emotional and cognitive biases of empathy in sacred paintings of da Vinci. Affective and mental pictorial representations generated by gestures and facial expressions were highlighted. The next chapter will verify how the techniques employed by the artist, such as *sfumato*, *chiaroscuro*, and perspective,

contribute to demonstrate and evoke empathy in his sacred paintings.

### 3.2 Techniques in the sacred paintings of Leonardo da Vinci for expression of empathy

The pictorial techniques developed by Leonardo da Vinci proposed to confer natural originality to the images. The *sfumato* confers a mystical aspect to the images (Zöllner, 2005) and is obtained by the application of dark layers on the borders of the figures, softening the transitions of color and creating contours that seem covered by a mist, as Barnett (2019) explains. From 1483 onwards, Leonardo begins to experiment with *chiaroscuro* to, in addition to the purposes of articulating three-dimensional space or the plasticity of form, generate theatricality and, therefore, affectivity (Muraoka, 2024). This technique consists of the treatment of light and shadow, and is used to produce the illusion of depth and generate a dramatic effect (Upgren, 1998). By following the transformation of *chiaroscuro* as a vehicle of affect, from Leonardo's work in Milan, it is perceived that, under the influence of the Franciscans, this technique came to be used as a resource to intensify the observer's experience, leading them visually and mystically towards unification with God (Muraoka, 2024).

By employing the *sfumato* technique in *Salvator Mundi*, in which Jesus is expressed in half-length to create intimacy with the painting, da Vinci confers to the work a delicate gaze with a spiritual quality, inviting the spectator to veneration (Study, 2022). It is important to mention that the date of Leonardo's *Salvator Mundi* is a topic of debate, since after an initial thesis that Leonardo had developed the masterpiece in 1499, the dates that were meanwhile proposed vary between the years 1490 and 1510 (Zöllner, 2021). In the work, Jesus is represented as divine authority and da Vinci uses symbolism to reinforce this conception: the right hand raised in a gesture of blessing, a universal symbol of peace and protection, and the left hand holding a crystalline sphere, which represents the world and the totality of creation, reiterating the image of Christ as savior of the world (Study, 2022). This symbolism can be explained by one of the modalities of the symbol described by Vischer (1887), which relates aesthetic empathy to the way we attribute meaning to images, in which the image (the transparent globe, in this example) and what it represents (the cosmos) are connected, although they are different things (Vischer & Yanacek, 2015).

In *The Last Supper* (1498), da Vinci confronts one of the most celebrated themes of Christian symbology, choosing to fix the dramatic instant in which Christ announces to the apostles that the betrayal will come from one of those who there share the table with him (Chauveau, 2010). The scene is marked by the disposition of the characters, with emphasis on Judas, projected in the shadows, and by the use of linear perspective, which positions Jesus at the center of the composition, before a landscape that may symbolize paradise (Study, 2022). For Leonardo, linear perspective, an artistic technique that creates the illusion of depth on a flat surface (Blumberg, 2025), was not just a pictorial convention, but an essential component of his understanding of nature (Edgerton, 2018). From perspective, Leonardo was able to understand the schemes and structures underlying physical and biological phenomena (Edgerton, 2018).

Taking this perception of space into account, the use of the so-called complex perspective manifested itself in Leonardo's work, which makes it possible for the work to be appreciated from different angles, for example, frontally or laterally, promoting a coherent and dynamic spatial organization (Ajzenberg, 2019). This technical resource is articulated with da Vinci's intention to represent the intention of the human soul through the vivacity in the corporal movement of the scene (Araújo & Nascimento, 2019). The highlighting of the hands and faces confers dynamism and evidences the emotions of the characters in movements that seem to extrapolate the limits of the physical space of the scene, intensifying the dramatic quality and expressiveness of the whole (Ajzenberg, 2019; Isaacson, 2017). Thus, the painting delves into the psychological dimension by concentrating on the emotional state and internal reactions of the apostles before the revelation of Christ (Study, 2022).

In the work *Annunciation* (1475), in which the Angel Gabriel has wings similar to those of a bird and is inclined as if he had just landed, while the wind caused by his arrival stirs the grass and flowers at his feet, Leonardo presents his growing mastery of oil paints, which, with the use of delicate pigments, he was able to apply in thin transparent layers and to retouch with his fingertips (Ajzenberg, 2019). The picture, incidentally, can cause a certain strangeness to an inattentive observer, as it requires that the ideal viewpoint to look at the image be from one of its sides (Barbosa & Barbosa, 2021; Isaacson, 2017). Furthermore, by decomposing the work into a square and a rectangle, it is observed that the latter follows the proportions of the golden rectangle, that is, with harmonic proportions that resemble the beauty and perfection found in nature, allowing the central figures, the Virgin Mary and the angel, to be positioned harmonically within the area delimited by this proportion (Pinheiro et al., 2021).

In the manuscript *A Treatise on Painting*, published posthumously in 1651, Leonardo describes the way in which the human eye perceives the details of images and explains that in *sfumato* the borders of objects become

imperceptible to the eye (Soranzo, 2022). The absence of defined contours can influence the emotional recognition of the figures, considering that the six basic facial expressions — happiness, sadness, anger, fear, disgust, and surprise — are identified based on patterns of muscular movements that produce diagnostic signals for each expression, such as the raising of the corner of the mouth in happy faces (Todd et al., 2023). The *sfumato* makes the transitions between light and shadow of the *chiaroscuro* technique more diffuse, causing certain areas of the face, such as the shadows near the mouth, to be perceived in an ambiguous manner, since they are not clearly associated with a specific region (Soranzo, 2022). Thus, the perception of the image, in addition to depending on technical elements such as the distance of the observer, the angle of vision, and the sharpness of the visual configuration of the painting (Todd et al., 2023), are linked to the degree of involvement of the observer with the image and with the moment in which they find themselves, being able, from its contemplation, to provoke in themselves certain thoughts and emotional reactions.

This chapter focused on the analysis of the pictorial techniques used by Leonardo da Vinci, highlighting how resources such as *sfumato*, *chiaroscuro*, and perspective, both linear and complex, contribute to the evocation of empathy in the sacred paintings. Next, the final considerations are presented, which synthesize the main findings and reflect on the contributions of this study to the understanding of empathy in the sacred paintings of Leonardo da Vinci.

#### 4. Conclusions

The analyses developed throughout this work demonstrated that the sacred paintings of Leonardo da Vinci mobilize empathic processes by integrating visual elements that trigger both cognitive and emotional dimensions of the observer. The representation of affects through facial expressions, gestures, and symbolic compositions reveals an aesthetic concern aimed at the subtle communication of the internal states of the portrayed figures. By stimulating imagination and affective identification, such works promote a sensitive involvement that transcends formal contemplation and brings the spectator closer to the spiritual and human experience of the figured biblical scenes.

It was verified that the pictorial techniques employed by Leonardo da Vinci act as technical resources for spatial organization or illusion of depth, and as expressive devices that intensify the emotional content of the compositions. These techniques potentiate visual ambiguity, deepen the symbolic dimension of the figures, and broaden the empathic experience by directing the observer's gaze to internal states suggested by the variations of light, the fluidity of the contours, and the corporal dynamics of the sacred characters.

From these findings, this study contributes to the interdisciplinary field that articulates art, emotion, and cognition, evidencing how the artistic production of Leonardo da Vinci can be understood as a privileged means of empathic evocation.

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