Embodied musical empathy from Vivaldi to Puccini and beyond

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This study explores the relationship between music, the body and perception, proposing an addition to the reductionist approach of musical analysis. Using examples from the instrumental and operatic repertoire, it shows how music elicits spontaneous sensory and motor responses, suggesting a possible link between the action-perception cycle and musical empathy. A holistic view of music is proposed that integrates formal analysis with embodied experience, emphasising the role of emotion and musical affordances.

Keywords: affective affordances; embodied music; sense-making; extended mind

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1. Introduction

The appeal of a piece of music is not necessarily determined by its complexity or aesthetic sophistication; rather, it is contingent upon its ability to engage the body and emotions. The possibilities for interaction offered by music vary according to individual and cultural experiences. Section 2 introduces the concept of musical extension, which allows for a dynamic interaction between the individual and the piece, in which musical sense-making emerges from the mutual appeal of the affective and perceptual dimensions.

Furthermore, the musical experience is subject to variation in accordance with the affordances that a given piece engenders, exerting an influence on and modifying emotional states through interaction with the environment. In support of this proposition, a reflection on measurable emotional responses, such as facial expressions, is proposed in Section 3.

Whilst traditional, fundamentally computational musical analysis is indispensable, it does not exhaust the complexity of musical experience. In this sense, it would be beneficial to complement this vision with a perspective that considers the sensory and embodied dimensions of music.

In Section 4, a proposal is made to introduce concepts of attractive force and harmonic quality, paving the way for a more holistic analysis that recognises the role of the action-perception cycle and the emotions embedded in the musical experience. The second part of the discussion focuses on brief examples taken from the instrumental (section 5) and operatic (section 6) repertoire, in which it is possible to find confirmation of what was previously stated and highlight the embodied character of musical affectivity.

2. Embodiment and musical extension

Human beings have always used media that have modified their interaction with the environment: if we consider music as one of these media, we realise that it allows for a true extension that, starting from the elicitation of a non-manifest motor activity, results in the attribution of meanings to what would otherwise be nothing more than a sequence of oscillations of particles (sound waves) in a physical medium of propagation (air).

Music, then, like Otto's famous notebook mentioned by Clark and Chalmers (1998), can also be conceived of as an extension (Clark 2003): specifically, we can think of a bodily extension that makes us experience sensations of movement that do not result in actual concrete actions, but which activate the neural patterns of the movement itself without it manifesting itself. Listening to certain pieces or passages, each of us has lost contact with the here and now and experienced sensations of growth, shrinking, speed, slowing down, constriction, opening, vertigo, etc. Music enhances our perceptual and motor possibilities, allowing us to move in increased spaces and in ways that would otherwise be impossible. This concept is different from pure imagination, but rather motor and visceral sensations, which have no visual or eminently representational counterpart.

The close connection between music and the range of sensorimotor possibilities brought to light by this latter conceptual approach opens up

further possibilities for reflection regarding musical sense-making. More specifically, bearing in mind the protomusical behaviours and teleomusical acts of children and adults (Schiavio 2017) and the physical and motor sensations generated by musical listening, we could hypothesise that the process of musical sense-making is connected to embodied empathy. Traditional approaches to musicology, formal analysis and harmony, while inescapable, only consider the phenomenon from a computational and reductionist point of view: what if instead of starting 'from the head' everything started 'from the feet'? What if the reason why a composition is more or less appreciated -or at any rate understood in cognitive and emotional terms- is not to be found in the inventiveness through which combinations of sounds are particularly effective on the basis of a purely aesthetic criterion, but is rather to be found in the innate capacity of human beings to embodilly and affectively extend themselves? In fact, it is not enough for a composition to be extremely complicated for it to be perceived as 'beautiful', but sometimes we are even aware of the compositional paucity and banality of a piece that we nevertheless cannot stop listening to. The extremely subjective character of musical experience is not an obstacle to this approach, but fits into it in an absolutely natural way, considering that even the concepts of extension and affordance have a subjective character; affordances, in fact, have both a subjective and an objective character, and furthermore are in no way universal, on the contrary, in a Wittgensteinian perspective, expressly recalled by Gibson «The theory of affordances rescues us from the philosophical muddle of assuming fixed classes of objects, each defined by its common features and then given a name. [...] You do not have to classify and label things in order to perceive what they afford»[1].

Hence, between one individual and another, between one social group and another, between one ethnic group and another, etc., various factors intervene that ensure that the perceptual outcome is not exactly the same for everyone, precisely because affordances are not intrinsic properties of

[1] Gibson *The ecological approach to visual perception: classic edition*, Psychology press 2014, p.134

the object, just as musical affordances are not intrinsic properties of the piece of music.

3. Affective affordances in music

Musicality *lato sensu* is a phenomenon constructed from a dynamic interaction that can exhibit different configurations, also by virtue of the type of fruition. In musicality in general, emotions are certainly involved, but emergent events characterised by greater intensity and duration of time, such as moods, are configured more as correlates of the primordial sphere of affectivity. It is possible to understand the meanings of musical behaviours as emergent properties that are co-constituted through multiple interactions that cannot be limited to the emission of an input from a sender to a receiver. Without going too far beyond everyday experience, one can consider simply listening to a piece of music, or producing music through a musical instrument, or performing in public, or even performing in an orchestral formation. All these different types of interaction involve different modes of communication, in which the medium is always music, but the emotionality is conveyed in different ways. If we consider the case of a musician who plays for himself, shut up in his room, then we consider the interaction between the subject who extends himself into his instrument and benefits from the emotional elicitation that he induces himself and that is amplified by the very interaction with the instrument. If, however, we add to this the presence of an audience, then it is no longer a matter of enjoying a self-induced emotional circuit, but of establishing an interaction in which the audience's emotionality is stimulated. If we then extend the scenario to include orchestral performance, we are describing a new system, an organism whose participants breathe in unison and whose purpose is to consciously move the audience's emotions. In this case, the performing musician is no longer simply concerned with an immediate and direct benefit to himself, but with a secondary emotional effect resulting from the

successful outcome of the intention to excite others, who thus contribute to the emergence of this affective-emotional state. What is described can be approached with the notion of affective affordance, which concerns the ability of humans to convey, regulate and modify emotional and affective states in a situated way by relying on items belonging to the cultural, social and material environment (Krueger and Colombetti, 2018). According to this, phenomena involving affectivity are not due to or partially constituted on the basis of the surrounding environment, including objects and technologies (Piredda, 2020): emotional states, feelings and moods can arise from interactions with these elements.

In this direction, several studies have been conducted to investigate the emotional involvement associated with the administration of musical stimuli. For example, Chan et al. (2013) investigated emotional responses to vocal musical performances through the analysis of facial expressions after listening to music, highlighting how a sad musical performance is associated with increased activity in the corrugator supercilii region, while a happy musical performance corresponds to increased activity in the zygomatic region. The emotional responses demonstrated by facial expressions are found not only in adulthood, but also when musical stimuli are presented to fetuses (López-Teijón, et al., 2015), so it is possible to conclude that these are not learned behaviours.

4. Affective-embodied musicality and harmonic qualities

What has been said so far should be understood not only as the result of listening to music, but starting from the ideational approach underlying the realisation of the composition itself; this can also have a great impact on the study of harmony and musical analysis, disciplines that have always been approached from a reductionist point of view, highlighting only relations and causal links based on computational criteria. Traditional harmony has treated music as traditional mathematics has treated scientific phenomena,

reducing them mechanically according to the Cartesian method: this does not mean that this is a wrong approach, but only that it is neither the only possible nor the most complete. Indeed, if we were to consider phenomena only in their globality and in their enactive dimension, it would be almost impossible to understand them, since a certain degree of reductionism allows us to comfortably "divide" reality into small parts, remembering that the part is not the whole, but neither is the sum of the parts the whole.

An early germ of the need to return music to its complex, multi-sensorial reality can be found in the notion of a field of attractive forces, introduced in the second half of the 19th century by the harmonicist Auguste Barbereau: he hypothesised that each note (constituting a gravitational point of fifths) is subject to the attraction of centres of force and that the movement it generates is based on the law of least action (a variational principle used to determine the equation of motion of a dynamic system). Shortly afterwards, Ernst Kurth developed another aesthetic concept that fits in perfectly with the previous ones, namely that of the conservation of energy: in addition to the movements already mentioned, he asserted that kinetic energy is inherent in the thematic lines and the trajectories they describe, while potential energy is present in the verticality of the textures (Bent 1990).

Following this line of interpretation, in recent years some musicologists have proposed replacing the concept of harmonic function, which is based on the succession of degrees and describes relationships in tonal music (De La Motte, 1988), with that of harmonic quality (Mastropasqua 2014), which recalls the gestalt concept of psychic configuration and thus indicates an internal sound representation (Mastropasqua 2015)[2].

According to this concept, five categories of energy can be distinguished: Accumulation, Attraction, Dispersion, Diversion/Contrast, Stasis. The category of accumulation represents a preparation of the force to 'snap' (like a charged spring) towards the dominant element (which instead has an

[2] «Il concetto di 'qualità' armonica distingue tra tipi di configurazione in termini di energia psichica – assolutamente non nel senso di una metafora, ma di esperienze vissute, come sensazioni primarie di movimento o assenza di movimento» (Mastropasqua 2015 p.2).

attractive character), thus it can be identified with the subdominant chord within a cadence. The centrifugal property with respect to the tonic leads to a weakening of gravitation around the sphere of the tonic, becoming something 'other' than it (diversion) or achieving a momentary opposite polarisation (contrast). Dispersion is the dissipation of energy caused by deceptive motion, i.e. the dispersion of the dominant's energy into a chord that is not that of resolution. What has been said so far reveals a certain tendency on the part of scholars of harmony and musical analysis to relate the usual approach to the evisceration of a piece of music to an embodied concept, at least in so far as movement is perceived. The question then arises: if there is undoubtedly an energy responsible for variously characterised movements, and we are not dealing with a visual datum, where does this perception of movement come from? How do harmonicists (and listeners) perceive these movements? In my view, the answer lies in the multisensory and multimodal nature that underlies musical perception. We can start with musical listening, musical production or analysis, but we will always end up with a multisensory experience that reflects the action-perception cycle.

5. Musical embodiment and affective engagement

Consider Paganini's Capriccio No. 13 (from *24 Caprices for Solo Violin* Op. 1): music teachers know very well that when it is offered as a first listening (especially to children), students will start laughing after the first two bars. The bichord figurations, which take a run-up and then catapult into a chromatic descent in thirds, elicit an involuntary reaction of laughter from the listener, so much so that Capriccio 13 is better known as *The Laughing Capriccio*. This is not a reaction due to any other conditioning, since we are talking here about reactions that arise spontaneously, without any prior communication of the second name given to the Capriccio, nor any mention of what is to be expected. It could be argued that this is an involvement due

to the mimetic and almost onomatopoeic nature of the repeated figurations that characterise the Capriccio, but this would not change the substance of things. Beyond the curiosity of this scenario, one can consider the evidence of a sensory link that goes beyond the auditory source and crosses over into the sensorimotor, even with regard to instrumental music. In this type of composition, there is a direct relationship with the music alone, since not only is there no visual representation of what is happening, but there is also no text associated with the music (as is the case with programme music, for example). The relationship that we want to highlight here must have been known (though certainly not in its neuroscientific connotations) to the composers who devoted themselves to programme music, a composition that had the task of telling a story or describing a scene through music. One of the earliest composers of programme music was Antonio Vivaldi, who, in his most famous work, *The Four Seasons* (the four opening concertos for violin, strings and basso continuo contained in *Cimento dell'armonia e dell'inventione* Op.8), wanted to give the listener an immersive experience, so much so that, to guide his listening, he placed alongside each season a poetic composition (probably written in his own hand) describing what the listener should perceive (Fertonani, 1998).

A special and more elaborate type of programme music is the symphonic poem, which is extended in terms of orchestral ensemble and narrative. Composers who have ventured into this genre include Hector Berlioz with his *Sinfonia fantastique* (Op. 14), Camille Saint-Saen and Claude Debussy. programme music and the symphonic poem are the explicit declaration - even by the composers themselves - of a correlation between different sensory spheres that intersect and complement each other with the aim of deliberately achieving an embodied musical experience.

6. The score as a directing script

One of the most obvious manifestations of the multimodality of the musical experience is operatic music: unlike other genres in which the message is conveyed by instruments and/or voice, the case of operatic music is more complex in that it adds to the instrumental and vocal music (and thus to the verbal message) the simultaneous visual manifestation of the staging. The singers move around the stage, performing music, words and gestures according to the score, following precise rules and the composer's instructions. Although there is no shortage of examples of daring stage reinterpretations, the director's intervention remains (or should remain) subordinate to the composer's original will, which is always well expressed in the score. However, the way in which the composer communicates his instructions is not exclusively verbal: it is possible for composers (or librettists) to accompany the opera with specific notes on the details of gestures, movements, etc. Often these clues are simply notes written directly in the score, corresponding to the bars to which they refer, but often they are implied between the notes. These are not cryptic messages that can only be deciphered by expert musicologists or conductors, but rather elements that can be understood by musicians and performers (albeit always in the way that best suits the director or performer). In essence, the music of great theatrical scores is itself a script, containing many more prescriptions than are verbalised in the margins. Bekker (1931) notes, for example, that the score is not a purely musical recording at all, the score being a *Spielanweisung*[3] (Hailey 1994). Gallarati (2007) reiterates in this regard that the musician plays the role of the first director of the drama created by the librettist, giving indications on the visual aspects of the performance through the language of music: therefore, the gesture that expresses rhythm in visual form is already present in the score and the director's task is to make it visible and interpret it in its various aesthetic

[3] *Director's script*

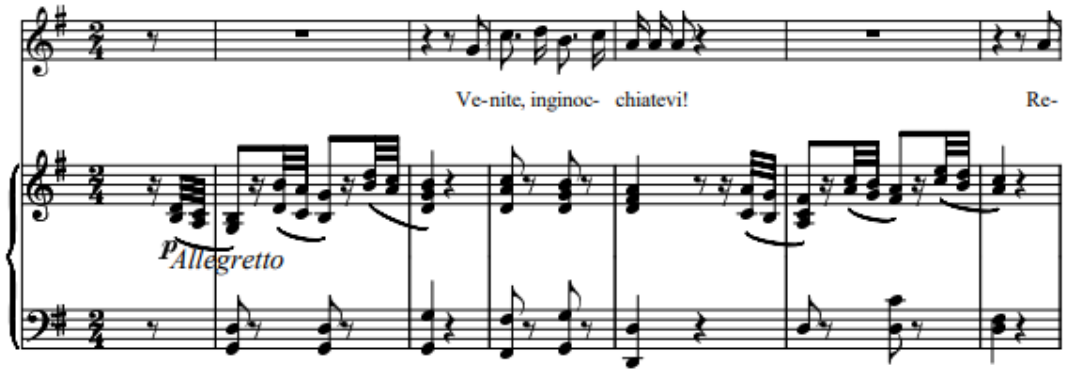
nuances (Gallarati 2007). Proof of this can be found in the case of the composer Richard Wagner, who, like Giacomo Leopardi, for example, wrote commentaries on his own texts in the Zibaldone, providing us with one of those rare cases in which posterity can benefit not only from the work of art, but also from the author's communicative intention, which he himself communicates. In fact, Wagner is the author of numerous essays in which he comments on his own operas (probably feeling the need to do so because of the many innovations he brought to musical theatre), sometimes also clearly explaining his idea of directing. For example, in *The Flying Dutchman*, he meticulously studies the movement of the body in space and the gesture of the gait when, at the beginning of Aria 2, the appearance of the protagonist on the stage is accompanied by an E flat played by the ophicleid, pizzicato double basses and bassoon, followed by the swaying of the strings (cellos and violas) and an ascending interval of diminished fifths played by the horns in the second bar; the entire figuration is then repeated in the following bars (bars 3-4 and bars 7-8). Wagner himself describes the scene by pointing out that the Dutchman's arrival on dry land is marked by a precise correspondence between the music and his movements. The deep E-sharp in the basses that opens the refrain of the aria coincides with his first step; the uncertain gait typical of a sailor after a long voyage is emphasised by the swaying movement of the cellos and violas. In the third bar, the Dutchman takes a second step, keeping his arms crossed and his head bowed, while the third and fourth steps are synchronised with the notes of the eighth and tenth bars, and then proceed more freely, following the natural flow of the musical performance (Giani 2019). Here, then, is the exquisite directorial function of the clues already present in Wagner's music itself. Wagner is the author of various commentaries and essays on his own works, but he is also a profound innovator of 19th-century theatre and music. However, we can also point to similar examples of music becoming a vehicle for a directorial indication (and thus for acts proper) in other compositions by other authors. This is by no means an isolated phenomenon:

almost all composers have implied gestures and actions in their scores, without feeling the need to express them explicitly: the fact that they have not felt the need to indicate verbally certain information that is considered to be already well expressed in the music itself is a sign of the existence of an innate capacity for understanding, not only on the part of the composer, but certainly also on the part of the "laymen" who make up the audience of the music. In this way, real musical labels are defined, which can be more or less related to the verbal labels already present in the score. When the music follows something that has already been prescribed by a commentary, we have explicit musical underscoring, whereas when the music suggests the action without any verbalisation, we have implicit musical underscoring. On the other hand, the extreme form of musical subtitling is the so-called mickeymousing or underscoring, i.e. a correspondence between music and action that is so synchronous and ostentatious as to produce a comic effect (often used in cartoons). Based on the classifications made by various musicologists and music historians (Bianconi 2005; Surian 1987), it is possible to distinguish different types of musical captions according to the type of action or the complexity of the movement on which they are based: gestural captions, movement captions, action captions, expressive captions. Here are some examples of these types of captions, taken from the Italian operatic repertoire.

6.1. Mozart and Cherubino's musical gestures

An eloquent example of what has been said so far is Aria No. 13 *Venite inginocchiatevi* from Wolfgang Amadeus Mozart's opera *Le nozze di Figaro*. It is an aria sung by the character of Susanna (soprano), who has previously hatched a plan to expose the true intentions of the Count of Almaviva, to whom she is in service, but who is pursuing her with unwanted advances, despite the fact that she is about to be married: She will have the page,

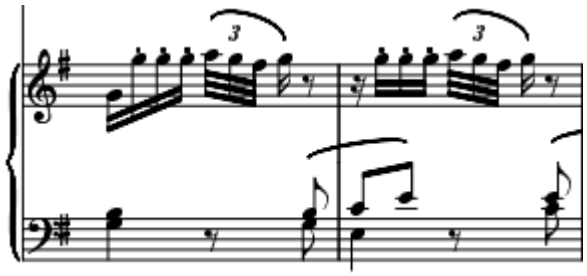
Cherubino, dress in his own clothes and, disguised, bring him to meet the Count, lurking with the Count's wife to catch him red-handed while he tries to have an amorous encounter with someone he believes to be Susanna. This is a so-called action aria, i.e. a piece in which the focus is not on the expression of an emotion but on the execution of a series of gestures and actions (in this case Cherubino's disguise). A peculiarity of the aria is that there are three characters on stage - Susanna and Cherubino in action before the Count - but only one sings: Cherubino's presence and movements are conveyed by instrumental music alone. The aria begins with descending eighth notes played by the strings, in a symmetrical figuration formed by an antecedent (bars 1-4) that starts from the tonic and reaches the dominant, followed by a consequent (bars 5-8) that returns to the tonic.



These first bars contain a verbal indication in the score, where we read «Susanna prende Cherubino e lo fa inginocchiare davanti poco discosto dalla Contessa che siede»[4]: it would therefore seem to be an explicit musical caption, i.e. a correspondence between the action condensed in the notes and the one explicitly indicated (De Matteis 2016). On closer inspection, however, the music does not recall Susanna's actions as indicated in the verbal caption, but rather provides the counterpart of what Cherubino does (i.e. obeys the command and kneels down). While Susanna tries to comb, make up and dress Cherubino, the latter is rather embarrassed, perhaps

[4] *Susanna takes Cherubino and makes him kneel before the Countess, who is sitting*.

even a little annoyed, and with the indiscipline typical of his young age, he recoils and makes himself repeat the commands several times before carrying them out: this is musically represented by the darting figurations of the triplets after the ribattuti, which are repeated several times throughout the aria (played by woodwind and strings in doubling).



Here the director will be careful not to fall into the above-mentioned over-scoring, avoiding a slavish adaptation of Cherubino's movements and those of the woodwind, with a kind of tailing of the visual action by the music (Beghelli 2003, p.570). The actions suggested by the music do not consist of movements realised mimetically, nor is their meaning exhausted in their execution, since the musical figurations highlighted so far have the task of making us perceive the actions in terms of intentions. It is true that the woodwinds move as capriciously as Cherubino, but the implied action is to be understood rather as a characterisation of the character, as on a sonic anthropomorphism, which makes Cherubino's feelings palpable and materialised through his actions.

6.2. Puccini and Liù's motor and emotional gestures

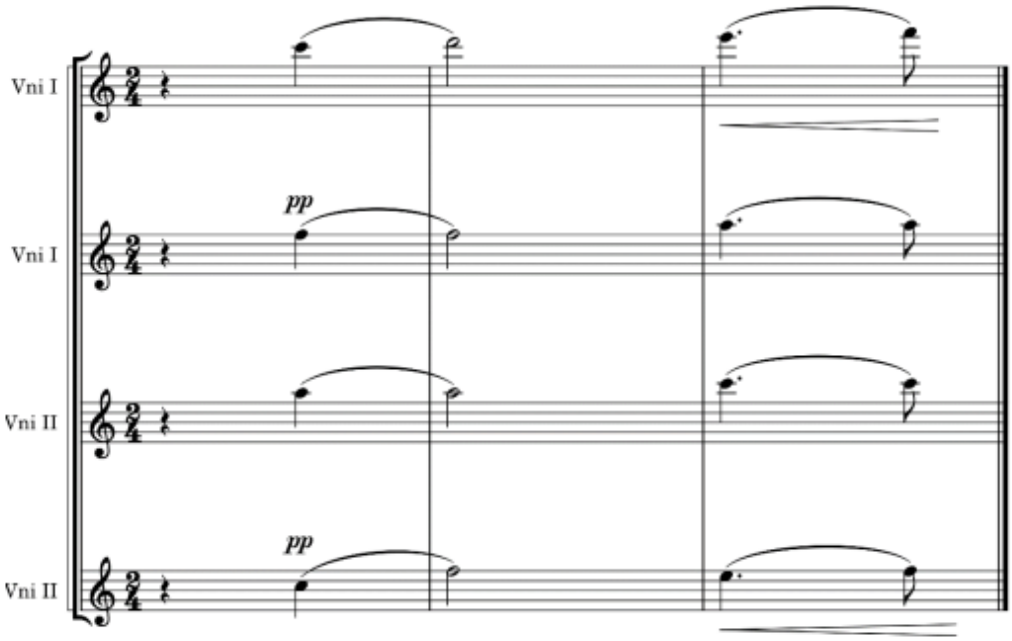
Another famous example in which we find a concomitance of implicit gestural, action and expressive musical clues is Puccini's *Turandot*, in which both the music and the psychological depth of the characters are of particular importance. What we want to highlight here is the way in which the music actually conveys movements and moods that do not always

correspond to the sung text, creating a characterisation of the character that is so well executed that it makes it extremely easy to empathise with the action and the character.

In Puccini's opera, the second aria of the Chinese slave Liù is the central point of a climax in which the two female characters (the slave and the Princess Turandot) have their first direct contact and the hierarchical order between them begins to experience the first emotional shocks, before being completely undermined in the following aria. The first scene of Act III gives a lot of space to the character of Liù, who shortly afterwards sings two arias of particular conceptual poignancy; in fact, there is a fusion between the two female characters that begins when Liù pronounces the name of the mysterious origin of her strength, which arouses the curiosity of the Frost Princess. («chi pose tanta forza nel tuo cuore?»[5]). At first, the princess approaches the slave with the only language she knows, that of violence: this is the key through which she understands the whole world, including human relationships, and in particular those between men and women (which she has in fact seen dysfunctionally materialised in the abuse suffered by her aunt Lo-U-Ling, whom she professes to avenge). Liù answers this question in an extremely delicate way, with a sweetness enhanced by the compositional choice of often leaving the violin alone with a small harmonic carpet. Thus begins the description of something as inexplicable as love, and the aria reflects this sense of ecstatic wonder mixed with suffering in enigmatic tones (underlined by fourth harmonies). The way in which Liù resists suffering and even asks for more as a supreme gift for her beloved Prince Calaf is also reminiscent of something very close to religious martyrdom, creating another parallel with Turandot, who had claimed not to be human but to have a divine nature. The most obvious expressive difficulty in this aria is to make credible the strength in the affirmation of her love for Calaf and the physical weakness due to the torture she has suffered; the performer must therefore functionally calibrate the dynamics

[5] *who placed such strength in your heart?*

to create a coherent but not predictable effect. In the score, at the beginning of the aria (III.24.1), we find the explicit indication that 'she lifts her eyes full of tenderness', and shortly before, when the Princess reveals that it was love that inspired her strength to resist everything, *dolcissimo* is indicated. Liù therefore raises her eyes, as indicated in the score, to address the Princess just before she begins a solo, in the last two bars of III, 23, in accordance with the explicit verbal indication of the expression *dolcissimo*. The gesture that Liù makes in addressing the Princess (which could be the raising of her head or simply her eyes) is emphasised by the violins with an ascending scale in the range of a fourth: a similar figuration, reminiscent of the previous one, is found throughout the aria, condensed into just two semi-notes at a distance of a second ascending.



Although this could be understood simply as an extension of the cell, recalling the violet motif of III, 21, 9-12, another interpretation (which would not exclude the former) could consider such a figuration as an implicit musical caption, prescribing a gesture by Liù, who, in correspondence with the two ascending semimini, raises her head towards the Princess. The slave girl is tortured in the presence of Turandot, who always appears in the

scene in an elevated position above everyone else, making the gesture of looking up to address her necessary. Similarly, the ascending scale in III, 23, 12-14 can be understood as an implicit musical caption for the movement and gesture in which Liù approaches the Princess and looks up to answer her question («chi pose tanta forza nel tuo cuore?»[6]); Obviously, the slave girl, surrounded by Turandot's guards, can only take a few steps towards her. The figuration of the two ascending semiquavers, which we have identified with the gesture of raising the head or turning towards Turandot, recurs in bb. 1, 3, 5, 7, 11, 19, 17, in unison with the soprano only in b.11, where a greater expressive force is required in correspondence with the word tacendo: in fact, after a pause of three and a half bars, flutes and oboes also enter, as well as horns, cellos and double bass, which had remained silent until then. It may seem superfluous to point out the moments when the character has to make the gesture of addressing her interlocutor, but let us not forget that Liù is being tortured at this moment, so she probably does not even have the strength to support herself; in support of such an interpretation, in the soprano's pentagram there are several crescendos and diminuendos (bb. 5-6, 11, 13-14, 20-21), describing a swinging vocal line, in which one can see the woman's attempt to speak, perhaps to cry out her love for Calaf, made futile by the hardships. In addition to the already mentioned bar 11, a moment of great tension is created by bar 21, prepared by the crescendo that begins at bar 18 and by the intervention of the horns in F, which contribute to the feeling of a violent and belligerent resistance to the pain, which is shattered by a sudden diminuendo as soon as A4 is touched, in contrast to what would be spontaneous, that is, to expand and grow on the high notes. Puccini creates an effect of ecstatic wonder by matching Liù's meaningful words («Legatemi straziatemi! Tormenti e spasimi date a me! Ah come offerta suprema del mio amore!»[7]) with the crescendo just mentioned, which peaks in bb 20 and the first half of bb 21

[6] *who placed such strength in your heart?*

[7] *Bind me, tear me! Torment and pangs give me! Ah as the supreme offering of my love*

(with flutes, oboes, English horns, clarinets, bassoons, contrabassoons and horns in F) and then unexpectedly drops from F to pp within the same bar, silencing oboes, English horns, clarinets, bassoons, contrabassoons and horns from the second half of bb 21 and introducing piccolo and harps. The communicative effect of the aria is based on the defiance of expectations, on the contrast between Liù's physical weakness, exhausted by fatigue and suffering, represented by the orchestra, and the strength of her soul, conveyed instead by her words. Just listening to the aria, without seeing the opera live, one can feel a sense of malaise and fatigue, even though Liù's words are those of an extremely courageous woman who faces death and torture for love. The explanation for this may lie precisely in the juxtaposition of two different messages, one entrusted to words and the other to music, one with a purely denotative meaning (the verbal) and one that is instead "translated" into a sensory-motor and visceral experience (the musical). Shortly afterwards, Liù decides to commit suicide in the presence of the Princess, approaching her with a trampling step represented by the descending progression and the claudicant rhythm of the strings: these steps are also taken by the listener together with Liù, he experiences them in an embodied way, like those of the Flying Dutchman (see above). Despite the fact that the steps are always the same, we are able to distinguish the specificity of Liù's step from that of the Dutchman simply by listening.

7. Conclusion

The analysis of the proposed texts leads us to the conclusion that musical experience goes beyond mere formal understanding and includes a sensory and embodied dimension. The traditional reductionist approach, which separates mind and body, does not allow us to grasp the complexity of the musical phenomenon, relegating music to the realm of the *res cogitans* and considering it a theoretical construct, separate from the body and the

emotions. Musical perception is an active and subjective process, influenced by individual and cultural factors, in which musical affordances, especially affective affordances, contribute to the emergence of our states of mind. It is therefore necessary to go beyond a purely formal view of music and adopt a holistic analysis that takes into account the sensory and embodied dimensions. Studies showing reactions even in the prenatal period suggest that music is a universal and innate medium, capable of arousing shared emotions and sensations, leading to an empathic connection between composer and listener. The proposed examples have shown how this can be found in the instrumental and operatic repertoire, regardless of the cultural-historical moment (and thus the specific musical language belonging to the different periods of music history).

Instrumental music can evoke direct sensorimotor responses without the need for text or visual representation, as in Paganini's *Capriccio* No. 13. Attempts have been made to increase this correlation with programme music, such as Vivaldi's *The Four Seasons*, by accompanying the music with descriptive texts. The symphonic poem, an evolution of programme music, extends this correlation. Both genres demonstrate composers' awareness of the interaction of different sensory modalities to create an immersive and embodied musical experience.

The aria *Venite inginocchiatevi* from Mozart's *Le nozze di Figaro* illustrates how music can express actions and intentions, not just feelings. Despite the presence of a caption describing Susanna's actions, the music focuses on Cherubino's movements and reactions, creating a sonorous anthropomorphisation of the character. The musical figurations, such as the darting triplets, do not simply mimic Cherubino's movements, but reveal his character and intentions, offering both narrative and psychological elements.

Puccini uses music to reveal the psychology of the characters, creating an empathetic experience for the listener. Liù's aria is a climactic moment in which her inner strength contrasts with her physical weakness caused by

torture. The cues in the score emphasise Liù's gestures and emotions, but the music amplifies these gestures, creating a sensory and visceral experience for the listener. The contrast between the strength of Liù's words and the physical weakness expressed by the music creates an effect of defying expectations, making the aria particularly moving. Even without seeing the opera, the listener can feel Liù's discomfort and fatigue as the music evokes her uncertain steps towards death.

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