

The Anatomy of Musical Thinking and the Architecture of Sonorous Consciousness: The Role of Musical Analysis in Cultivating Aesthetic and Cognitive Intelligence

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ABSTRACT: Music addresses both the soul and the spirit, yet it is equally grounded in a profoundly intellectual process, whether we refer to creation or performance. The result of this interplay between the emotional and the rational is a complex phenomenon, to which we relate through a unique psychological impact, shaped by the deeply subjective nature of musical experience and of human nature itself. Nevertheless, there exist stable cognitive dimensions that delineate a set of parameters widely acknowledged as the fundamental framework underlying the realization of the musical act. The integrative discipline *Musical Analysis* provides a radiographic probing of these mechanisms that shape the structure upon which music is constructed, from its incipient stages to its final form, offering the musician a clear understanding of the internal architecture of a musical work and of the relationships among its constitutive elements. Through analysis, the student develops an advanced form of musical thinking, capable of integrating or projecting auditory experience from within the intimacy of the creative act directly into the consciousness of the listener. This mechanism transcends the status of a mere method, generating a psychological process that shapes both the approach to music and the cultivation of the musician's intellect, while also contributing to the psycho-emotional impact that gives rise to aesthetic experiences.

Thus, musical analysis models the anatomy of musical thinking and supports the formation of a mature, informed, and consciously assumed artistic identity.

KEYWORDS: musical analysis; neuroscience; musical thinking; aesthetic experience; cognitive processes; sonorous consciousness.

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Introduction

How do we perceive music, how do we come to understand it, and what determines this understanding?

Music is a **complex phenomenon** that addresses **human sensitivity**, yet it also encompasses a **profoundly cognitive dimension** involved in the three fundamental modalities of sonorous manifestation: creation, performance, and reception. Although it is perceived as a succession of events unfolding in time, its particular details often remain concealed from immediate consciousness. With the exception of extreme musical Aleatorism, any musical work is “projected” from one or several sonorous entities that emerge, evolve, mature, transform, and undergo continuous metamorphosis along a trajectory conceived from the very stage of the creator’s intention. This process generates what we call the structure of a musical work, which includes both the form through which the musical substance, infused with potentiality, becomes crystallized, and the broader directions in which the constitutive elements of musical language are developed. The understanding of this structure does not arise intuitively (although the function of its components may be intuited at this level), but rather through **musical thinking**, which cultivates the capacity to identify tonal or modal relationships, compositional schemes, types of musical textures, elements of musical syntax and morphology, and other such typologies.

Complementarily, the manner in which this radiographic probing of music is assimilated and integrated into the listener’s mind transforms auditory perception into a far more refined and complex experience. This is what we call the **architecture of sonorous consciousness**, representing the higher level of musical thinking, responsible for penetrating subtle nuances and for cultivating more elevated aesthetic sensibilities.

The primary instrument underlying these modes of perception and awareness of the sonorous dimension is **musical analysis**, through which one may uncover both the composer’s intentions and technical strategies, the internal relationships among components, as well as the function of each within the sonorous dramaturgy of the whole. Through this process, both **cognitive and aesthetic intelligence** are developed, refining musical taste and sensitivity to stylistic and semantic subtleties, and thereby enhancing the capacity for a conscious and profound appreciation of musical quality, as well as for a clear distinction between artistic value and non-value.

For this reason, Musical analysis, as a discipline of synthesis, may assume an essential role in both the intellectual and emotional perception of a musical experience capable of enriching and elevating the human spirit.

The Neurocognitive Foundation of Musical Thinking (Cartographic Mapping)

Performed music, lived in real time as an integrated sensory experience, has an implicit characteristic: beyond its sonorous dimension, it is also inherently visual, as clearly noted by Igor Stravinsky in *Poetics of Music* (Stravinsky, 1967, pp. 101–102). From the appearance of the performer to the organization of the acoustic space, from the gestures of musicians on stage in purely instrumental concerts to the staging of opera and ballet performances or contemporary multimedia experiences, musical perception generates a complex, syncretic experience.

Nevertheless, the phenomenon of reception through audio recordings, although significantly deprived of immediate visual coordinates and of the collective energy that fulfills meaning (and thus the very purpose of music), can still generate a multisensory perceptual process through the activation of memory, imagination, and already internalized perceptual schemas. As the British scholar Susan Hallam, a specialist in music psychology, observes: “When we listen to music, we rapidly and often unconsciously interpret a vast amount of information” (Hallam, 2019, p. 21). At an initial stage of engaging with a recording, Nicholas Cook argues that the listener does not perceive sound alone, but imagines the gesture that produced it; although the performer is not seen, the sound itself contains traces of the body – through breath, articulation, and other elements: “This applies even in phonographic listening: the signs of the body are encoded in sound and mapped by listeners onto their own bodies, resulting in a musical experience that is not only auditory but also visual, kinesthetic, and social” (Cook, Tiplea-Temeș, 2017, pp. 11–12).

This phenomenon thus constitutes the initial stage in the activation of brain activity during musical reception, in which a simple auditory stimulus already triggers processes of integration, association, and even anticipation, developing in proportion to the extent of one’s engagement with music (through listening, specialized reading, and related practices). The more complex the music, the more these processes stimulate increasingly sophisticated neural mechanisms of thought. The “good news”, as Hallam also notes, is that “there are only minor differences in the processing of music between those with specialized training and those without formal studies” (Hallam, 2019, p. 22).

In order to understand this more fully, it is necessary to penetrate the inner workings of this phenomenon. Although music unfolds in time as a succession of sonorous events, it is, as we know, realized through a complex synchronization of constitutive parameters. A single moment within a musical composition involves pitch, duration, harmonic color, intensity, and timbre, and only a few such configurations can generate relationships that convey velocity, a certain pulsation, contextual positioning (types of textures), and can give rise to typologies of sonorous dramaturgy (with consequences for form and genre) or systems of pitch organization. A cultivated musical thinking will further incorporate the contextual function of each structure. Moreover, in the case of programmatic music or music with text, the sonorous landscape demands an exceptionally distributed attention.

This superposition gives rise, at the neurocognitive level, to a continuous process of selection and organization of information. The brain does not process each element in isolation; rather, it activates instantaneous mechanisms of pattern recognition and integration into meaningful contexts, drawing upon memory and anticipation.

In practical terms, this process is so complex that it cannot be localized within a single brain region. As musician and cognitive neuroscience expert Daniel J. Levitin argues: "Musical activity involves nearly every region of the brain and nearly every neural subsystem" (Levitin, 2010, p. 99).

The **human brain** is composed of **two hemispheres** or, as the renowned educator Makoto Shichida describes them, "two different 'computers' operate within the brain... the left hemisphere is also referred to as the linguistic brain, while the right hemisphere – the imagistic brain" (Shichida, 2022, p. 89). The left hemisphere fulfills a conscious function, operating through a slower, analytical, and reason-based process grounded in logic and argumentation, and is also associated with communication (written, oral, or gestural). In contrast, the right hemisphere operates through a rapid, automatic, and synthetic process, based on intuition and the functions of the subconscious, being responsible for spatial awareness.

Although the left hemisphere is generally considered responsible for mathematical thinking and the right for the artistic domain, the observation made by the aforementioned author is particularly striking: "I once examined, using a PET scan, the brain activity of a music teacher while listening to classical music. I discovered that 80% of teachers listen to music using the left hemisphere" (Shichida, 2022, p. 92)¹

In this case, the explanation is related to the type of auditory ability (perfect or relative pitch) of the listener; however, our interest lies in the manner in which musical thinking migrates from one hemisphere to the other, as well as in their synchronization during activities involving musical processes. If we examine this more closely, from a strictly musical perspective, the left hemisphere processes structure, rhythm, and analysis; it is involved in the logical organization of music and supports pattern recognition (thus relating to musical thinking). The right hemisphere, on the other hand, processes pitch inflection, timbre, expressivity, and melodic contour, providing a global perception and aesthetic experience (thus relating to sonorous consciousness). In other words, the interaction between the two hemispheres allows for the integration of sonorous elements into a complete and coherent experience, in which analysis and aesthetic perception function complementarily.

Therefore, **musical activities** trigger an **integrated bilateral process** that can be

¹ The advanced stage reached by modern medicine provides scientific validation of the processes involved in the perception and integration of music, not only through electroencephalography (EEG), but also through techniques such as positron emission tomography (PET) and functional magnetic resonance imaging (fMRI).

associated with “the grounding of a neuro-perception, a neuro-aesthetics, and a neuro-semiology of music” (AthanasIU, 2003, p. 29).

Moving further into depth, each hemisphere is divided into four main lobes: frontal, parietal, temporal, and occipital.

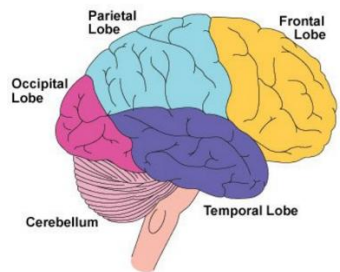


Fig. 1 The Anatomy of the Human Brain

Although generalizations can be made, the functional complexity of the brain’s lobes can neither be fully encompassed nor reduced to rigid cartographic mappings. Nevertheless, several broad directions may be outlined.

LOBE	GENERAL FUNCTIONS	MUSICAL FUNCTIONS
Frontal	Planning, organization, decision-making, movement, speech	Musical analysis, understanding armonic functions, phrasing
Temporal	Short-term memory, hearing	Pitch perception and timbre, interval recognition, identification of melodic contour
Parietal	Object recognition, spatial perception, information processing, interpretation of tactile sensations and pain, comprehension of spoken language	Awareness of sonorous textural planes and types of musical writing
Occipital	Visual information processing	Score reading, correlation of notation with the resulting sonority, visual representations of structural patterns

Fig. 2 Functions of the Brain Lobes

Although an attempt has been made to outline, in parallel, the musical functions fulfilled by the lobes of the human brain (Levitin, 2010, pp. 98–100), **most musical parameters**, such as melody, rhythm, harmony, or form, cannot be assigned to isolated regions, but instead **simultaneously engage multiple cognitive, auditory, and mnemonic processes**, integrated within a unified system.

Certainly, a specialized study of brain anatomy would further enrich this fascinating and not yet fully defined domain of neuroscience with numerous details. Nevertheless, it becomes almost axiomatic that interaction with music, from any perspective, results in a complex cerebral activity that stimulates and gives rise to musical thinking as a higher-order process of awareness and understanding of sonorous reality. The more elaborate the musical structures, the more intensively the cognitive mechanisms involved are engaged. Thus, **musical complexity** may become a **factor of neuronal stimulation**, and consequently of cognitive development, with an implicit effect on the enhancement of intellectual capacity, **refining aesthetic sensitivity** and cultivating a taste for expressive subtleties.

Musical Analysis – the “Synapse” Between Musical Thinking and Sonorous Consciousness (Radiographic Probing)

Following the stage of musical perception, the **process of understanding** begins **through analysis** and through the establishment of connections between constitutive elements. The awareness of a musical composition is achieved through a meticulous process of decomposition, recognition of its components, and the reconstruction of the universe shaped by the creator. At this point begins the higher stage beyond merely “hearing,” which transforms into active “listening” and, subsequently, into “understanding” the mechanisms through which the sonorous organism comes to life. The consequences of this process include the validation or invalidation of the work as an artistic value, its assumption as an aesthetic experience, its assimilation as a trigger for states and emotions, and its direct impact upon the individual at all levels of being.

By its very nature as a synthetic discipline (one that can only be practiced through the correlation of other specialized fields), musical analysis transcends its condition as a purely technical endeavor concerned with the investigation of patterns, schemes, systems, functions, syntaxes, or other formal “configurations.” It claims instead the role of **mediator between immediate perception**, sometimes sterile, often profane, **and the rational and aesthetic integration** of the sonorous phenomenon. Musical analysis, now understood as a higher form of consciousness, assumes the role of a “synapse,” transferring and transforming musical information from the intuitive substratum into that of a meta-conceptual framework capable of generating meaning, coherence, and authentic artistic value.

In order to better understand the extent to which the brain is stimulated through

the process of musical analysis, it becomes necessary to explore its nature as a complex act of knowledge and as a conversion of its meanings into axiological landmarks.

Defined by the musicologist Clemansa Liliana Firca as **"the primary modality of studying the musical work** and compositional art in general" (Firca, 1973, p. 12), musical analysis, although initially involving a dissociative process, ultimately targets the ontological nature of the musical phenomenon. As she further argues, "the contribution of the analyst to the unveiling of the identity of a score, a style, etc., is not measured by the meticulous presentation of stages of formal construction, nor by the exhaustive treatment of morphological categories, but by the capacity to discern either the single principle or the group of principles that structurally and semantically individualize the phenomenon" (Firca, 1973, p. 15). This is because the systematic application of a single, generalized analytical scheme to all scores may fail precisely by missing the very essence of the sonorous identity and its intended trajectory, as conceived by its creator: "there have been cases, however, in which surpassing the pre-established analytical scheme, by engaging all capacities of intuition and professional culture (historical, aesthetic, etc.), and especially the synthesizing abilities of the researcher, has led to genuine access to the being of the work" (Firca, 1973, p. 13). We thus understand that advanced analytical practice **engages and mobilizes all the endowments and cognitive resources** available to the human being.

The complexity and multidimensional demands of the musical phenomenon are further illustrated by the compelling perspective of the composer Irinel Anghel, who compares musical creation to a biosystem, investigating its ontogenetic nature starting from **"the hypothesis of the existence of a 'musical DNA'**, in which the miniature genetic code is inscribed, the developmental program of the sonorous organism, the duration of its life, namely musical time, and, in one way or another, the means of activating it" (Anghel, 1993, p. 49). Within this framework, the author advances the idea of **"the existence of three fundamental levels of material reality:** the physical, the biological, and the psychological [...]. The applicability of the triad matter–energy–information in the domain of musical creation is evident through the consubstantial relationship, within the very intimacy of a sonorous object, between its form, its integrated content, and the meaning conveyed by that content" (Anghel, 1993, p. 51).

A higher stage of the radiographic probing of the sonorous world is also articulated by the musicologist Laura Vasiliu: "musical phenomenology, absorbing ideas from *Gestalt* psychology, places at the **forefront perception and the lived experience of the musical phenomenon as it unfolds**, extrapolating the dynamic, kinetic, and temporal character of the art of sound" (Vasiliu, 2002, p. 18). Within analysis, multiple layers emerge: form and structure, each subdividing and generating the other parameters of sonorous dramaturgy. As a fundamental component in the decoding of a score, musical form is also defined, from a phenomenological perspective, as a "complex mental

configuration, born during and as a result of listening to a work, as a consequence of the transformation of musical temporality into visual-spatial suggestion" (Vasiliu, 2007, p. 27).

Thus, through analysis, music no longer remains merely at the level of reception, but is deconstructed and subsequently reconstructed at the mental level. This reconstruction allows access to the intimate mechanisms of the sonorous discourse, to its internal logic, to the intentionality of the creative act, and to the fulfillment of its trajectory within the sensitivity of the listener. In this sense, analysis becomes not only a solid instrument of knowledge, but also an act of higher consciousness, through which the listener transcends immediate experience and penetrates the most subtle substrata of music, assuming it as a reflected and internalized aesthetic experience, and opening the way to profound cognitive processes.

From this point onward, it becomes evident that musical analysis surpasses the descriptive and structural level of sonorous events within a score and takes shape as an act of cognitive internalization and affective interiorization. Beyond functions, relations, syntaxes, morphologies, and typologies, higher types of awareness emerge, in which music reorganizes itself as a profound experience, simultaneously lived and understood.

In other words, once the human being is penetrated by such a complex phenomenon, one may allow oneself to be carried toward the highest and most noble purpose: that of assuming the role of sonorous consciousness itself, profound, reflexive, and consciously internalized. Thus, this sonorous consciousness becomes an act **of aesthetic experience, intensified through understanding.**

On Meaning and Fundamental Calling in the Destiny of the Musical Work: Its Fulfillment in Sonorous Consciousness (Holographic Revealing)

Synthesizing the entire preceding inquiry, we may define, in scientific terms, the trajectory from the initial perception of music to its final destination, consciousness, as follows: "networks of interconnected neurons perform computations on information and combine their computations in ways that lead to thoughts, decisions, perceptions, and, ultimately, to consciousness" (Levitin, 2010, p. 97). The author further investigates the subject and advances a particularly compelling idea: "perhaps the supreme illusion in music is that of structure and form. [...] Our ability to derive meaning from music depends on experience and on neural structures that can learn and modify themselves with each new musical work and with each new listening of a familiar one" (Levitin, 2010, p. 124).

We may thus infer a virtuous circle: the more we listen, the more we understand; the more we understand, the more refined our taste becomes; the more refined our taste becomes, the more deeply we feel, ultimately leading to a process of selection and **axiological discernment**. From the perspective of ancient thought, this consequence may be extended even further: "For instance, Aristotle maintained that listening to music

contributes substantially to the cultivation of the mind and to the development of moral judgment" (Balteş, 2012, p. 33).

As a beneficial collateral effect, there also emerges an epiphenomenon: **the cognitive and psycho-emotional training** involved in the musical phenomenon **develops** not only **neural capacities** transferable to other domains, but also the **sensitivity and empathy of the human being**. This is because music is likely a second nature of humankind, as the British neurologist Oliver Sacks affirms: "Sensitivity to music appears very early in development, occupies an evident and central place in every culture, and probably emerged at the same time as our species" (Sacks, 2017, p. 7).

A revealing personal illustration of the force with which the sonorous universe operates as a form of both pre-linguistic and meta-linguistic communication can be found in the naturalness and spontaneity of childhood. When he was about four or five years old, my son asked his father, who was listening, in a moment of relaxation, to Greek music, what kind of music it was and why he could not understand it. His father explained that it was music in another language, to which the child responded, with disarming simplicity: "Daddy, play some music in Romanian that I can understand, play some Mozart!" For a child, instrumental music composed by Mozart was a language he could understand.

Beyond its apparent naivety, this reaction reveals **the existence of a form of proto-sonorous consciousness**, in which music is not perceived as a foreign language, but as a space that generates meaning. "We are a musical species to the same extent that we are a linguistic one" (Sacks, 2017, p. 9). Far from contradicting the objective of the present research, we may deduce that understanding can transcend explicit semantic codes and may construct its edifice upon **perceptual and affective structures pre-existing within human consciousness**, thus confirming, despite its often clichéd status, the postulate that music functions as a universal language, whose comprehension is revealed through the manner in which the sum of intuitive elements of human nature, and subsequently of experience, is reflected within our consciousness.

Thus, the concept of **sonorous consciousness** reveals a **duality of meanings**: on the one hand, it manifests as an **original stage** inherent to human nature; on the other, it takes shape as a **cultivated capacity**, enhanced through knowledge, practice, and aesthetic refinement, elements through which we recognize and resonate with artistic value, and through which we mirror the very essence of the human condition. This is further supported by recent studies: "The emotional processing of music emerges early in development. From 2 to 4 months, infants show a preference for pleasant, consonant music and distress in response to unpleasant, dissonant music" (Balteş, 2012, p. 69).

In order to **"holographically reveal"** the **sonorous entity** in its fullness, we must return to the fundamental purpose of the musical work: that of generating **aesthetic meaning** (a notion that also encompasses spiritual meaning), reflected in the artistic

sensibility with which the rational human being has been endowed: "From Pythagorean numerology and the Platonic harmony of the spheres to Aristotelian mimesis and catharsis, or Schopenhauerian essentialism, music has thus existed under the 'gaze' of the aesthetic, emerging also through the exercise of its principles. [...] The axiological vocation of music depends on the weight of this component" (Dănceanu, 2003, p. 206).

Within this perspective, the destiny of the musical work does not exhaust itself in the act of creation or in immediate reception, but is fulfilled through a mode of existence marked by the consciousness of the one who assimilates it: "Beyond its circumstantial birth, music has the right to attain a perennial existence" (Dănceanu, 2003, p. 228).

Thus, through sonorous consciousness, music no longer remains merely a beautiful, intriguing, or provocative phenomenon to be perceived (for various purposes) and understood, but becomes the mirror in which the spirit recognizes and rediscovers itself in the purest, most subtle, and most profound form of its own essence.

Conclusions

The aim of the present article is to highlight the role of musical analysis in the development of the cognitive processes involved in musical thinking, as well as its impact on the formation of an expanded intellectual capacity, applicable not only to a profound understanding of the musical phenomenon, but also to other domains of human experience. It also seeks to foster an awareness of the irreducible value of music, in an ineffable sense.

In conclusion, musical analysis, as a fundamental approach to music, transcends its purely methodological function and becomes an instrument for the configuration and shaping of both thought and consciousness. It thus contributes to the development of a higher form of intelligence, both cognitive and emotional, capable of integrating the musical experience, revelatory for the human being, into a dimension rich in meaning, reflection, and knowledge, as a true sonorous epiphany.

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