Sound World: the Design of Musical Thinking

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Introduction

A fertile union is undoubtedly that of philosophy and music. The experiences that are being carried out in conservatories and universities are oriented towards an analysis that starts from a fundamental datum: the perception of sounds in the various stages leading to the composition of a melody.
Studying and educating about sounds implies, for the musician, asking 'how and why' to explore the nature of the subjective perception of sound by opening up to philosophical analysis. The perceptual connections of the experiences of sounds and their future reworking and interpretation through thought are fundamental to an approach that not only influences the individual perceiver who will move on to sound-imagery, but also the completeness of the musical composition. Listening education represents one of the most delicate and most complex areas to deal with in the field of music education itself. Delicate because listening, in itself, is subjective; complex because it involves combinations of varied skills ranging from motor coordination to spatial-temporal conception. Knowing how to listen to - and thus "understand" - a piece of music means not only knowing how to recognize its components separately, but above all having the appropriate tools to identify all the combinations that contribute to producing the final, aural and emotional effect.[1] The latest orientations in listening education in the field of music education aim at a pedagogy that starts with listening to a musical work in its entirety, thus privileging the subjective aspect of listening, and then moves on to analyzing in increasing detail the individual compositional elements that form its very unity.

[1] C. Peyrot, *Ascoltare per comprendere*, Edizione Progetti Sonori, Mercatello sul Metauro ,Pesaro-Urbino, 2017 Learning to listen to sounds in and of themselves, free from any interpretative models or preconceptions, stimulates creativity. The text, the result of years of applied research and teaching experience in the field of musical ear training at the Conservatory of Music "G.F. Ghedini" in Cuneo and the Conservatory of Music "N. Paganini" in Genoa (Italy), presents educational workshop sheets on pieces from the musical repertoire that aim to develop not so much the technical aspects of listening in musicians, as might be the case in traditional teaching, but rather their subjectivity and empathy.

In this essay, you will find the text by Gabrielius Simas Sapiega, a lecturer at the Vilnius Conservatory of Music. The text, which is very interesting from a philosophical point of view, succeeds in exploring the idea that sound can be understood not only as a physical phenomenon, but as a mode of thought. Drawing from Platonic philosophy, it emphasizes unity as a central metaphysical principle, where the cosmos is seen as a living, self-generating whole. In this view, sound functions analogously: it contains internal micro-processes that reflect the structure of the whole. Musical composition, especially when treating sound as material unfolding in time, thus becomes a cognitive process—a design of thinking—in which the logic of unity emerges organically from within the sound itself.

The following essay by Fabio Ferrucci, a lecturer at the Conservatory "Arrigo Boito" of Parma, achieves completeness by highlighting how it is possible to practise a new international pedagogy that involves many people from different cultural backgrounds who aim to emphasise the importance of knowing how to listen. Knowing how to listen means achieving a better level of awareness of subjective actions by improving one's interaction with other human beings. The new pedagogy can show us how sound education is also an active and fundamental philosophical education; knowing how to decipher sound by analysing its perception and its possible relationships can direct the search for philosophy itself towards an awareness of the self. Without acquiring a keen sensitivity to listening that conveys the complexity of thought, human relationships would be sterile and lacking in empathy. We must not forget that the word itself is a set of complex sounds that must be plumbed analytically in order to make a complete psycho-physical synthesis.

The Aspect of Unity in Plato's Philosophy

by Gabrielius Simas Sapiega

From an Aristotelian perspective, Plato's philosophy is often associated with dualism. However, according to philosopher Naglis Kardelis, this expression is inaccurate and does not properly describe Platonic philosophy – rather, it is "a term of modern epistemological nomenclature" (Kardelis 2007: 58–59)[2]. As previously noted, Aristotle criticized the theory of *eidos* for exhibiting certain dualistic notions – a doubling of reality. Such assumptions likely arose when Platonic philosophy came to be centrally interpreted through the theory of *eidos* rather than the concept of unity itself. The *eidos* is a derivative theory, used to explain unity itself.

Even in Aristotle's insights, *eidos* is attributed a connecting function between the motionless, static limit (*peras*) and the undefined, boundless (*apeiron*). Here, a clear allusion to Pythagorean ideas is evident, though *eidos* itself is an authentic insight of Plato. The influences are quite apparent: the Pythagoreans with their 1:2 ratio, the unit as oneness and static being – Parmenides, the dyad as multiplicity and change – Heraclitus, the notion of *homoiomeres* (like-parts) introduced by Aristotle, representing the presence of the whole in the part, and the divisibility of all things while maintaining qualitative variety – Anaxagoras; *eidos* may also have been influenced by Socrates and his theory of general concepts.

For this reason, it is crucial to engage with the sharp and authentic research of Naglis Kardelis and summarize the question of unity in the context of Platonic philosophy. Kardelis emphasized the noticeable influence of Anaxagoras in forming the theory of organic unity, which can later be connected to the musical concepts developed by spectralists.

[2] *Kardelis, N. „Vienovės įžvalga Platono filosofijoje". Versus aureus: Vilnius, 2007.*

To better understand Plato's symbol of unity, one should turn to the cosmic creature portrayed in the famous *Timaeus* myth – that is, the symbol of the Whole. Undoubtedly, the symbol of the cosmic animal was and still is considered the central text of Plato, representing all of his philosophical ideas. This symbol is employed not only for greater clarity but also as an analogy for the ideas of spectral music composers, who assert that sound is a living organism containing self-generating microprocesses within itself.

Thus, this being is depicted as a living organism, to which no mechanical parts are assigned: it is a "single and perfect living creature, composed of perfect parts" (*Tim.* 32c–d)[3]; the demiurge "constructed the cosmos as a unified whole, composed in turn of unified parts – perfect, ageless, and free from disease" (*Tim.* 33a–b), and "the body of the cosmos... smooth, uniform everywhere, equally extended from the center in all directions, whole, perfect, and composed of perfect bodies" (*Tim.* 34b). The demiurge "shaped the cosmos into a sphere by spinning it" (*Tim.* 33b). One of the most important insights – reminiscent of self-generation – is that the cosmos is *homeostatic*: it was created "so that it would receive nourishment from its own decay, performing all actions and experiences by itself and within itself" (*Tim.* 33c). The cosmos lacks nothing else; it is self-sufficient and self-satisfied.

As we can see, the body of the cosmos is composed of two elements that represent opposites: fire and earth. These two elements require an additional–connecting–element to unite them: air and water. All elements are interconnected through *proportion* (*Tim.* 31c). For the unity of the cosmos' body, the gaps between opposites are governed by proportional relationships (*Tim.* 32b), "so that not only the elements themselves but also the numbers determining the relationships among them would form a unity" (*Tim.* 32a; Kardelis 2007: 54).

In order to preserve the unity of the Whole, at its center lies the Soul of the Whole—the outer wrapping (*Tim.* 34b), whose unity is identical to that of the body: the natures of sameness (*tauton*) and difference (*thateron*) are linked through *ousia* (*Tim.* 35a). Sameness in the soul signifies unity, and difference signifies multiplicity, which can be expressed through a 1:2 ratio. Here, 1 is unity, and 2 is multiplicity.

The myth notes that the demiurge "combined them all into a unified idea, forcibly compelling the nature of difference—which resists mixing—to unite with the nature of sameness, blending them with substance (*ousia*) and making from the three a single whole; he then divided this whole into the necessary number of parts, each being a mixture of sameness, difference, and substance" (*Timaeus* 35a–b). The phrase "forcibly compelling" in the quotation reveals that the unification of opposites requires force. According to Naglis Kardelis, it is important to note that "each particle of the soul's mixture, in turn, reflects the whole" (Kardelis 2007: 55) – an organic mixture of sameness, difference, and substance.

Following the references in *Timaeus*, mind arises within the soul, and the soul resides within the body. This means that this living being consists of three organically connected parts: body (the instance of difference – multiplicity), soul (the connection – the organism's unity, the instance of life and movement), and mind (the instance of sameness – unity). All of these parts, both collectively and individually, are ternary, reflecting the structure of the whole—with the exception of mind, which is pure sameness in nature.

Similar ternary proportions are used in other Platonic descriptions (such as in the *Phaedrus*, just as in *Timaeus*) to portray the structure of the human being – body, soul, and mind. Here also emerge Aristotle's own attestations that when uniting two opposites, the *eidos* (idea) is employed: it appears

[3] *Platonas. Timajas. Kritijas. Aidai: Vilnius, 1995*

as the connecting element between the unit (*monas*) and the dyad (*duas*). Thus, *eidos* is identified with the representation of unity.

Undeniably, just as the cosmos and the human being are depicted in Platonic philosophy, so too is the State – a unified organism, akin to a mathematical fractal analogy, which mirrors the Whole. Therefore, Platonic philosophy is not an expression of dualism, but a philosophy of unity – an organic unity through the communion of two differences.

Hylomorphic Projections in the Art of Sound: Theoretical Insights into Matter and Form

In this subsection, after refining the concepts of matter and form from a philosophical perspective, possible hylomorphic insights are introduced within spectral composition – specifically in music that treats sound as matter. It considers matter and form as substance, and explores strategies of their dissemination through time in the musical score. Based on conclusions drawn in subsection 1.1, an assumption is made that such a phenomenon can be identified with the fractal presentation of Plato's organicist theory. This research angle enables the author to apply the principle of fractality as an analogy: where the smallest part preserves – precisely or approximately – the information of the whole, and the sonic expression of the spectrum in the score represents these ideas.

This perspective on the unfolding and generativity of musical material within a composition allows for the demonstration of the organic nature of the compositional process and its internal elements: although the individual elements are discrete, they contain within themselves the information of the whole, thereby enabling various potential combinations, interactions, and similarities – such as when pitches are organized according to the timbral properties of sound, and elements are developed in ways that directly or indirectly reflect the spectrum, and so on.

Another equally important aspect of the study is the unfolding of matter and form in time, particularly in relation to spectral composition. This perspective arises from a very fundamental premise: that for substance and its inherent capacity to manifest to be meaningfully explored in subsequent subsections – particularly in justifying the external relationships of spectra and their correlations – space and time (as grounds and segments) are essential. Thus, space expresses the relationship between substances, while time expresses the relationship between determinations.

The Concept of Matter in Music

Matter in music is sound. In a narrow sense, sound is a physical phenomenon studied by a branch of physics known as acoustics. According to the definition by Harry F. Olson (1901–1982), sound is a variation in pressure, displacement of particles, or change in their velocity in space, produced by an elastic body. Simply put, sound is created in air during the motion of an elastic object and requires a conductor; thus, it can be produced by various vibrating bodies—such as a piano, the body of a violin, a speaker diaphragm, and so on. Sound can also be generated by inducing air vibration waves, as in the case of a siren, the human voice, or a trumpet.

Therefore, matter in music is sound as a physical phenomenon—it can be visualized through a spectrogram, represented through various mathematical calculations, and described as a sound wave. The most essential characteristics of musical sound are: **timbre**, **duration**, **pitch**, and **intensity**. Each of these features can be described using empirical and mathematical methods – for example, pitch corresponds to a specific frequency of vibrations per second.

The way sound resonates is determined not only by the elastic body or the resonator—that is, the material composition of the conductor—but also by the space in which the sound occurs.

Let us try to compare matter in music with Aristotle's broader concept of matter, which refers to the individual properties of things. In this case, the musical work is the *form*—a general, species-level property of a thing. As Aristotle puts it:

"When we say that one thing comes to be from another or from something different, we may refer either to something simple or to something complex. Let me explain. A man may become musical, or unmusicality may become musicality, or an unmusical man may become a musical man. I describe as simple the man and unmusicality (that which becomes), and musicality (that into which they become). When we say that an unmusical man becomes a musical man, both the subject of the becoming [the unmusical man] and that into which he becomes [the musical man] are complex entities. In some of these cases we say not only that this becomes, but also that this arises from that – for example, that musicality arises from unmusicality. But we do not say this in every case. We do not say that musicality arises from man, but that man becomes musical. Of the things which we call simple becoming subjects, one persists in the process of becoming, while the other does not. The man persists when he becomes musical, but unmusicality does not persist—neither by itself nor as a component." (*Physics* I.7.189b32)[4]

In this case, a musical work as *form* is not merely an abstract geometry, but rather a set of species-level properties—such as stylistics, the dissemination of musical language elements within compositional material, social networks, and so on – which are conditioned by space and time. Twentieth- and twenty-first-century music, especially electronic music, which has focused explicitly on sound as matter, provides a clear example of this. This movement was greatly propelled by the musical aesthetics formed at IRCAM and the related research in music acoustics, the development and dissemination of new sound analysis tools.

Observing these phenomena reveals an important insight – *ex nihilo* is not applicable here: this did not emerge from nothing. The renowned anthropologist Georgina Born (1955), in one of her interviews, states: "The skeuomorphic legacies of analog digital techniques are expressed in horizontal structures – that is, from left to right – based on the representation of time on the screen" (Born 2015: 142–143)[5]. Even in such rudimentary sound visualization platforms and research, we observe the crucial role of time in determining the species-specific characteristics of sound—broadly and narrowly speaking, its *form*.

Nevertheless, the matter of a musical work is that which is *not* form. As Aristotle puts it: "Essence – that is, substantial reality – has never been clearly expressed. It is mostly discussed by those who believe in forms; they did not expect that even more sensitive things might be contained within the forms. Unity is a question of form, of whether a source of movement exists in them (since they claim that forms are causes of immobility or stillness); thus, for them, form is the essence of everything, and unity is the essence of form." (*Metaphysics* 7: 9/149)

Accordingly, in this context, **matter – namely, sound – is constrained by its variable sonic properties and cannot be fully defined in a fixed manner**, as it is conditioned by external factors such as:
– the acoustical space in which it resonates,
– relative dynamics,
– the specific nature of the instrument,
– the different performance techniques used to produce the same sound,

[4] *Aristotelis. Metafizika. Internetinis šaltinis: http://www.documentacatholicaomnia.eu/03d/- 384_-322,_Aristoteles,_13_Metaphysics,_EN.pdf*
[5] *https://www.academia.edu/32321526/Temporalities_aesthetics_and_the_studio_An_interview_with_Georgina_Born_2016_*

– or even the same sound played on instruments of the same type but made from different materials or material compositions.

Thus, **sound can indeed be identified with matter**, but it also becomes evident that this matter is *not primary* – it contains within itself micro-elements and processes. The analysis of these internal processes allows for specific philosophical assumptions to be made.

If we treat an individual sound as *matter* that represents the dynamic transformations of a work's essence over time – new form clusters, the dissemination and (re)generation of constituent elements due to inner processes and their encoding –and ultimately, the **unity of those elements within the musical texture**, then the musical work, as conceived by **spectralist composers**, emerges as an *organic and unified reflection* of Platonic unity philosophy in the 21st century.

Connecting ears- connecting people

By Fabio Ferrucci

Far from being an activity for few gifted people, in the past European school tradition music was considered a core subject of every curriculum, one of the four disciplines in the *Quadrivium*: in the same way, we strongly believe that developing the ear is not only crucial in order to improve a musician's inner perception and memory, but in a wider perspective turns out to be a powerful tool to reach human harmony. For this reason, Conservatorio di Musica "Arrigo Boito" in Parma (Italy) in 2015 created the still-growing network "Sentiamoci a Parma[6]" in order to foster "soundly" and fruitful connections between human beings through

- gathering teachers and students from all over Europe and beyond in workshops focused on Ear training where teachers give "real" lessons on stage while people convene for mutual observation and discussion, thus promoting knowledge, tolerance, human and cultural enrichment
- encouraging teachers' mobility and exchange through Erasmus+ and other consortia in order to share good practices, widen perspectives, stimulate mankind's progress, turning fragmentation into fertile reciprocity.

In a 10-year span we connected more than 250 teachers and 700 students from 30 different countries, developing a deep awareness to be part of something crossing over our own classrooms. The benefits of this activity can be summarized as follows:

- Ear Training teachers too often have to deal with the same didactic issues: as a result, many of them reach similar solutions after spending a considerably long time in personal research without knowing each other at all: cooperation means knowledge.

- Now and then someone devises a revolutionary system, or creates original teaching materials, but seldom other colleagues get to know about it: not everyone is interested in publishing his own material and even if this happens, many publishers can only count on a very limited distribution for

[6] https://www.conservatorio.pr.it/sentiamoci-a-parma-2025-eartraining-workshop-forum-dal-9-al-12-aprile-2025/ https://www.conservatoriocatania.it/?portfolio=symposium-ear-training-in-progress-2024-ii-edizione

their books. Furthermore, not so often you find teachers struggling to spread their own “secrets”, with the result that ideas have very little chances of circulating: networking means progress.

- From time to time, colleagues found the solution to problems everyone has been experiencing for years. More than once their answers were so unbelievably simple that you might wonder why you hadn’t discovered them yourself. As it often happens, the more you focus on particular details, the more you lose sight of the general view: sharing means advancement.

- Teaching in a different environment forces you to adapt your work and use your strategies with a deeper level of awareness. In this way you have the chance of considering your methodology with totally new eyes and often to dramatically improve it: changing means improvement.

To sum up, enhancing the way we listen – in the broadest possible sense – means deepening the level of awareness of our actions and improving the way we interact with other human beings.

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Prof. Dr. Fabio **Ferrucci** (1969) works at Conservatorio “Arrigo Boito” in Parma (Italy) as Ear training professor, Head of Theory department, Referent for the recognition of qualifications, curricula and credits, Internal member of the Quality evaluation board. At the same institution he held the role of Students’ counsellor from 2012 to 2024 and Didactic coordinator from 2016 to 2022. He was awarded Piano, Choral music and choir conducting, Didactics, Electroacoustic music composition, Acoustics and piano tuning Conservatory diplomas and postgraduated *cum laude* in Philosophy at *Alma Mater* Bologna University. He wrote the book “L’arte della memoria di Giordano Bruno” about *De umbris idearum*. Winner of both editions of the “Leonardo da Vinci” prize provided by the Italian National Ministry for University and Research (MUR), he created and coordinates the Postgraduate Specialization Course in Theory, rhythm and musical perception - Ear training, the only one active in Italy.
He created and every year organizes the International Ear training workshop: *Sentiamoci a Parma - connecting ears!*, leading to the birth of the widest network in this sector. He is regularely invited as a speaker in the most relevant events in this sector (HarMA, Nordisk gehørpedagogisk konferanse, GMTH-Kongresses, Escola de Outono...). Since 2023 he organizes the annual Symposium “Ear training in progress” at Conservatorio di Musica “Vincenzo Bellini” in Catania (Italy). He is also guest professor at Tianjin East High School of Arts (China) and PhD supervisor.

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