

Oniontology: Realities, Communication, Semiotics, and Embodiment of Music

Before we embark on the detailed investigation of musical creativity, we should ask about the localization of such creation: Where are those works which composers and improvisers are generating? And also: Where are the generative processes and gestures located, and is there an option to view all these objects and activities in a big existential topography?

To answer this complex questionnaire, we want to prepend the technically detailed discussion with a complete picture of musical existentiality: where music exists and how it comes into being. Musical *ontology* is precisely the philosophy and field of knowledge that deals with these questions. This approach will give us the necessary conceptual architecture to unfold a presentation of the subject that comprises all relevant perspectives and that enables us to interconnect them in the framework of a unified understanding of music.

We shall now describe the general setup of musical ontology. Although general musical ontology has been described in a concise way in [85], in [82], and in [89], we want to recapitulate it here for the sake of a self-contained text, and also to stress certain aspects to be more adapted to the topic of creativity.

Let us start with what we have coined musical *oniontology*. It is the classical musical ontology that was introduced in [72], comprising the dimensions of realities, communication, and semiotics, but now enriched by a fourth dimension, embodiment. Since this fourth dimension splits into three layers, the classical ontology is given a triple-layered structure, hence the somewhat fancy name of an “oniontology” (see Figure 2.5).

This oniontology presents a topographic landscape of musical ontology: It is a geographic display of localities determined by coordinates as specified from the four dimensions of ontology. In other words, musical oniontology is a conceptual space on which phenomena of musical existence are distributed. This spatial display enables us to understand creativity as a dynamic process that retrieves its contextual data from the oniontological landscape. So let us present all the dimensions of musical oniontology.

2.1 Realities

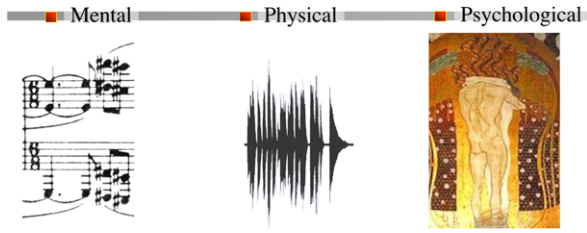


Fig. 2.1. The three fundamental realities of music.

This dimension describes the three fundamental values of reality involved in music: physical reality, psychological reality, and mental or symbolic reality (see Figure 2.1). So, acoustical phenomena relate to physics, emotional effects to psychology, and symbolic structures, e.g. mathematical descriptions in music theory, to the mental reality. Observe that the mental reality is not conceived as being a part of the psychological one, since mathematical reality (for example) is independent of our human psyche.

Differentiation of realities is crucial for avoiding widespread misunderstandings about the nature of musical facts. For example, the retrograde of a melody is a clear mathematical fact in the mental reality, but its reality in the psychological understanding of a listener is mostly inexistent: You probably cannot recognize the retrograde of a melody when hearing it.¹

Methodologically, there is no reason nor is it ontologically possible to reduce one reality to others. For example, it is a logically vicious circle to try to reduce mental reality to physical reality, as happens in fashionable neuroscience. In fact, explaining mathematical thoughts by neuroscience would mean describing them by chemical and physical processes. But their description would enforce quantum mechanics of chemistry and other basic theories of physical processes. Such descriptions, however, would be based on the complex mathematics of quantum mechanics and therefore generate a vicious circle: explaining maths by maths.

¹ A more complex example of this problem is Fourier's theorem, roughly stating that every periodic function is a unique sum of sinusoidal components, but see section 21.1.3 for a precise discussion. Its a priori status is a mental one, a theorem of pure mathematics. In musical acoustics, it is often claimed that—according to Fourier's theorem—a sound “is” composed of “pure” sinusoidal partials. However, there is no physical law to support this claim. Without a specific link to physics, Fourier's statement is just one of an infinity of mathematically equivalent orthonormal decompositions based on “pure” functions of completely general character. To give the claim a physical status, it would be necessary to refer to a concrete dynamical system, such as the cochlea of the inner ear, which is physically sensitive to the first seven partials in Fourier's sense.

The problem is rather to describe the *transformation rules* from the manifestation of a phenomenon in one reality to its correspondences within the others. To be clear, a neurophysiological transformation (“explanation”) of a psychological phenomenon does not, however, conserve the psychological ontology of the phenomenon. The specific phenomenon within the psychological realm *corresponds* to another phenomenon within the physiological realm. But ontologically, the phenomena do not collapse.

2.2 Communication

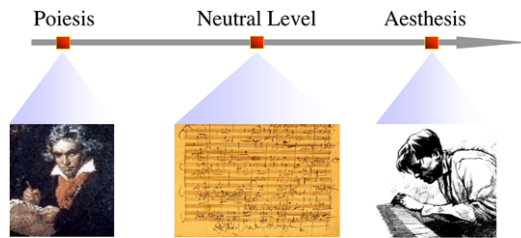


Fig. 2.2. The three stages of communication in music.

Following the famous scheme of Jean Molino and Paul Valéry [72], music deals with communication from the first value, the poietic position of the composer or creator, to the creator’s work, which is the material essence and output of the second value, called *neutral level* by Molino (see Figure 2.2). Communication, as encoded in the work, targets the third value: the aesthesis position of the listener, the addressee of the composer’s message. Valéry coined the word “aesthesis” to differentiate it from the aesthetic understanding. Aesthesis means perception and can be acoustical, psychological, or analytical, and it needs not relate to aesthetical evaluation. The aesthesis instance could even be computer software that takes a MIDI file as input and processes an analytical task thereof.

2.3 Semiotics

This axis (Figure 2.3) comprises all sign-theoretic aspects of music. It is articulated in the three classical constituents of a sign: expression, content, and signification. Expression, the first value on this axis, relates to the surface of a sign, something that stands for the sign’s *meaning* or *content*. The latter, content, is the second value—the “aliquo” in the classical definition “aliquid stat pro aliquo” (“something stands for something else”) of a sign. The third value is the signification part of a sign. It refers to the middle word “stat pro” of the

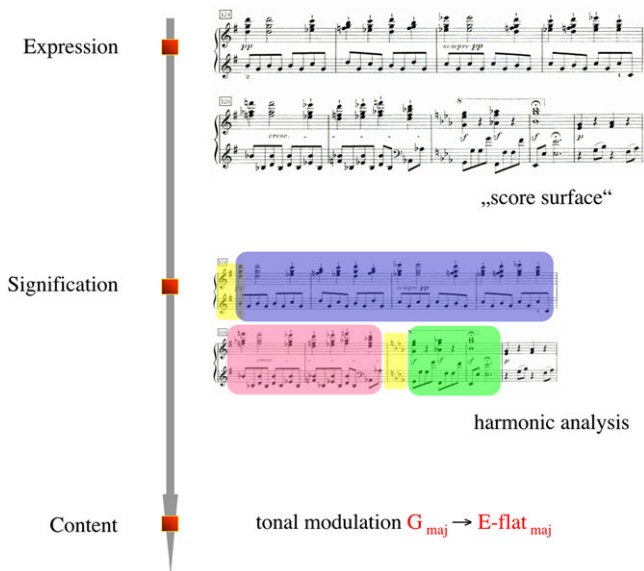


Fig. 2.3. The three positions in musical semiotics.

classical definition and explains the way or process engaged for the transfer of the surface value of expression to the “hidden” value of content. For example, when reading the musical expression for a fermata, the reader must invoke a complex machinery to understand the expression, i.e. produce the symbol’s content. In a semiotic system, there are three main structural aspects: The pointer from expression to content is called *semantics*; the connection between different signs, such as is built in sentences of a language, is called *syntagm*; and the mechanisms of signification applied by the user of the semiotics is called *pragmatics*.

The classical three-dimensional cube of musical topography is shown in Figure 2.4.

2.4 Embodiment

The very making of art is a level that is not articulated in that three-dimensional cube of musical ontology. Not one of its twenty-seven ($3 \times 3 \times 3$) positions grasps the gestural aspect of *making* art (and science). The cube, strictly speaking, only deals with the ontology of facts, of “what is the case” in Ludwig Wittgenstein’s sense [127]. It does not include the processual level of ontology.

Formally speaking, processes are the diagrams of spaces and transformations that describe the interaction of components of a complex system. We have to differentiate between processes and their products, the output of pro-

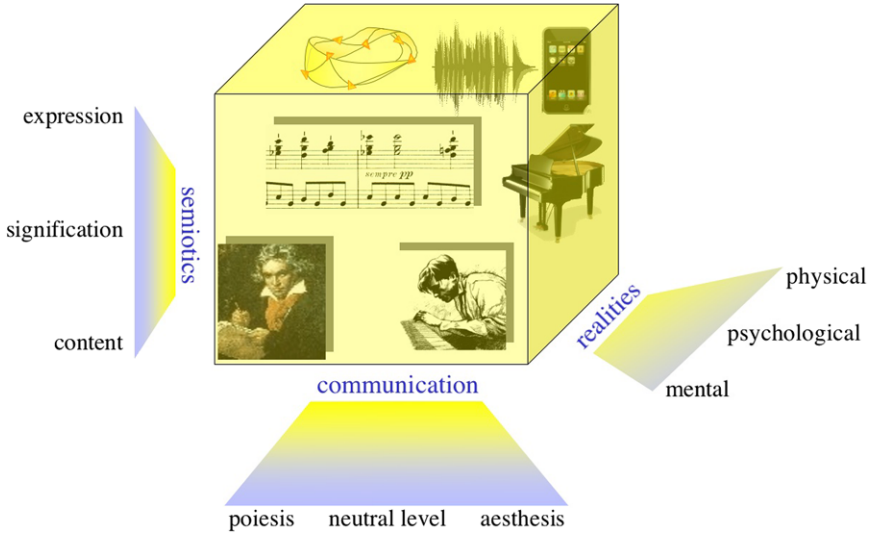


Fig. 2.4. The classical three-dimensional cube of musical ontology.

cessual dynamics. Processes are a kind of factory for facts, but not the facts themselves. The processual level is fundamentally different from its output products. Processes and facts are instances of different ontologies.

Going still farther in the initiated direction, processes are also an abstraction from a more basic layer—namely, the gestural layer—where all processes and their facts are initiated. Processes are disembodied gestures, reduced to their referential system of transformations.

This means that a new dimension must be added to the cube of musical ontology. This fourth dimension is called *dimension of embodiment*. Its three values are: facts, processes, and gestures. They deal with, respectively, these activities: “what is the case,” “to refer to,” and “to make.” In this scheme, the transition from gesture to process is dominated by disembodiment and schematization, whereas the transition from process to facts is dominated by evaluation and dissection (from the relating transformations).

Together with the previous three-dimensional cube of ontology, this fourth dimension creates a four-dimensional cube, which we call the hypercube of musical onontology. It takes the form of a three-layered onion of gestural, processual, and factual levels of ontology, as shown in Figure 2.5.

2.5 The Baboushka Principle

The above dimensions do not mean that musical ontology is indecomposably inscribed in such coordinates. It mostly happens that the $3 \times 3 \times 3$ coordinates are themselves encapsulated subsystems of the same nature. This

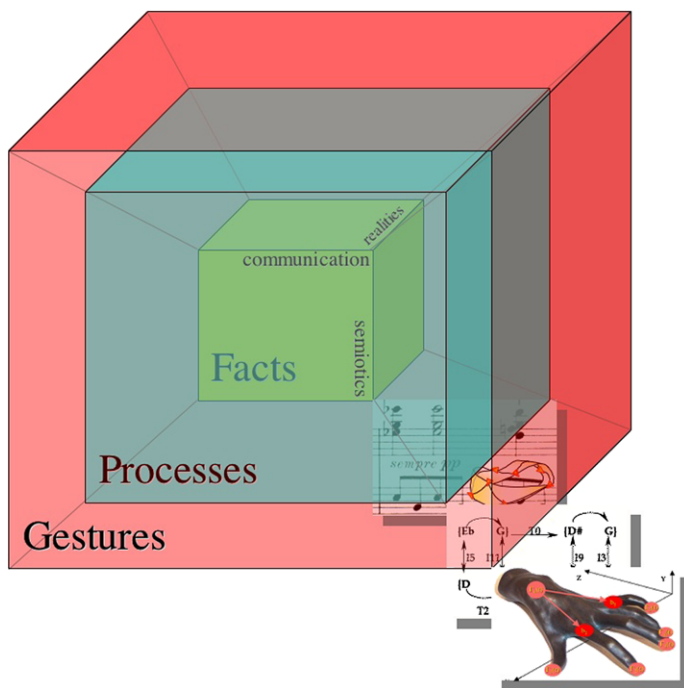


Fig. 2.5. The hypercube of musical ontology defined by the fourth dimension of embodiment. The graphics illustrate facts (the Möbius strip as a configuration of tonal degrees), processes (a diagram from Lewin’s transformational theory), and gestures (a model of the pianist’s hand).

reiteration of the hypercube’s structure is called the Baboushka principle. It does not mean that new dimensions are generated, but that each position in the hypercube can recursively be the compact representation of still a finer hypercube of the same type. Let us make this clear on the two examples of semiotics and communication.

In the semiotic dimension, it is a classical result from Louis Hjelmslev’s investigations [52] that the expressive surface of a semiotic system may be a semiotic system in its own. This is the case, for example, in so-called double articulation in language. Here, the words—expressions of the language sign system—are also signs with a graphical expression—the written level of alphabetization—that signifies its acoustical content. This level or semiotic ramification within the expressive level of the top system is called *connotation*. If, on the other end, the content level is itself a semiotic system, the comprising system is called a *metasystem*. And if the middle layer of signification is a semiotic system, the comprising system is called a *motivated semiotics*. It can be shown that music is built from a repeated imbrication of connotative subsystems [76, 77].

In the dimension of musical communication, the overall poietic position may be seen (and this was our example above) as articulated in composer, work (score), and interpreter, whereas this entire communicative unit is the poiesis that generates the neutral level of a performed work (on the acoustical level, say, when the performance is taking place in a concert), which in turn reaches the aesthetic level of the audience.

We leave it to the reader to imagine such Baboushka configurations for the dimensions of realities or embodiment. Hint: Think of the physical reality of a symbol, the symbolic representation of a physical sound, the facticity of a gesture, or the processual scheme underlying a gestural utterance, etc.

Musical Creativity

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