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

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.