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# THE AUDIBLE

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## Towards a Semiotics of the Audible

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In the following contribution I will propose a semiotics of the audible as the background, rooted in perception, of a semiotics of the music. My aim is to provide a theoretical framework as general as possible, and thus —of course — approximate and sketchy, by introducing a set of notions that are intended to fulfill the minimal requirements for a definition of the audible domain from a semiotic point of view. I will also advance some methodological hypotheses concerning the description of both listening and sound, based on a semiotic interpretation of Pierre Schaeffer's proposals. Indeed, the whole plan may sound too ambitious, as it would require a much longer discussion than the following. In this sense, the contribution may be read as a sort of manifesto, posing in form of theses a number of notions and categories intended to be questioned in the future.<sup>1</sup>

### 1. The audible as a foundation for the musical

The notion of music is indeed so culturally pervasive that it may seem unnecessary to put it into question. In any case, there are many reasons that prompt for taking into account the audible domain in relation to a semiotics of music phenomena.

- culturally: the variety of musical practices and outputs cannot easily find a common root apart from a perceptual one. While investigating the notion of music *in se*, Nattiez (1987) was able to find a common denominator only in the (eventually mediated) reference to sound. As an example, contemporary instrumental and electronic music often focuses on processes

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1. This article partly re-discusses and re-organizes some previous works by the author: Valle (2004a; 2004b; 2006; 2008; Lombardo & Valle 2002). Where not indicated, English translations are by the author.

of transformation of the sound matter (e.g. the by now classic movement of Spectralism). Many experimental approaches (e.g. in the so called soundscape composition) may be placed (and place themselves) at the boundary of sound design, while still considered socially (both by musicians and listeners) as music. Anthropological studies have remarked that many “musical” practices in various cultures have complex statuses, not easily attributable to music alone, at least from a Western point of view (a classic case, also for semiotics, being the Inuit practice of sound games, Nattiez 1989). If semiotics has to embrace an anthropological perspective, then it seems that music may find its basic definition in a set of practices, linked by family resemblance, that share as a minimum common feature the manipulation of the audible domain (in relation to the “qualities” of sound materials and their organization);

- ontologically: the role of perception is mostly left aside in music studies, buried under various higher-level layers that nonetheless are evidently built upon it. The very basic experience of music is a perceptual one. While this is a truism, still it cannot be given for granted for a semiotics: perceptual features reverberate on the other levels, *i.e.* on various practices, both on the performative and theoretical side, that operate on the organization of the audible domain. Of course, traditionally semiotics has simply skipped the discussion on perception by taking it for granted (see Eco 1975). On the other side, perceptual studies (and in particular in relation to the auditory phenomena) have shown the deep interbreeding of cognitive strategies that are rooted both into physiological and culturally-trained ones (e.g. Auditory Scene Analysis, that I will discuss abundantly later, Bregman 1990);
- methodologically: a desired outcome of focusing on the audible is the design of a descriptive metalanguage that may be shared by the semiotic community. A constant (and boring) refrain in the reflection about music both from musicians and scholars concerns the impossibility of a linguistic description of music content (see Valle 2004a). Among the scholars, this has led to a pervasive use of terms borrowed from Western traditional music theory (including the so-called CPN, common practice notation) and from other theoretical and technical domains (e.g. in the case of electronic music, from acoustics and from signal processing). If semiotics aims at describing its own field, then it has to propose a specific metalanguage. Such a requirement has been crucial in the Greimasian approach (Greimas & Courtés 1979, v. *Métalangage*) but Peirce already stated that a semiotic theory has to propose its own « barbarisms » (see C.P. 2.220);
- analytically: providing a descriptive metalanguage allows to consider all the audible phenomena from a unified point of semiotic observation, as it should be required e.g. in a study of enunciation in complex texts and practices. A typical example is film, where technical distinctions concerning the audio component (the traditional tripartition among voice, music, sounds) cannot

be projected onto the analytical level. A semiotics of film music may say something relevant about music, but constitutively cannot say anything appropriate about film enunciation, as it takes into account just one of the various audible components of the text. Moreover, these audible components are just an element of the overall process of enunciation that drives the film as a semiotic object. Mapping differences among various “formes de vie”, practices, objects and texts is indeed a pivotal point for semiotics, and this applies also while considering audible-only practices -such as music (in all its meanings), sound design (Lewdall 2007), sonification (Rocchesso & Fontana 2003; Hermann, Hunt & Neuhoff 2011) audio branding (Bronner & Hirt 2009). Taking into account the audible may thus provide an “interchange level”.

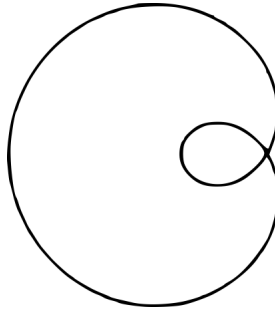
## 2. Requirement, I. A model of the body

If the body is the place of recording and production of meaning, then it is by definition a theoretical object that interests semiotics as a general « théorie de la signification » (Greimas & Courtés 1979, v. *Sémiotique*). The perceptual, as thematized in semiotics, may be seen as the domain of manifestation of this somatic dimension in each particular semiotics: in these terms, each semiotics records the semantic effects of the “physicality” of this body. However, the relationship between semiotics and the perceptual domain, in order to be taken into account by a “semiotics of perception”, can be explored only once two conditions are satisfied: the first concerns the respect of a technical definition of semiotics (the term referring here to the object, not to the discipline) as a biplanar system; the second requires a semiotic definition of the body itself.

In his pioneering proposal, Jacques Fontanille (1999, 2004) has already proposed a semiotic of the body. Fontanille considers the latter as a membrane that defines a fundamental and reversible partition between an inside and an outside, that allows to establish a place for the production of the semiotic function, separating — but at the same time tying together — expression and content.

The French semiotician has then proposed a « topique somatique » which, « élaborée à partir des différents types d’instance de référence, peut être considérée comme une matrice sémiotique indépendante de la typologie traditionnelle des ordres sensoriels, et susceptible de définir, par subdivisions, d’autres modes du sensible que ceux qui coïncident strictement avec les cinq sens » (1999, p. 45). In order to state the constitution (so far abstract) of the body as a function of the topological opposition between an interior and an exterior, the latter is modeled after the psychoanalytic observations by Anzieu (1985). The body is thus considered as a closed (or locally porous) region, its envelope (the « soi-peau ») defining the outward boundaries (the « monde-autre ») of an internal region (the « moi-chair »). The envelope is intended as an osmotic, double-sided membrane, that mediates between these two regions. Therefore, « le trait interne concernerait le rapport

entre l'enveloppe et le soi-corps propre, alors que le trait externe concernerait le rapport entre l'enveloppe et le monde pour soi ». This boundary defines « deux grandes orientations » : « d'un côté, un monde pour soi en relation avec le corps propre (le soi), et de l'autre, un monde pour moi, en relations avec le chair (le moi) » (1999, p. 48). From these basic assumptions, a possible semiotic model body can be proposed in the form of a topological figure such as the following (Figure 1), inspired by a looped “limaçon of Pascal”.



*Fig. 1.* A basic topological model for the body.

Such a very basic model of the body, while undoubtedly minimal, is topologically interesting because it proposes a closed envelope that includes a sort of enclosed gulf. It must be noted that the gulf reactivates internally the partition between an internal and an external. As an example, this is a peculiar feature of taste as a form of internal touch, that is, of an internal perceptual configuration that shows some features referring to the contact of the external envelope. Generalizing this aspect, it is possible to describe a recursive feature of the model: for each partition, another partition can be applied. Later, I will try to provide some arguments about the relevance of such a recursive mechanism for the audible domain.

Rather than providing a topological model, Fontanille has introduced a « topique somatique » that stems from the previous, more general observations (Figure 2) and that is built upon a four-level organization.

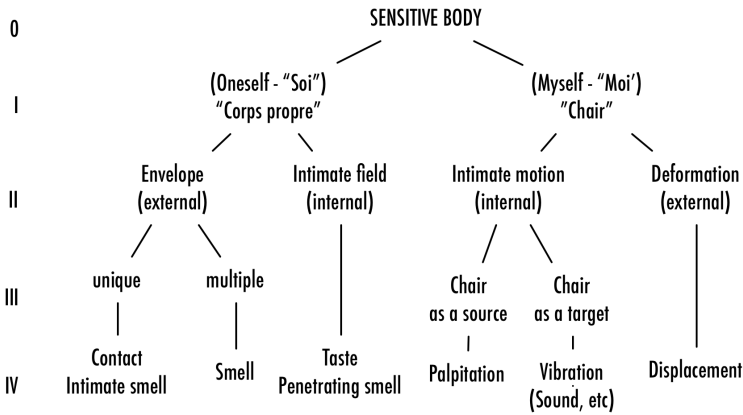


Fig. 2. « Somatic topic » (Fontanille 1999).<sup>2</sup>

Such a model has partly an ambiguous status. On one side, it proposes at its first levels (I and II, without considering the root node 0) a fundamental (theoretical and thus meta-historical) organization such as the one already discussed. On the other side, by introducing some operations (e.g. by means of quantitative operators such as « unique » or « multiple », level III), it allows (level IV) to describe a set of sensory orders. But, actually, the main idea at the basis of the proposal is that the body's perceptual regime operates by a « fundamental synesthesia » (1999, p. 220). Thus, level IV is not intended to provide a (fixed) typology of sensory channels. Rather, it deals with « la contribution de la sensorialité à la syntaxe discursive (et notamment à la syntaxe figurative), contribution qui est en général plurisensorielle et synesthésique » (1999, p. 2). As Fontanille states: « l'élaboration sémiotique du sensible commence juste après le contact élémentaire » (1999, p. 67). Thus, the hypothesis is that actual taxonomies of sensory channels are the result of cultural operations applied to the organization of perception. That is, cultures select and organize relevant features (taxonomies) from the possibilities provided by a general configuration of the body (topology).

In short, the basic idea is that an abstract, basic, synesthetic body is culturally organized (literally “channeled”) into a certain sensory paradigm.

A possible relation between the topological model and the *topique somatique* is shown in Figure 3.

2. The revised schema in Fontanille (2004, p. 173) provides for each node at level III a description in terms of field of presence, but does not introduce relevant aspects in my argumentation. Originally in French (« topique somatique »), English translation by the author.

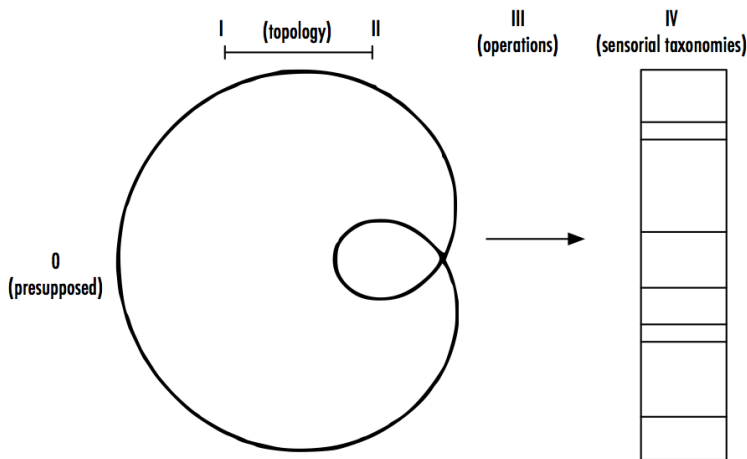


Fig. 3. Relations between topology and *topique*.

To sum up, five aspects are worth underlining:

- perception is a multilevel task where information is shared among various perception channels at different levels (Pierantoni 1996). So, it is not fruitful to consider audible perception as separated from other modalities, as all the sensory information contributes to the emergence of meaning;
- apart from such considerations, that stem from perceptual studies, semiotics may investigate such a model in describing interaction among modalities that are actually exploited by cultural practices;
- if a more general model is available, then some features of the audible can be spotted by comparison with other domains;
- such a theoretical framework operates as an integrating device, that allows to take into account from a unified semiotic perspective studies that come from heterogeneous fields (e.g. psychology, psychoacoustics, musicology, phenomenology, cultural studies);
- finally, by thematizing the crucial role of the “envelope” (the membrane intended as a closed topology) as a “carving” surface, a semiotics of the body is able to provide some hints in relation to a crucial notion of semiotics, enunciation, intended as the operation (and the resulting semiotic forms) in which a subjectivity reads and writes, or more generally, inscribes and recognizes, such semiotic forms on this envelope and in relation to other bodies that can be taken into account from a Greimasian perspective by means of the operation of *débrayage*. Thus, semiotics can be opened to the comparison with an « ichnology » (as a theory of the presence as a trace, Ferraris 1997) and with a « phenomenography » (that is built upon the idea of practicing on the « world as a sheet », Sini 2003 and stems from Peirce’s phaneroscopy).



To substantiate the previous arguments two examples can be made, that refer both to sound objects and listening practices (as I will discuss later, the two, coupled, notions play a pivotal role in my proposal).

First of all, it is possible to discuss two “forms” of sound, that is, ways in which some features of the audible in relation to the model of the body are made relevant by certain cultural practices. A first description of sound that seems widely attested in literature is related to the semantics of vibration. As a “compulsion to vibrate”, it can be described in relation to the topology as a solicitation of the interior of the *chair*. This is the place that Fontanille reserves to audible perception while discussing his *topique*. The soma then behaves exactly like a « corps sonore » (Schaeffer 1966), a sound source and a resonant body. As noted from a phenomenological perspective (Piana 1991), unlike what happens in the sensorimotor case, where motion operates as a shift of the center of reference (« a path of the thing traversing the space »), in vibration « the same movement is traversing the thing and running thorough it by shaking all its fibers » (Piana 1991, p. 80). These reflections allow to consider the sound body as the result of a *débrayage* from the body, literally as a soma excited from within. In another words, « vibration [...] introduces a principle of internal dynamics of the matter itself » (Piana 1991, p. 80). Here vibration, even if related to temporality, is a quality of sound that is stable in time: as consequence, sound is thus aspectually bound to durativity. Exactly as a consequence of this aspectual feature, sound in this respect is described as a quality. An evident semantics of sound as vibration is at the basis of most physical classic approaches. Notoriously, these approaches focuses on frequency and consequently on pitch. One may think about the abundant theoretical discussion on tuning in the history of acoustics. The classic models proposed by physics are based on a specific phenomenology, that of a sound that lasts, not that of a sound event (one may simply think to the ancient but still recent notion of *harmonia universalis*). Thus the history of culture (physics included) shows how a certain form of sound (rooted in linguistic and phenomenological categories -grounded if we want) has been exploited.

This “form” of the sound is at the basis of a crucial (and mostly time, fuzzy) notion in the cultural history of sound, “timbre” (Barrière 1991). Schaeffer (1966) clearly defined the notion of « timbre harmonique » as an overall quality of sound: « Nous appelons [...] timbre le halo plus o moins diffus, et d’une façon générale, les qualités annexes qui semblent associées à la masse [du son] et permettant de la qualifier » (1966, p. 516). This non-temporal feature of sound has been widely explored in psychoacoustics. Many studies have proposed « timbre spaces » that organize sets of sounds in relation to various features (e.g. Plomp 1976, Rasch and Plomp, Wessel 1979, Slawson 1985, MacAdams & Saariaho 1991). Such spatial organizations become possible as they are built upon qualities. That is, in order to be organized spatially, sounds here are properly intended as objects with stable, not-evolving features. A critical examination of timbre studies is of great interest for a semiotics of the audible, as it reveals a complex intricacy of categories,

borrowed from linguistics, phenomenology, music, acoustics (see Valle 2004b). Jumping to the conclusions, the form of sound emerging from all these studies is based on vibration. Sound loses all its material qualities. Instead, it is invested with energetic properties: hence the relevance in the studies of timbre spaces of a specific semantic category, “brightness”.<sup>3</sup> This energetic feature seems to push the audible domain near to the visible one, by means of a common isotopy of energy. Not by chance, timbre is defined in German as “Klangfarben”. And of course, one can think of Schoenberg’s Klangfarbenmelodie but also of the notion of spectrum, that has gained a high musical momentum since the Seventies, and that is based, through the mediation of physics, on the same assumption of a continuum between light and sound. Finally, Slawson (1985) has reasonably proposed to directly replace “timbre” with “sound color”.

By contrast to this vibrational model, a second model, partly submerged in Western culture, has been conceived. In this second phenomenological model, sound is considered as an aggregation of components. The main natural figures from which it takes inspiration are dust, drops, powder: it stems from an atomistic metaphysics. This notion of sound as matter, as opposed to sound as energy, pushes the audible domain near to the tactile one. In Lucretius, the atomism of corpora applied to sound results in discussing unusual sound examples such as the scraping of the throat and the screech of the saw (see the IV and VI books of *De Rerum Natura*; in general Serres 1977). Lucretius’s acoustics is based on friction and laceration, on crackle and burst. Here, the description of sound is no more based on atemporal qualities, rather on a syntax that involves various relations among bodies. In Seventeenth Century, Isaak Beeckman proposed again a corpuscular theory of sound. Interestingly, rather than taking into account the classic test beds for vibrational acoustics (strings and pipes), the Dutch physicist relies on very eccentric sound bodies. “The whole procedure” of sound generation « is compared to shaking a salt-cellar » (Cohen 1984, p. 127) and the « action of the sound globules » is explained as the « ruffling of a military drum, supposing that the soldier who operates the drumsticks were able to ruffle it with greatly increased agility » (Cohen 1984; p. 140). Finally, the idea of sound as matter has found a new musical interpretation in Iannis Xenakis (1971), who, after Gabor, has proposed for the first time the idea of a granular nature of sound, that is, that sound can be thought as an amass of sonic grains. What is relevant here is not the technical detail at the basis of Xenakis’ proposal, rather, the audible imagination that nurtures it. Again, the sounds that the Greek composer takes as a reference are related to burst, to dust, to crowds, to amasses of cicadas and crickets. In relation to the previously introduced model of the body, this second possible form of the sound is thus nearer to the tactile domain: rather than originating from the interiority of the chair, it can be traced back to the solicitation of the envelope. Thus, a form of “haptic”

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3. An isotopy of energy has been also proposed by Cogan (1984) who fostered an extension to music of phonological categories such as the one developed by Jakobson & Halle (1956).

sound. Such a form has never been dominant in the Western music landscape; still it can be retrieved in some marginal examples. On the other side, it plays an important role in the 11<sup>th</sup> century Japanese Heian culture. In the *Genji monogatari* (“the Tale of Prince Genji”), prince Genji many times refers to a music of insects, once even convening in his music a concert of crickets and cicadas singing in the fields (Murasaki 2000, Sestili 1996).

A second example concerns listening practices, and shows how audible perception is far from being a physiological, an-historical activity. Rather, it clearly illustrates the intricate plexus of relations between the physical body and its cultural determinations. In Bregman’s ecological approach to perception, the audible object is turned into a continuous, temporally modeled, « stream » (Bregman 1990). Listening becomes a streaming process, that is, a task that has its main goal in the allocating and grouping of the raw perceptual material in relation to a narrative/figurative framework. For Bregman, to listen is to solve the Auditory Scene Analysis problem, that is, to determine which are the (plausible) sources of the actual sounds. The main goal of Auditory Scene Analysis is thus explicitly narrative: its goal is to provide « a nice, consistent story about the sound » (Bregman 1990, p. 33). Moreover, as Bregman notes repeatedly, this reconstruction is always tentative and provisional, as it depends on a peculiarly large set of heuristics: the auditory scene analysis, as performed by the auditory system, is not a translation, more or less linear, of acoustics into psycho-acoustics, but a complicated negotiation where « heuristic criteria must be used to decide how to group the acoustic evidence. These criteria are allowed to combine their effects in a process very much like voting » (Bregman 1990, p. 33). Among these criteria, the historicity of listening plays a pivotal role. To listen is to know how to listen. Acquired competences are introduced into the heuristic poll and gain the right to vote, so to say, exactly as the other hardware-based heuristics. In such a complex scenario, even the so-called Miniature Scene Problem — where the auditory scene is reduced to only three sinusoidal signals (Bregman 1990, p. 216) — may lead to different perceptual results. In Bregman’s approach, psychology of perception has re-gained an important role in the description of high-level (so to say) music listening strategies.<sup>4</sup>

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4. ASA provides a model for both low *and* high level grouping of acoustic features. Bregman 1990 dedicates an entire chapter (no. 5) to music. A classic example of streaming is Baroque virtual polyphony (as already discussed by Bukofzer 1947), in which various voices are performed in sequence on a single instrument (e.g. cello) but appear as parallel voices. In less —or not— explicitly grammaticalized music, auditory grouping provides very interesting insights to discuss perception. One may think to contemporary instrumental or electro-acoustic music. ASA is not deterministic, and this is a major strength: different groupings are possible, and cultural heuristics are relevant in its epistemology.

### 3. The audible semiotically considered

Fontanille's proposal concerning the role of the body in relation to enunciation has at its core the phenomenological notion of "field of presence" (*champ de présence*) as a mediation that comprehends at the same time subject and object. This notion is re-defined from a semiotic point of view, *i.e.* as a way to describe its effect on enunciation. In this framework, an "audible field of presence" can be described as the way in which the audible perception prototypically manifests itself in relation to the categories of enunciation, where the "prototypically" refers to the set of most common/evident/relevant features as they emerge from various determinations, be they physiological, psychological or cultural.

A first general feature can be described in relation to the somatic model. As we have seen, the latter is built upon the idea of a fundamental boundary that detaches what is inside from what is outside. Also, we have proposed a recursive operation, that allows generating other partitions following the same procedure. The audible field is the best example of this feature as it challenges the notion of a finite, closed extension: the audible horizon encroaches directly into the body leading to the collapse between the inside and the outside. This collapse has been noted by various reports both by blind and deaf people (see e.g. Laborit 1994; Hull 1990). Emmanuelle Laborit, deaf from birth, notes: « in my interiority, there is not silence reigning. I hear whistles, very sharp ones. I think they come from another place, from the outside, but no, they are my noise, I only hear them. Are they internal noise and external silence? » (Laborit 1994, p. 315). Not by chance, in relation to the visible, rather than as an audible equivalent of darkness, silence has been described as white light, that is, as the place of maximum perceptual resolution (Chion 1998, p. 82). At its far limits, silence is thus experienced exactly as the collapse of the partition between the subject and the world. While listening in an anechoic chamber (where maximum silence is possible), John Cage reported that he was able to hear two sounds (Cage 1961, pp. 7-12). He asked the technicians about their origins, and thus he discovered that the two sounds were originated by his own body (*i.e.* by blood pressure and nervous system). In order to discriminate between his own interior and exterior, Cage had to apply a socio-semiotic strategy. Similarly, in the case of certain tinnitus (Moore 2004), in particular if not too intense and short-lived, the internal attribution (tinnitus, in fact) or external one (a very poor spectral signal, such as a far whistle) is a matter of debate for the same subject of perception, that can be solved by applying various semiotic strategies (e.g. "am I the only who is hearing it?"). In headphone listening, the sound is often traced back to an "unnatural" position of the source inside the head (Rumsey 2001, p. 59). This happens because the headphones are coupled with the head, and thus a sensorimotor strategy does not help in solving the auditory scene problem: thus, an external sound is re-positioned internally. It seems that our auditory hardware is built exactly to avoid this issue (Berg and Stork 1982, p. 145), an issue that nevertheless can always rise. In fact, a crucial phenomenological difference between

the visible and the audible is that we always see our body from outside, while, on the contrary, the body itself is a sound source and we literally hear our interiority. Thus, the audible field shows an indefinite extension: silence is placed at its fuzzy border, « maintaining our communication with the sound being » (Merleau-Ponty 1945, p. 427). Thus, the audible domain allows to shed light on the crucial role of proprioception in perceptual processes also from a semiotic perspective.

By discussing a heterogeneous set of studies, it is possible to investigate some features of the audible field in relation to the categories of enunciation. In relation to the latter, the notion of *débrayage* here in use is rooted in Greimas, but mediated by Fontanille. Fontanille's theoretical challenge is to provide an abstract model of the body that can take into account discursive effects. In this sense, enunciation is literally given a body, of course from an actantial perspective. This extension could be debated, indeed. But the point is that, assuming Fontanille's perspective, a *débrayage* is thus possible when "body effects" manifest themselves in discourse. Exactly because of this, it becomes possible to speak about audible actors as "*débrayé*" forms of the embodied enunciation. As an example, while speaking of the soundscape, Murray Schafer (1977) discusses the audible effects of the Columbia forest on the first settlers: the enormous body of the forest is awaiting them with a low, gloomy howl. Now, here the forest becomes an actor provided with some specific audible features that may be discussed in relation to the embodied model of enunciation. It is an audible actor because it results from a *débrayage* from the somatic model.

### 3.1. *Actoriality*

Audible actors manifest themselves primarily in the form of a mechanics. In essence, the "what?" always requires to be re-formulated in terms of the "what is it doing?". Listening is always listening to a scene populated by a plurality of actors that can be recognized only through their syntax of production. While in the visible domain some features define a structural configuration of an actor (its being), in the audible the actor is properly defined exclusively by its action (its doing). Recognizing the bark of a dog comes after recognizing that a dog is barking, but this indexical property defines the actor itself in terms of its own production. As pointed out both by psychoacoustic studies in relation to the phenomenon of masking (e.g. Moore 2004) and by ecological psychology, the audible domain is significantly different from the visible one. Bregman notes:

The auditory world is like the visual world would be if all objects were very, very transparent and glowed in sputters and starts by their own light, as well as reflecting the light of their neighbors. This would be a hard world for the visual system to deal with (Bregman 1990, p. 37).<sup>5</sup>

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5. Pierantoni argues that there is not an equivalent of an « acoustic sun », that is, « a continuous source of noise, perennial, periodic, focused [...] While the daylight is centralized, uniform,

As a consequence, actoriality is marked by a particularly significant instability. The audible seems to be characterized by a sort of actorial competition.<sup>6</sup> Noise (here intentionally in a generic sense) has received two complementary meanings, that can be described in relation to enunciation, that is, considering it as discursive form. On one side, it has been considered as a source of dispersion that absorbs the richness of possible actors; on the other side, it has been thematized as the possibility of a multiplicity of actors *in potentia*.

### 3.2. Spatiality

The audible defines a specific form of spatiality. Again, literature on deafness and blindness helps to shed some light on the topic by emphasizing some possible features *ex negativo*. On the one hand, it seems that the deaf have access to the world as a frame, a small world defined by a close extension, that has to be explored by a form of pure scanning: the space is a set of potentially disconnected surfaces, its specific features being clarity and discrete fragmentation (see the report by Laborit 1994). This prototypical space-as-a-frame is symmetrically related to a form of temporality that is typically local, a short timeframe activated through sensorimotor processes, for example in the gestures of sign language: here, time seems to appear as a modulation of space (Sacks 1989). For the blind, symmetrically, the world is not small, rather it appears to be sparse — its limit being a condition of emptiness — depending on frequency: the world of the blind disappears by progressively fading away. In blindness there is indeed a dominant temporalisation on space so that space is reconstructed through the set of activities that take place in it: properly, what is at rest does not exist (Hull 1990). If the visible space immediately presents itself as a unity that coordinates the mutual relations of the figures, the audible space is a field of multiplicity, a set of figures that precede their relations.<sup>7</sup>

### 3.3. Temporality

Indeed, temporality seems in general to be the prominent feature of the audible domain as it strongly affects both actoriality and spatiality. One may observe that in the audible the presence itself is radically defined in an aspectualized form: it gains a processual status. Presence is turned into presentation: « on comprend à présent que l'évanescence de l'information acoustique soit la condition de son intelligibilité et qu'elle détermine sa qualité » (Dufourt 1999, p. 77). Presence as

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directional, the sound is distributed more or less randomly, is unstable, variable, floating » (Pierantoni 1996, pp. 366-367).

6. In relation the psychoacoustic phenomenon of masking Chion observes: « le monde sonore est marqué par une idée de compétition et de gêne réciproque possible entre les différents sons cohabitant dans l'espace » (Chion 1998, p. 35).
7. Of course, I am referring to some emphasized, prototypical features. It would not make any sense to state that the deaf has not time and the blind is deprived from space.

(re-) presentation shows also another relevant aspect in relation to temporality. In order to be recognized, audible figures require a nested temporality. On the one hand, the identification of a figure supposes that the figure itself is placed in the context of a temporality that is “external” to the figure. But on the other side, the figure itself is still an object to be appreciated “in real time”, an intrinsically temporal figure which reveals (or at least, can reveal) an “internal” temporality. This aspect has been discussed by Schaeffer in the form of a recursive relationship between a sound object and a structure to which the former refers (see later). This recursive feature may be related to the same feature discussed in relation to the envelope in the audible domain. Each temporal level has to be referred to a specific form of relation to the somatic model, that is, to a specific operation of *débrayage*.

#### 4. Requirement, II. A theory of listening and a theory of sound

A semiotic theory of sound cannot exist, as sound *per se* cannot be defined in the epistemological scenario of semiotics. Vice versa, a semiotic theory of listening *per se* may indeed shed some light on listening as a cultural process, but it cannot discuss the object of the process that it refers to. In short, a « structural coupling » between a « subjectal » and an « objectal » side is required (Basso Fossali 2002).<sup>8</sup>

In his phenomenological approach,<sup>9</sup> Pierre Schaeffer has underlined this double constraint, and consequently proposed the relevance of two mutually related theories, a theory of sound objects and a theory of listening.<sup>10</sup> Thus, he has conceived a phenomenological model for sound description that does not deny the relevance of other approaches and their findings (e.g. psychoacoustics) but that did not rely on them. On the other side, he related the notion of sound object to the so-called four listening modes.

##### 4.1. A theory of listening

To start with the idea of listening practice, it can be noted that typically “listening” is intended as a singular term. As such, listening is meant as the activity of a subject in relation to the phenomenological, global field of audible presence. Schaeffer’s first move has been to turn the singular concept into a collective one: a set of four listening modes. Such a phenomenological multiplication articulates listening so that the theory can be effective in the description of a multiplicity of different

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8. In this sense, the main limit of the Fontanille’s proposal concerning a semiotics of the visible (Fontanille 1995) is to discuss only the “objectal” side.

9. Indeed, the inclusion of phenomenological assumptions in the theoretical foundation of semiotics may not be painless. But a dialogue with phenomenology has been historically crucial for semiotics, at least in the Parisian school, since Greimas’ *De l’imperfection* (1987), and then going on, with various options, e.g. in the cited approaches by Fontanille or Basso Fossali.

10. A fundamental discussion on Schaeffer (1966) is Chion (1983).

social practices. Schaeffer's argumentation starts from a semantic analysis. The philosophical grammar of listening leads him to recognize four different meanings, exemplified by the French verbs *écouter*, *ouïr*, *entendre*, *comprendre*, that I will keep in French in order to assign them a technical value (Figure 4).

1. *Écouter* indicates a figurative listening, in the sense of the Greimasian semiotics: as a recognition of the so-called « macrosemiotics of the natural world » (Greimas & Courtés 1979, v. *Monde naturel*). By “listening to causes” the subject is capable of reconstructing a landscape of sounding and resonating objects. In this sense, the world-as-a-utterer speaks the figurative language of things: it tells tales of energy, an « anedoctique énergétique » (Schaeffer 1966). *Écouter* is an attentive attitude but at the same time it is pacified by the possibility of bringing the sound back to a narrative economics.
2. *Ouïr* on the contrary implies a shift towards the listening subject. The modality of *ouïr* allows a re-semantization, intended as a suspension of immediate figurative cues so that a different “reading” (to speak with Barthes) of the sound can be performed. On one side, for Schaeffer this mode represents a sort of deposit of the perceivable. On the other side, it is a sort of toolbox: while the sound object is typically intended by Schaeffer as something more or less stable, by activating the mode of the *ouïr* it becomes possible to hear something different starting from the same source, by extracting new relevant features. Here, listening is “to be able to listen”.
3. *Entendre* indicates a selective relevance, an active moment of judgment. It is clearly not possible the *ouïr* without the *entendre*: a pure *ouïr* is conceivable only as an asymptotic limit. For Schaeffer, as in all structural semiotics, the value is related to the perception of the structure, because the structure is built upon differences of values. Schaeffer's famous example is related to listening to the ticking of the clock: « malgré moi, je lui impose un rythme » (Schaeffer 1966, p. 107). The *entendre* requires a specific operation: « qualification » as a “mise en pertinence” of some features of sound in relation to certain values.
4. *Comprendre* requires treating the sound following the Saussurean principle of linguistic arbitrariness (Schaeffer 1966, p. 115). As in *écouter*, in *comprendre* the sound object's perceptual essence is evacuated, because sound is relevant only in relation to what it stands for. The mode sums up all the linguistic, symbolic (in the Peircean sense) listening strategies, in which sound perception aims at identifying the signifier of a signified, following a strong code model.



4. TO UNDERSTAND ( <i>comprendre</i> ) - for me: signs - in front of me: values (meaning-language) Emergence of a sound content and <i>reference to, encounters with,</i> extra-sonorous concepts.	1. TO LISTEN ( <i>écouter</i> ) - for me: indicators - in front of me: external events (agent-instrument) Sound <i>production</i>	1 & 4: objective
3. TO HEAR ( <i>entendre</i> ) - for me: qualified perceptions - in front of me: qualified sound object  <i>Selection</i> of certain specific aspects of the sound	2. TO PERCEIVE AURALLY ( <i>ouïr</i> ) - for me: raw perceptions, vague idea of the object - in front of me: raw sound object  <i>Reception</i> of the sound	2 & 3: subjective
3 & 4: abstract	1 & 2: concrete	

Fig. 4. Table of listening functions (Schaeffer 1966, p. 116).<sup>11</sup>

The four modes are grouped in a four-part organization, a “table of listening functions” (Figure 4) according to two axes: the vertical one is based on the opposition between subjective/objective, the horizontal one on the opposition between abstract and concrete. In particular, the objectivity of *écouter* and *comprendre* can be thought as the “natural” intersubjectivity of the two Greimasian macrosemiotics, the natural world and the natural language (Greimas & Courtes 1979, v. *Monde naturel*), which pre-exist to the subject, while, on the other side, *ouïr* and *entendre* share a private nature. *Entendre* and *comprendre* represent the formal, abstract side as opposed to the concrete one of *écouter* (underlining the “evenementiality” of listening) and of *ouïr* (underlining an -asymptotic-“privateness” of the sensibility).

Some notes can be added to Schaeffer, starting from Schaeffer himself:

- listening is a practice according to the principle that « [l’auditeur] travaille son oreille comme [l’instrumentiste] travaillait son instrument » (Schaeffer 1966, p. 341);
- listening is defined as a set of interrelated practices: in this sense, the four-part organisation is deliberately heterogeneous with respect to a high/low level organization in the treatment of perceptual information. It does not operate following the distinction between hardware and software. Schaeffer’s perspective is a phenomenological and semiotic one;

11. Originally « Tableau des fonctions de l’écoute », translation courtesy by Christine North and John Dack for the forthcoming English translation of Schaeffer’s *Traité*, University of California Press. Figure 4 proposes also English translations for the modes, that I have left in French.

- the table is neither a chronology nor a logic. Its precise aim is « mettre en valeur provisoirement un certain nombre de processus habituellement non analysés » (*Ibid.*, p. 117);
- the listening activity always operates by activating all the four modes: « le déchiffrement de la perception s’effectue instantanément, même lorsque les quatre quadrants sont en jeu » (*Ibid.*).

The table can be reformulated in form of a graph, the vertices representing the listening modes and the edges that connect them representing all the possible relations between couples of modes. By turning the planar representation into a graph, the focus shifts from a static description to a dynamic one: in this way, it is possible to describe sequences of modes. As in every listening practice there is a continuous circulation among the four modes, the resulting graph is the complete graph  $K_4$  (Figure 5).

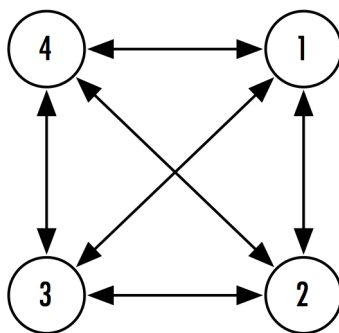


Fig. 5. Graph of listening modes.

From this hypothesis, a first definition can be derived:

*Every path on the graph, intended as an ordered sequence of vertices, represents a specific listening action. Listening as a practice can be thought as a specific sequence of modes defined as a path on the graph  $K_4$ .*<sup>12</sup>

The famous situation of the “cocktail party” is particularly relevant to exemplify the emergence of many different listening actions.<sup>13</sup> In the middle of a diffused, masking buzz caused by the mass of voices, at a certain moment it is possible to recognize a speaker: it is a reconstruction of the speaker starting from the sound material, “someone is speaking” ([2,1]). On the other side, the opposite path is typical too: from the perception of a voice to the focusing on the perceived material, “to give hear to” ([1,2]). While at a cocktail party, one can easily notice

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12. It is possible to further articulate the graph modelization so that it takes into account transformations among listening practices, see Valle (2008).
  13. The discussion does not refer immediately to music, as it is intended as a more general framework. Of course, the ratio is that it can be applied to music listening (in the broadest sense) as well.

that someone is speaking in French: it is a “qualification” of the sound material with respect to a certain system of features, such as the ones defined by the phonological system of French ([2,3]). If the speaker is speaking in French about politics, the language is intended as an expression of a specific content, and the access to sense defines a path ([3,4]). The typical linguistic listening can be thought as a direct connection between *écouter* and *comprendre* ([1,4]): in fact, the linguistic listening (in a situated, ecological context) is eminently the constitution of a relation between the voice of an utterer and the sense of the utterance ([1,4]): “*What are you saying?*”), and -symmetrically- the reconstruction of an utterer starting from the comprehension of the utterance ([4,1]: “*Who has said this?*”). While listening to a known person, the appreciation of the sound of the voice (2) is relevant only if the voice itself manifests some peculiarity: only in this case, the action seems to need to be described in terms of [1,2,4]. On the other side, while listening to a known voice, the relevance of the linguistic system is taken for granted. But if the utterer speaks in a language that the listener does not know well, the listening action of the latter seems to be [1,3,4], as the phonological system is not perfectly possessed by the listener, so that s/he has to focus on the uncertain results of the qualification.

If one knows a voice, s/he can retrieve it inside the buzz: from a certain set of features (its “timbre”) it becomes possible to locate the speaker ([3,1]). If such an operation requires a specific attention to the activity of sound (as John Cage would have said), the path would be [3,2,1]. On the other side, the buzz resulting from the interaction of a large number of speakers makes the listening situation acousmatic, as it blocks a stable audio-visual correlation. In such an immersive situation, there is a continuous circulation between 2 and 3: the extraction of phonological strings from a complex source ([2,3]) works in parallel to the “substantial” appreciation of phonetic fragments brought back to their sound nature ([3,2]). Finally, the extreme complexity of the cocktail party scene favors the unstable oscillation between the *comprendre* and the *ouïr*: in some cases, semantic shreds emerge from the buzzing ([2,4]), in other cases the sense progressively evaporates ([4,2]).

#### 4.2. A theory of sound objects

A theory of listening requires a theory of sound objects, and vice versa. As seen in the previous section, each listening practice literally defines its listening objects. Schaeffer’s *Traité des objets musicaux* (1966) has proposed a way to think about the audible domain avoiding the simple shortcuts of a pure acoustic approach (what Schaeffer 1966, p. 416 called « physique amusante », referring to his previous attempts with A. Moles, see Schaeffer 1952). Schaeffer’s phenomenological approach leads him, among the many other topics covered by his *Traité*, to articulate a theory of listening practices but also a theory of sound objects. The notion of sound object plays a double role. On one side, it has to be considered on the epistemological level as a limit (in the mathematical sense) of all the perceptual

practices related to it: in this sense, it can be seen as a Peircean dynamic object in Eco's interpretation (Eco 1975, 1997; hence on I will refer to this meaning of sound object as *so-1*). On the other side, it can be interpreted as the object correlated to a certain listening practice (*so-2*). In this way, a sound object (*so-2*) is a culturally-determined perceptual object that is still related to a "pure" perceptual source (*so-1*), the latter being *per se* not directly accessible. This construction guarantees to avoid a cultural solipsism, and is at the basis of the dynamic mechanism of listening discussed before.<sup>14</sup>

Apart from these epistemological considerations, a theory of sound objects has some methodological benefits. It provides some metalinguistic tools for the semiotic description of sound in all the sound-related practices (music, but also sound art, audiovisual texts, etc). Concerning the last point, it is my opinion that Schaeffer's analytical observations in the *livres IV-V* of the *Traité* still remain unsurpassed for their insight. Moreover, while phenomenology typically avoids a too strict formalization, Schaeffer's attitude, in this sense nearer to the (at the time) rising semiotics, results in a double-sided analytic device —the so-called « typo-morphologie »— which was intended as a multifaceted tool for the description of all objects of the audible domain. In particular, "typology" is meant as the description of a sound object in relation with other objects (in its « contexte »), while "morphology" is intended as a description of the sound object *per se* (in its « contexture »). As a consequence, different epistemological assumptions can be retrieved on the two sides of the typo-morphology: while morphological criteria are defined as a set of (originally seven) analytical properties (*i.e.* parameters having different values) characterizing a sound object, in the original proposal by Schaeffer, typology offers a geometrical-topological description of the same object in terms of the position that it occupies in a 2-dimensional space. The morphological point of view has been widely reconsidered (starting from the seminal contribution by Smalley 1986, see also Smalley 1999). A possible semiotic reconsideration of morpho-typology may distinguish between the two sides of the theoretical device. On the morphological side, it is possible to assume an open set of features (rather than a closed one, as in Schaeffer): such a set could be fine-tuned in relation to each analysis. This proposal would match the requirement for local relevance of features in semiotic analysis. The typological side could be assumed as a reduced meta-organization of features that provides a global framework for sound objects in the

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14. Schaeffer (1966) has proposed an operation of "reduction" as a way in which it is possible to reconsider a certain perceptual organization *so-2*. Here, reduction is modeled on the Husserlian *epoché*, as a suspension of the previous determinations that an object has received. This return to perception was partly intended by Schaeffer as an access to a sort of audible purity provided by a specific practice that Schaeffer defined as "écoute réduite" correlated to sound object, here conversely intended as a sort of "pure" audible percept (*so-3*). From a semiotic perspective, such a *so-3* is simply a form of *so-2* guaranteed by *so-1*, even if it shows a specific interest as a form of "purer" perceptual description. Valle (2006) and (2008) proposes a recursive graph construction in which new practices still refer to the same *so-1*.

perspective of a semiotics of the audible. The idea of a typology as a geography of sound (a « cartographie du sonore potentiel », Risset 1999, p. 156) has never been consistently developed, apart from the definition of timbre spaces (see before): as I discussed, the latter are not intended to be as general as Schaeffer's typology and are mainly based on psycho-acoustic assumptions instead of phenomenological ones. In the *Traité* the formalization operates *a posteriori*: first, the six most relevant typological categories for sound description are identified (« masse », « variation », « durée », « entretien », « facture », « équilibre »), then they are tentatively combined in a 2- dimensional space for sake of simplicity (« dans le cadre d'une épure a deux dimensions », Schaeffer 1966, p. 436). I am suggesting here that four semantic categories can be extracted from Schaeffer's original proposal in relation to my previous considerations: sustain, profile, mass, variation.

Sustain can be proposed as a category for the description of sound objects' internal temporality. Schaeffer has proposed a linear organization in terms of continuous vs. iterative. Sustain here directly refers to how the inscription happens on the surface of the envelope. It describes the way in which a mode of production emerges from sound: continuous solicitation vs. iterated action. Schaeffer also proposed impulsion as the "dispersion point" between the terms of the axis. An impulsive sustain is thus at the limit both of the continuous and the iterated. In fact, in the impulsion, the continuous feature is reduced to a single event, while iteration requires by definition a multiplication of a single impulse. Thus, in relation to sustain, we have

- *sustained*: constant activity over time;
- *impulsive*: activity as a singular moment;
- *iterative*: activity as a series of repeated contributions.

Internal temporality of sustain requires the definition of an external temporality, the profile. While sustain defines the way in which a sound object is maintained into duration, profile describes its external temporal form. Schaeffer has noted that there are substantially three modes in which audible time is appreciated: by constantly integrating time while the sound is enduring; by appreciating an overall time-form in an optimal memory frame; by catching a single event that is immediately thrown into the past. Semiotics has already proposed three categories (borrowed from grammar) to describe temporal aspectualization: durativity, inchoativity, and teminativity. In relation to temporal macroform, it is possible to define three situations:

- *eumorphism*: relevance of all the three categories (inchoativity, durativity, teminativity). The sound object has a well-defined temporal shape;
- *amorphism*: durativity dominates, inchoativity and teminativity are irrelevant. Amorphous sounds are sounds that lasts indefinitely;
- *anamorphism*: profile is compressed, inchoativity and teminativity coincide, durativity is irrelevant. It is the case of sound objects as events.

Sustain and profile, micro- and macro-temporality are orthogonal categories, with one exception. An eumorphous or amorphous sound object may show a continuous or iterated sustain. But the two temporal categories collapse in the case of impulsive sustain and anamorphous profile.

As a general (and indeed generic, but useful exactly because of this) quality of sound, Schaeffer has proposed the notion of mass. Mass is intended as a generalization of the notion of pitch: « la masse d'un objet sonore, c'est sa façon d'occuper le champ des hauteurs ». Even if Schaeffer refers to a “field” (*champ*), mass is organized along a linear continuum, from low to high register. Differently from pitch, mass does not take into account a single dimension, rather it is based on two notions: site as a position on the continuum (*i.e.* as the actual register of the sound object) and caliber, indicating properly a range of occupation. Traditionally pitched sounds thus have a limited caliber that allows estimating, even if with variable precision, their site (e.g. an actual pitch). Traditionally “noisy” sounds can be considered as having a greater caliber: in these cases, site can be estimated only as a register (e.g. low, medium, high). Schaeffer has provided two extreme (technological) cases for mass: sinusoidal sounds, that have a specific site and a mass reduced to a point vs. white noise, in which caliber has an extension that covers the whole axis, thus making an evaluation of site impossible/useless. Finally, temporality in specific relation to mass is articulated by Schaeffer by introducing variation as a criterion, that allows to describe how much the mass (site/caliber) changes in time (from stable to varying objects).

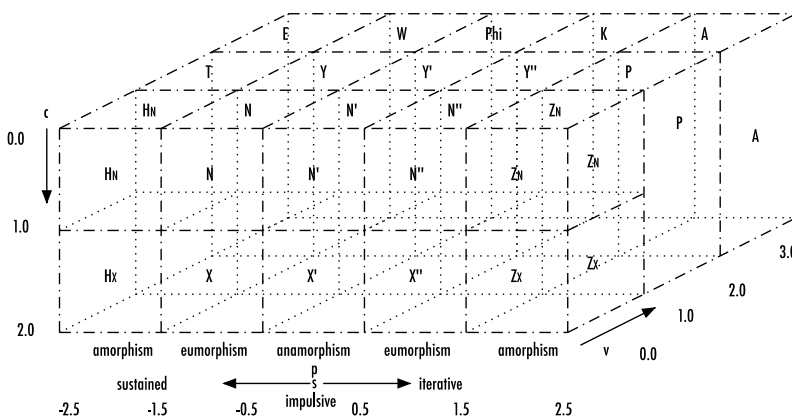


Fig. 6. A typological space for annotating sound objects

Moving from the epistemological to the methodological level, it is possible to organize the previous typological criteria into a typological space that is i) continuous; ii) consistent; iii) usable in an intersubjective way. Thus, a 3-dimensional (plus 1) space model can be proposed (Lombardo & Valle 2014). In the model, the space is defined by profile/sustain, caliber, variation and it is (at least formally) continuous.

Figure 6 shows the resulting space. The horizontal axis refers from left to right to sustain (sustained, impulsive, iterative) and from center symmetrically to left and right to anamorphism, eumorphism, amorphism (as discussed, sustain and profile are orthogonal, apart in the case of the coupling impulsive/anamorphism). The vertical axis represents mass, and in particular caliber, increasing from top to bottom, while the  $z$  axis is intended to represent variation. Partitions of the space can be defined that represent sound object typologies (classes in Schaeffer, in Figure 6 shown by labels, see Lombardo & Valle 2002). An interesting possibility is to convert Schaeffer's qualitative space into a quantitative one by assigning an explicit and arbitrary range to the 3 (4) dimensions of the typological space. In Figure 5, the axes receive numerical ranges that have the only means of providing a reference for an explicit annotation. The model of this operation lies in the evaluation of human practices by a competent community.<sup>15</sup> In this way, it is possible to differentiate sound objects belonging to the same class and to define trajectories in the space representing transformations of sound objects.

Such an analytical device can be useful in order to describe the plane of expression for a certain figurative/narrative content. It provides semiotics with a metalanguage to take into account the way in which sound contributes to signification, not only in music but also in cases where the whole audible dimension is at stake as an element of a complex textual strategy. As an example, a very well known case-study in film theory about the use of sound is the opening sequence of Sergio Leone's *C'era una volta il West* (Valle 2011). The sequence starts with a very long moment where only diegetic sounds are audible. In a deserted and silent station, three men arrive. They are waiting for the incoming train. A passenger gets off the loud, puffing train, and we understand that he has been awaited by three killers to be executed. The conclusive duel finally introduces music. Typically, analyses focus separately on two aspects, sounds and music (a classic topic in the discussion of Leone's work).<sup>16</sup> Rather, a detailed analysis based on typological criteria (that may involve an explicit annotation stage) shows how the sequence is organized into three sections with clearly different sound objects. The first section is mostly filled with sparse, varying, anamorphic sounds with large caliber, accompanying the arrival and waiting of the men at the station. The second section (the train at the station) is dominated by the clearly, rhythmically-structured train sounds, still with relevant caliber but now unvarying. In the final section (the duel), sound material becomes organized not only with a clear rhythmic pattern

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15. An interesting example is rock climbing in mountaineering. The description and evaluation of a route on a rock wall by climbers depends both on the objective features of the rock and on the competences of the community in relation to the specific practice of climbing. The community defines and controls intersubjectively the description. The rock is "annotated".
16. On the contrary Chion (1998, pp. 88ff) hints quickly at a typological analysis. But he obstinately refuses to take into account the audible as a plane of the expression for a semantic content and his analysis does not provide any cues on the sense of the actual sense of the sequence.

but also in relation to small-caliber (note-like), unvarying sound objects, that is, by music. Now, this process, which can be observed in relation to the audible domain, operates as the plane of expression for a plane of the content that is centered on a narrative organization built around the isotopy of the “waiting”. On one plane, an initial, stochastic accumulation of heterogeneous sound materials is progressively organized first into a rhythmic pattern of homogenous sounds, and finally into a harmonic/melodic structure; on the other plane, an accumulation of unrelated facts (one may think about the random gestures performed by the three men, not yet revealing themselves as killers) is progressively organized along a narrative axis, first the waiting of the train, finally the program of action which includes the execution of the stranger. This complex, progressive narrative construction stages its own making through the sound. It flips on the viewer/listener (in an “enunciational” form) the “enunciated” waiting of the killers. The viewer/listener is absorbed into the acoustic transformation of sound objects modulating the temporality of the enunciation as the narrative construction progressively builds up. Taking into account only “sounds” or “music” simply prevents to grasp the overall process of enunciation, which operates by rendering semiotically homogeneous a set of heterogeneous pre-semiotic facts.

## 5. Conclusions

The aim of this article was to propose a unified framework for the semiotic description of the audible domain. This is a clearly demanding task, which would require, for each of the introduced topics, a much more thorough discussion. However, it has been noted that a fragile generalization has its strength exactly in its weakness, because a certain theoretical structure can be deconstructed only if it has been previously (even if tentatively) articulated (Fabbri 1998, p. IX-X). Above all, generalization is an essential operation for semiotics, as a fundamental epistemological assumption of structural semiotics is that the structure is prior to its parts. From this point of view, a semiotics of music is only possible if it is defined in a general semiotic framework. Hence the proposal of founding the latter on a semiotics of the audible, in turn considered as a specification of a more general semiotics of perception.

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