Mimetic Space: a conceptual framework for the discussion, analysis and creation of mimetic discourse and structure

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Abstract

Electroacoustic *mimetic discourse* opened new semiotic channels through its potential to immerse the listener in virtual sonic realities, exploiting our innate mechanisms for source bonding[1]. However, the product of years of creative practice exploiting mimesis suggests the need for development and refinement of the conceptual tools arising from such mechanisms.

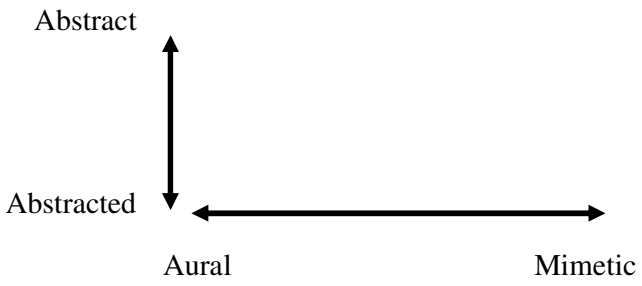
This paper aims to provide an initial version of a framework and terminology for the discussion, analysis and creation of music that articulates mimetic discourse and structure. In doing so, it also aims to provide parallel and complementary approaches to those to those concerned with the aural and spatial aspects of musical articulation.

The discussion begins by proposing the notion of multi-dimensional *mimetic space*, taking as its point of departure Emmerson's *Language Grid* (Emmerson, 1986). This is followed by the construction of mimetic continua, similar in function to those proposed by spectro-morphology, but applicable to mimetic material. Once these are established, the argument focuses on the implications of the introduction of live performers in works that articulate mimetic discourse. It then concludes with a perspective on narrative as a component of mimetic space; introducing the concept of *signifier space*.

Mimesis and Emmerson's Grid

Emmerson first defined *mimetic discourse* as that which imitates nature (i.e. the physical world) or aspects of human culture not usually associated with musical material (Emmerson, 1986). He also applied this concept in the construction of a *Language Grid* in order to understand the relationship between syntax and electroacoustic materials; where the latter form a continuum spanning from aural to mimetic (figure 1).

Figure 1 Emmerson's Language Grid.



An examination of the Language Grid suggests that there are various levels[2] within which electroacoustic music is articulated depending on the materials and the ways composers organise these into discourse and structure (see figure 2). At a primary level, there is the temporal shaping of spectra and their interrelationships: this is the realm of spectro-morphology (Smalley, 1986, 1997). Therefore, it is reasonable to propose that discourse and structure are always articulated at a spectro-morphological level, regardless of the region in the Language Grid articulated by a particular work.

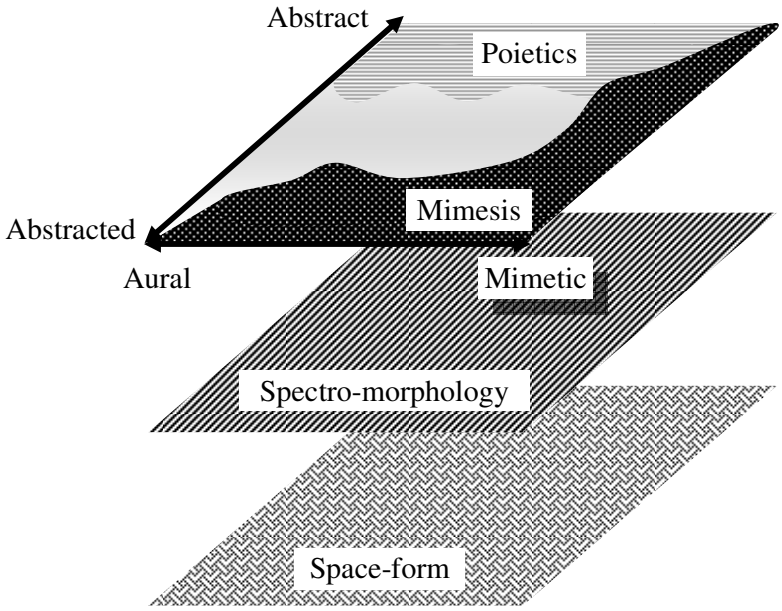
[1] 'The *natural* tendency to relate sounds to supposed sources and causes, and to relate sounds to each other because they appear to have shared or associated origins' (Smalley, 1997, p. 110).
[2] In this context, the term 'levels' is not intended to denote hierarchical positions or bearers of aesthetic value, but rather particular vantage points from which one may obtain a different perspectives of syntax and structure.

Recently, Smalley has advanced the more comprehensive concept of *space-form* as an 'approach to musical form, and its analysis, which privileges space as the primary articulator. Time acts in the service of space' (Smalley, 2007, p. 56). Poietic considerations also provide important information, particularly through writings, programme notes, compositional sketches and diagrams produced by the composer. This is particularly relevant to abstract syntax: regardless of whether the poietic is aurally identifiable in the work without prior knowledge, and actually because of the fact that it may not be apparent, poietics can shed light on matters which would have otherwise been lost, such as abstract[3] structuring processes (e.g. Xenakis' stochastic chains in Analogique-B), programmatic elements in the music, etc.

Mimesis requires another level of engagement related to *source bonding* (Smalley, 1997, p. 119) and *surrogacy* (ibid., p. 112), and its implications to syntax. While the construction of meaning in these works relies on the 'considerable practice at the concrete aspect in daily life' (Smalley, 1986, p. 64) on the part of the listener[4], I propose that a closer look may reveal a multidimensional entity (analogous to multidimensional timbre) within which mimesis is articulated: in keeping the consistency with an analogy to multidimensional algebraic space[5], I propose to call this *Mimetic Space*.

Finally, it is worth pointing out that there are regions of overlap between levels: for instance, particular poietic strategies such as algorithms for the creation of granular clouds may have direct effects on spectro-morphological syntax. Alternatively, certain spectro-morphologies may result in closer surrogacy due to typology of movement, energetic profiles, etc. (e.g. the profile of 'waves' or 'wind').

Figure 2 Levels of articulation in Emmerson's Language Grid: although this diagram uses planes to represent these levels, one should not forget that they are multidimensional entities.



[3] As opposed to abstracted in Emmerson's syntax axis.
[4] As opposed to construction of meaning out of timbral attributes
[5] Cf. *spectral space* in Smalley, 1997, 2007.

Aural – Mimetic continuum

In illustrating the regions of the Language Grid, Emmerson presents short case studies which are classified according to different regions along the line joining abstract and mimetic materials[6]. In these cases, the syntax is assumed to be contained within a bounded region. However, further examination of the electroacoustic repertoire reveals works that articulate time by actually moving along the *aural-mimetic continuum*. Therefore, the latter provides a reasonable point of departure for the construction of mimetic space.

Articulation of structure and discourse within this continuum is achieved by means of motion through surrogacy orders from first to remote orders (direct source bonding to aural material) creating expectations that are fulfilled or contradicted in order to achieve tension and relaxation. In fact, many works thrive in the regions of *ambiguity* of the aural-mimetic continuum.

As a short case study, I will examine some aspects relevant to this discussion in Dhomont's *Espace/Escape* (1989): on first impressions, this work offers a number of 'windows' into mimesis such as the sounds of trains, environments in railway stations and congregations of people. Thus, at this initial level, one could argue that it articulates transitions between aural and mimetic discourse with instances of the latter occurring at strategic moments in the piece, and acting as structural 'signposts'. However, more detailed listening reveals tighter links within the aural-mimetic continuum. For instance, the first appearance of a train horn (1:49-1:59) is resolved into a graduated continuant: while the latter leads the discourse away from the mimetic to the aural, it maintains surrogate links to the train horn as a result of pitch and morphological affinities, acting as a stretched prolongation of the train[7]. Furthermore, the pitched graduated continuants appearing later (3:25 and 3:33) acquires train horn connotations, particularly in view of the kinship between the evolution of their pitch and a Doppler shift. Therefore, they can be located in a region of ambiguity mid-way between mimetic and aural. The second of these pitched streams is given a prolongation that becomes a granular drone of wider spectral bandwidth, suggesting again a process of shift towards the aural. In other passages, it is also possible to establish similar relationships between human voices and abstract pitched continuants, based on rhythmic articulation and formants.

Phonographic – Constructed continuum

A detailed description of phonography (related terminology includes *soundscape composition* and *acoustic ecology*) is beyond the scope of this paper[8]. For the purpose of the current discussion, we will identify *phonography* and its concern with the capture of sonic environments, and point out that 'in soundscape composition the artist *seeks to discover* the sonic/musical essence contained within the recordings and thus within the place and time where it was recorded. The artist works with the understanding that aesthetic values *will emerge* from the recorded soundscape or from its elements' (Westerkamp, 2002, p.54.). Phonography is 'distinct from recording in general only to the extent that the capture of sound is privileged over its production. This bias reflects an attempt to discover rather than invent' (Dumiel, 2007). Furthermore, the term 'phonography' owes its etymological origins to a parallel with photography, which differentiated itself from painting and illustration, suggesting an analogy of the latter with constructed musical discourse (Cf. Dumiel, 2007). Therefore, the contrast between discovery and invention, or the degree of intervention of the composer provides another dimension for the articulation of mimesis.

As a short case study illustrating this type of articulation, I will examine Norman's *People Underground* (1991), which presents the sonic environment of foot tunnels underneath the river Thames in London: while it features extended sections where field recordings are virtually untouched (e.g. 5:36-6:34 and 10:45-13:28), it also moves into the realm of the constructed; sometimes seamlessly, sometimes more abruptly. This is achieved through the use of filtering to blur the sonic imagery (e.g. 9:53-10:28), surreal reverberation (e.g. 4:08-4:28) and intentional interjections of silence (e.g. 8:41-9:08), which are

[6] For instance, Ferrari's *Presque Rien No. 1* (1970), Wishart's *Red Bird* (1977) and Stockhausen's *Telemusik* (1966) exemplify works in which mimetic discourse is predominant whereas Stockhausen's *Studie I* and *II* (1953/4), and Parmegiani's *De Natura Sonorum* (1974-5) exemplify works with predominantly aural discourse, while McNabb's *Dreamsong* (1978) is situated between these two extremes.

[7] Whether the graduated continuant is indeed the result of time-stretch processing is irrelevant in this case.

[8] For detailed discussions of phonography, soundscape and environmental listening see Westercamp (2002), Levack Drever (2002) – who compares it with modern ethnography -, Arden Hill (2007), Schafer (1977), publications from members of The World Soundscape Project (http://www.sfu.ca/~truax/wsp.html) and the World Forum For Acoustic Ecology, WFAE (http://interact.uoregon.edu/MediaLit/wfae/home/).

particularly poignant in view of the overall reverberant ambience[9]. Nevertheless, the most 'interventionist' device used by Norman is repetition, which is used effectively at various levels. Firstly, it functions structurally by repeating some of the recordings at different moments in the piece, initiating a referential process: this is the case with the readily identifiable high pitched utterance of the word 'sorry' at 6:40 that reappears at 11:28. Another example, within shorter time scales, consists of the various appearances of an adult male's phrase, which is first heard at the beginning of the piece (0:05) and reappears initiating subsections of new material based on the overt manipulation of the phrase (e.g. 0:20 and 0:25). Secondly, repetition is used as a rhythmic device. This is evident in the granulation of the same male's phrase between 0:09 and 0:14, and the slower looping between 25:00 and 31:00. Thirdly, repetition is used as a timbral device; for instance, as a result of the spectro-morphological alteration of the male's voice through granulation, as well as the repeated echoic resonance of the slow looping.

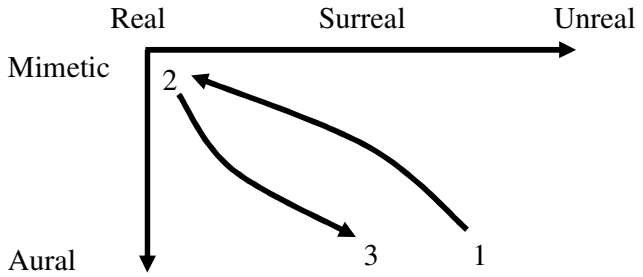
Real - Unreal Continuum

The power to create virtual spaces afforded by the acousmatic medium has been discussed in detail by various authors[10]. Wishart, in particular, takes as a point of departure the concept of *virtual acoustic space*[11], describing various possibilities for the construction of such spaces (1985, pp. 79-80; 1986, pp.47-49) and the articulation of transitions between these (1985, pp. 85-86; 1986, pp.50-52). Virtual acoustic spaces range from a re-presentation[12] of reality to the unreal. This range includes within it the surreal; whereby, despite the fact that the sources and the space they create reproduce reality, 'the relationship of the sound images is impossible' (Wishart, 1985, p. 80; 1986, p. 48). This suggests a continuum with *real* and *unreal* in each extreme, including in it the *surreal*.

We can now begin to examine multidimensional articulation of mimesis by means of an example that moves within the 'plane' formed by real-unreal and aural-mimetic continua; in this case, *Le sommeil*, from *La disparition* (1988), by Christian Calon[13]. This movement begins with high frequency gestures moving through the stereo field (7:12). Gradually, these dissolve into a canopied texture initiated at 7:25. The discourse is purely aural although there is a vestige of surrogacy to flight and bird utterances, which is confirmed by subsequent events. Therefore, although the discourse is rooted in the aural and tends towards the unreal, it is not totally unreal; as indicated in figure 3, position 1. At 7:34, bird-like calls begin to emerge, while the texture begins to resemble a background of insects and the virtual space becomes a natural outdoor scene. The voice of a distant female singer at 7:54 completes the transition towards the mimetic/real; represented by position 2. At 8:08, the drone of a distant aeroplane that initiates from the resonance of one of the singer's utterances begins its approach. Once the scene is established, it begins to dissolve through the thinning and fadeout of the bird/insect background, the slight distortion and fadeout of the singer's voice, and the evolution of the aeroplane drone foregrounding its characteristic Doppler shift as descending spectral motion. This draws our attention to the timbral aspects of the sounds, rather than their mimetic implications: in other words, the articulation of discourse becomes aural. However, the material still maintains a surrogacy relationship with the sonic image of an aeroplane. This relation is surreal because of the unusually low frequency content of the drone, its increase in dynamic level [14] and the exaggerated reverberation: the behaviour of the aeroplane is impossible. The process is completed at ca. 9:00 (represented by position 3), when the pitched graduated continuant swells further (both in dynamic level and spectral content) and proceeds to fade out while continuing its spectral descent, concluding the section at 10:04.

[9] The reader may also refer to the poietic information provided by the composer in the CD sleeve.
[10] Cf. Wishart, 1985, p. 90 and 1986, p. 54; Norman, 1994 and 1996.
[11] The imaginary space projected by the loudspeakers; as opposed to *real existing acoustic space*, e.g. a room with speakers (Wishart, 1985, p. 73)
[12] The hyphen is used intentionally to differentiate this from representation, since the sounds are presented as they were recorded rather than by allusion.
[13] Timings are relative to the beginning of the whole piece. *Le sommeil* begins at 7:12.
[14] In the physical world, a descending Doppler shift indicates that an object is increasing its distance from the listener; therefore one would expect a corresponding decrease in dynamic level.

Figure 3 *Le sommeil*, from *La disparition*, by Christian Calon. Articulation in the 'plane' formed by the real-unreal and mimetic-aural continua. 1) High frequency gestures and textures (7:12). 2) Birds, insects, singer (7:54). 3) Completion of the transition from aeroplane drone to low frequency graduated continuant.



Live performance

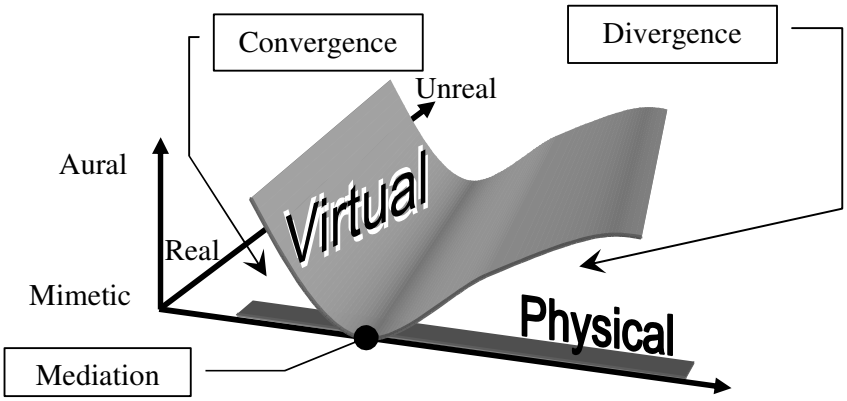
The introduction of performers focuses attention back towards the physical space where music takes place. Smalley has recently proposed the term *arena space*[15] to denote 'the whole public space inhabited by performers and listeners' (Smalley, 2007, p. 55). He points out that 'In public performances where instruments and acousmatic sound are combined, there can be a duality of play between the arena space produced *in situ* … and the 'arenas' of otherness created by the interaction of, or contrast between, gestural/ensemble space [i.e. the space enacted by the performers] and the spatial context carried by acousmatic sounds' (Smalley 2007, p. 44). Smalley also discusses the fact that acousmatic music can transcend the performance space: 'with acousmatic music in public contexts, the spatial image can liberate itself from the physical presence of the listening space – it can escape its arena' (Smalley 2007, p. 53).

While these statements refer to the perception of space per se, this has inevitable mimetic implications, since 'The idea of source-bonded space is never absent' (Smalley 2007, p. 38). Therefore, it is a straightforward step to extend the concept of duality to mimetic 'arenas' whereby there is interaction or contrast between the physical reality enacted by the performers and that carried by acousmatic sounds. Furthermore, since the virtual space of acousmatic music can 'escape its arena', it can also articulate discourse mimetically through the development of its temporal relationships with physical reality.

In order to illustrate this, I will discuss a passage from my own work *No Me Quedo …* (2000) for ensemble and digital audio. The fifth and final section (12:51) begins with an approaching virtual conga drum, which emerges from abstract material, providing beat and tempo, as well as the musical context (rumba rhythmic pattern) for the entrance of the instruments: this is a process of *convergence* between the acousmatic and the physical arena. After the appearance of a cue (abstract gesture) in the acousmatic part (13:19), the percussionist begins to play, followed by the rest of the ensemble, while the acousmatic part settles temporarily into the maintenance of the virtual conga material and its contextual implications: at this point, the loudspeakers act as *mediators* between the performers and virtual arenas in the acousmatic part. At 13:24, the virtual conga begins to dissolve into the unreal through processes of spatialisation, distortion and fade, being superseded by aural material, and transforming the virtual arena from mimetic to aural and from surreal to unreal: this is a process of mimetic *divergence*. A schematic view of the temporal relationship between the virtual and the physical arenas is shown in figure 4.

[15] A term borrowed from Emmerson.

Figure 4 A schematic view of the temporal relationships between the virtual (acousmatic) and the physical arena in *No Me Quedo …* (12:51-13:46)



Narrative – *Signifier Space*

Undoubtedly, mimetic space would not exert its semiotic power if it were not capable of allowing the unfolding of narrative. Wishart advances the concept of the *sound-image* elaborated as metaphor. Thus, 'by articulating the relationships between sound images we could develop not only sonic structures … but a whole area of metaphorical discourse' (Wishart, 1985, p. 89; 1986, p. 52). This is achieved by means of 'a whole matrix of related and transforming images [within which] the metaphorical implications become increasingly ramified' (Wishart, 1985, p. 91; 1986, p. 54).

Wishart's matrix of related images may be expanded to become a more generic archetype discussed by Nattiez, who taking Pierce's conception of the *sign* as a point of departure and Cassirer's terminology, identifies music as a *symbolic form* with the capacity 'to give rise to a complex and infinite web of interpretants' (Nattiez, 1990, pp. 8 and 37). Thus, in addition to the web of aural interpretants and the continua discussed in the previous sections, sonic materials with the capacity to instigate meaning through processes of source-bonding and surrogacy become mimetic interpretants in the construction of narrative meaning. In other words, they can 'tell a story' in the sense alluded by Wishart (1985, p. 91; 1986, p.55). This web of interpretants may be grouped into *paradigmatic axes*, or 'axes which group together identical or equivalent units from an *explicitly* stated point of view'[16] (Nattiez, 1982, p. 245). We can now define *signifier space* as a subset of mimetic space constituted by the paradigmatic axes generated by the signifiers; where the dimension of signifier space is given by the number of constituent paradigmatic axes.

However, signifier space presents difficulties in its regimentation. In order to illustrate this, I will discuss briefly the possible meanings of some signifiers in a short excerpt of Wishart's *Red Bird*.

A segmentation of the passage beginning at 37:47 and ending at 38:39.7 (figure 5) reveals five sections of 'vocal machines' (human and animal utterances organised into repetitive patterns), each followed by an equal number of interludes, described in table 1. Also, in its third appearance, the 'vocal machine' morphs into a groan.

This segmentation suggests a paradigmatic axis comprising the vocal machines. On the other hand, the variety of material in the interludes presents some complications: even if we take account of poietic information provided by the composer, the construction of paradigmatic axes still presents a number of possible variants. In the present case, the grouping processes takes account of Wishart's statement regarding *Red Bird*'s concern with 'the opposition between Open and Closed conceptions of the world … defined in relation to specific and different areas of thought' (Wishart, 1985, p. 92)[17]. Therefore, assuming the machine to be representative of closed, rational, conceptions, we can try to

[16] For a discussion of the use of paradigmatic axes in conjunction with spectro-morphology for neutral analysis of aural electroacoustic music, see Fischman (1995, 1997).
[17] The ensuing discussion assumes some familiarity with Wishart's description, which would be too extensive to include in this article.

group the sounds in the interludes as corresponding to the 'closed' axis of the 'vocal machines' or to an alternative axis representing 'openness'. More specifically, we will now focus on *(r)eazznM*, which is a particular utterance of the word 'reason'.

On the one hand, we may group this utterance with the signifiers of the 'closed' paradigmatic axis, since it alludes directly to 'reason' and, by inference, to the ubiquitous phrase 'listen to reason'. Furthermore, 'reason' is also the logic that creates machines. On the other hand, *(r)eazznM* is a distortion of the actual word, which also emphasises the buzz of a fly through the extended phoneme 'z', indicating an affinity with the insect featured in 'interlude 5'. The fly itself may be considered to be a signifier of openness, because it is free to take to the air and because it is persecuted by 'reason'[18]. Therefore, in view of its distortion (freed from the constraints of 'reason') and its affinity with an 'open' signifier (the fly), this particular utterance of *(r)eazznM* could be grouped with the signifiers of the 'open' paradigmatic axis. The question remains: should *(r)eazznM* be part of the 'open' or the 'closed' paradigmatic axis? It is likely that this type of dichotomy can only be arbitrated by the construction of meaning out of personal real-world experience: firstly through 'the composer's interpretation of the familiar in relation to our own' (Norman, 1994, p.105) and, secondly, in the listeners evaluation of this interpretation. In other words, both interpretations are possible, depending on our interpretation of reality.

Figure 5 Wishart, *Red Bird*: waveform and graphic score (37:47 – 38:39.7)

V1, V2, V3, V4, V5 represent respectively vocal machine sections 1, 2, 3, 4, 5
I1, I2, I3, I4, I5 represent respectively interludes 1, 2, 3, 4, 5

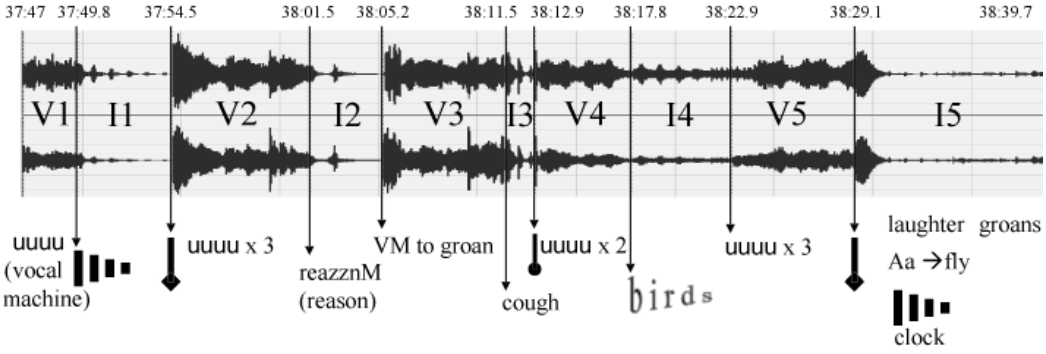


Table 1 Interludes in Wishart's *Red Bird*, 37:47 - 38:39.7

Interlude	Timing	Content
1	37:49.8 - 37:54.5	Iterated high chirp (processed bird?).
2	38:01.5 - 38:05.2	*(r)eazzn* (reason) distorted and spatialised.
3	38:11.5 - 38:12.9	Cough.
4	38:17.8 - 38:22.9	Bark launches iterated bird.
5	38:29.1 - 38:38.7	Metallic bang, clock, laughter, groans. Vocal *aa* transforms into fly.

[18] In another section of this work, the fly is allegorically pursued by book in an attempt to smash it (23:15-24:39). The book itself transforms into the slamming of a heavy door; a strong signifier for closure. Furthermore, the book is identified with knowledge and 'the triumph of reason' (6:38-7:10).

Conclusions

The issues considered in this paper are intended to provide a framework for the discussion, analysis and creation of music articulated in the realm of mimesis. In doing so, it aims to widen the perspectives and panoply of tools available to the musician and to the lay listener for the construction of musical meaning in electroacoustic music. At the same time, I strongly endorse a holistic approach that examines the musical work from a diversity of perspectives of which this conceptual framework will hopefully be a part. This view does not only refer to the parallel use of other approaches, but also to Nattiez's adherence to Molino's view of music as a *total social fact* (*fait social total*) (Nattiez, 1990, p. 42). It therefore advocates the inclusion of poietic and esthesic facts, extra-musical material accompanying the trace such as programme notes and commentaries, historical facts, etc. Furthermore, given the diversity of the electroacoustic repertoire, some approaches may prove more suitable than others depending on the work in question.

Obviously, there are still many issues that require further elucidation; not least, the convoluted multidimensionality of *signifier space*. There is also the need for further examination regarding motion, behaviour and interaction analogous to their conceptualisation within spectro-morphology and space-form. Also, it remains to be seen how this approach fares in more detailed analyses of works.

It is often true that 'an image is worth a thousand words'. But perhaps, one may dare to add that 'sounds *can* be worth a thousand images'.

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