
Mimetic Space – Unravelled

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This article is a development, refinement and expansion of a paper presented at the Electroacoustic Music Studies Conference, 2007 (EMS07). It aims to provide a framework and terminology for the discussion, analysis and creation of music that articulates mimetic discourse and structure. In doing so, it also intends to enable parallel and complementary analytical approaches to those concerned with the aural and spatial aspects of musical articulation. It proposes the notion of multidimensional *mimetic space*, taking as its point of departure Emmerson's *Language Grid* (Emmerson 1986), and constructing additional axes representing compositional continua, similar in function to those proposed by spectromorphology (Smalley 1986), but applicable to mimetic material. The argument considers the mimetic implications of both purely acousmatic music and works that combine the acousmatic with live performance. After a brief consideration of the relationship between mimetic space and space-form (Smalley 2007a), the discussion concludes with a perspective on narrative as a component of mimetic space; providing an extensive discussion of issues pertinent to the idea of *signifier space*, which was originally introduced in the preceding paper.

1. PROLOGUE

The introduction of recording as a means of expression within the musical repertoire enriched the composer's palette through the provision of hitherto unavailable creative possibilities. Amongst these, the strong imagery inherent in *mimetic discourse* (Emmerson 1986: 17) and its potential to immerse the listener in a virtual sonic reality opened new semiotic channels, exploiting human listeners' ability to attribute physical sources to sounds, even when these sources are not visible. As a result, musical works were able to articulate discourse and structure in the realm of the *timbre of experience* (Norman 1994: 107), conjuring new landscapes additional to, and simultaneous with, the listening environment (from the concert hall to private listening experiences), and varying from the physically possible to the surreal and, ultimately, to the impossible. They also embodied new modes of narrative based on our inherent mechanisms of *surrogacy* (Smalley 1986: 82) and the nonlinear character of musical time: these have been compared to the art of the storyteller (Norman 1994), who, in addition to documenting the real world, provides an interpretation of the latter, with further

construction of meaning resulting from the immersion of both the teller and the listener in the fabric of the 'tale'. Together with the availability of recordings of live events, they inaugurated new modes of listening. Furthermore, mimetic aspects affected the relationships between acoustic performance and electroacoustic media, including fixed and live electronic components.

However, while it is true that human beings possess innate mechanisms necessary to construct meaning out of mimetic discourse (as opposed to timbral aspects of sound), the product of years of creative practice in this area has uncovered the need for further refinement of the conceptual tools, concerning the now considerable body of work exploiting mimesis. Therefore, this article aims to establish a framework and relevant terminology for the discussion, analysis and creation of music that articulates mimetic discourse and structure. In doing so, it intends to enable parallel and complementary analytical approaches to those concerned with the aural and spatial aspects of musical articulation, asserting that the latter is essential for the understanding of mimetic music at an aural timbral level.

The discussion begins by proposing the notion of multidimensional *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 spectromorphology, 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. After a brief consideration of the relationship between mimetic space and space-form (Smalley 2007a), the discussion concludes with a perspective on narrative as a component of mimetic space; introducing the concept of *signifier space*.

2. 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).¹ 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).

An examination of the Language Grid suggests that there are various levels² 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 spectromorphology (Smalley 1986, 1997). Therefore, it is reasonable to propose that discourse and structure are always articulated at a spectromorphological level, regardless of the region in

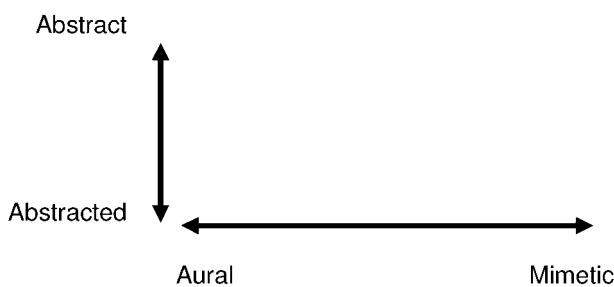


Figure 1. Emmerson's Language Grid.

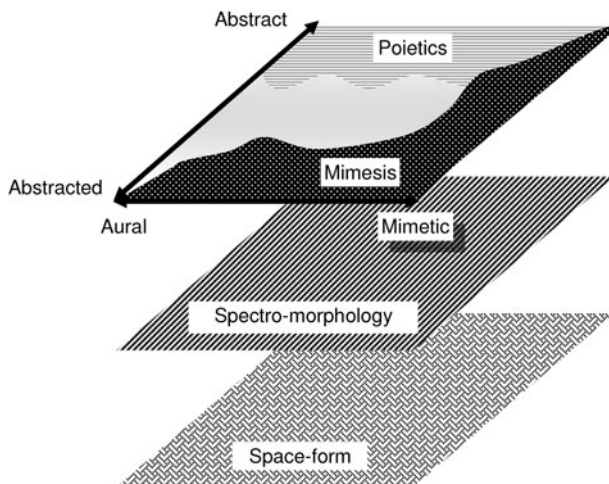


Figure 2. Levels of articulation in Emmerson's Language Grid: although this diagram uses planes to represent these levels, one should not forget that they are multidimensional entities.

¹Given this two-pronged definition, I will use the term 'real-world' (Wishart 1985: 90; 1986: 54; Norman 1996) to refer to the set of materials which can act as sources for mimesis.

²In 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 different perspectives of syntax and structure.

the Language Grid articulated by a particular work.³ 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 2007a: 56). Poietic considerations also provide important information, particularly through writings, programme notes, compositional sketches and diagrams produced by the composer. This is especially 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 abstract⁴ 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: 119) and *surrogacy* (*ibid.*: 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: 64) on the part of the listener,⁵ 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,⁶ 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 spectromorphological syntax. Alternatively, certain spectromorphologies may result in closer surrogacy due to typology of movement, energetic profiles, etc. (e.g. the profile of 'waves' or 'wind'). The existence of close links between space-form and mimesis will be discussed in Section 4.

3. MIMETIC SPACE

Before we embark on the task of producing an initial sketch of the dimensions within which music is articulated in mimetic space, it is important to clarify the following issues:

- The separation into continua is only illustrative: in fact, as we will see below, there may be degrees of overlap and parallelism between continua.

³This matter may be debated in terms of works which are purposefully not intended to make sonic sense (as opposed to works which intend to achieve spectromorphological coherence but do not succeed in doing so): in this case, poietic and philosophical concerns take precedence. However, one may point out that, in negating spectromorphological coherence, these concerns still define themselves by reference to the latter.

⁴As opposed to abstracted in Emmerson's syntax axis.

⁵As opposed to construction of meaning out of timbral attributes.

⁶Cf. spectral space in Smalley (1997, 2007).

- The use of the term ‘continuum’ does not necessarily imply linearity: while there are obvious advantages in representing some of the dimensions as linear, there are instances where analogies to nonlinear space⁷ are more appropriate (see discussion on narrative in Section 5).

3.1. 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.⁸ In these cases, the syntax is assumed to be contained within a bounded region. However, further examination of the electro-acoustic 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.⁹ 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 (Sound example 1: 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.¹⁰ Furthermore, the pitched graduated continuants appearing later (Sound example 2: 3:25 and 3:33) acquire 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.

At 6:37 (Sound example 3), the gradual emergence of a human environment made of vocal utterances opens a new window into the mimetic, playing a role in the articulation of aural–mimetic relationships as the piece progresses: after it disappears into mainly noise-based aural material, a subsequent emergence of pitched graduated continua at 7:51 gradually begins to resemble the morphology of speech (Sound example 4). Regardless of whether one (rightly or wrongly) suspects the effect of particular techniques such as vocoding, the point here is that the preceding emergence of mimetic material (i.e. speech) has an effect on the musical meaning of aural sounds; introducing ambiguity by connecting it to vocal utterance. The same may be argued about the section between 9:34 and 11:48 (Sound example 5), consisting of slowed-down unstable pitched continuants containing vowel-like formants (‘ee’, ‘oo’, ‘a’, etc.): it is reasonable to assume that the surrogate link to vocal formant recognition would have not been feasible if the actual vocal utterances had not appeared before. In this passage, vocal utterances are also linked to train imagery by means of the sporadic interruptions of noise material resembling the sound made by passing trains. Further links are established at 11:05, when the vowel-like pitched material acquires a faint similarity with the Doppler shift of the spectral trajectory of the train horn.

The surrogacy processes related to train and vocal material are strongly reinforced by the appearance of the following mimetic window, consisting of the environment of a train station (11:48). Here, the listener is overtly reassured of the imagery of transport and travel by the foreground calls from announcers confirming that it is indeed a train station. This is reinforced by means of a new allusion to the train horn emerging in the background at 12:17. The section ends with an announcement similar to an airline call, which is drowned at 12:33 by the swelling of a graduated continuant with a wide bandwidth that narrows into a high-frequency component, not unlike the spectro-morphology of a passing jet engine. The latter acts again as bridge and transformation process between the previous mimetic scene, and the totally aural nature of

⁷Two analogies from physics are curved relativistic space and ‘curled up’ string theory dimensions such as Calabi-Yau spaces (cf. Greene 2000: 207–8).

⁸For 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.

⁹Therefore, while it may be argued that the aural does not strictly belong to mimetic space, musical articulation in the aural–mimetic continuum forces the former to refer to the absence of mimesis and thus attribute significance to the level of surrogacy and the feasibility of source bonding processes within the context of a work.

¹⁰Whether the graduated continuant is indeed the result of time-stretch processing is irrelevant in this case.

the pitched continuum into which it is prolonged, ending in a fade out. There are many other instances of the interplay between the aural and the mimetic in this work, such as retrospective connections between recordings of a human environment featuring steps at 14:02 and aural material with similar rhythmic organisation occurring previously in the piece (e.g. 7:25 onwards). Finally, the aural–mimetic implications of the ubiquitous iterative pitched beep also deserve close attention insofar as it may be just an iterated note or, alternatively, reminiscent of the sound of a machine or a reversing vehicle.

Risset's *Sud* is another instance of a work which articulates the aural–mimetic continuum. For example, the first three minutes of the first movement consist of a transition from purely mimetic discourse (surf, birds) to the purely aural discourse of the beginning of the following section at 2:50. Along the way, sounds are processed progressively, fomenting ambiguity as a result of an increasingly remote degree of surrogacy, which nevertheless maintains the spatial configuration akin to natural distributions of bird and insects.

3.2. Phonographic-constructed continuum

A detailed description of phonography (related terminology includes *soundscape composition* and *acoustic ecology*) is beyond the scope of this paper.¹¹ 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: 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).

The contrast between discovery and invention, or the degree of intervention of the composer provides another dimension for the articulation of mimesis. It should be noted that intervention or discovery may happen

whether the syntax is abstract or abstracted. Therefore, while there may be a consequent degree of overlap or parallelism between this continuum and Emmerson's syntax axis (not unlike spectromorphological correlations between gestures and attack-decay archetypes, or textures and graduated continua), they are nevertheless different. For instance, it is possible to have phonographic material following an abstract plot, such as an arbitrarily structured stroll through a series of landscapes, or a particular splicing and mixing order of the recordings. Conversely, constructed works may rely on syntax abstracted from mimetic or aural properties of their material (e.g. syntax based on the sound of a river and rain as agencies of water; or as spectromorphologically similar due to their noise content and potential textural functions).

There are now numerous works that are articulated in the proximity of the phonographic extreme of the continuum.¹² However, there are also works that move through wider ranges of the continuum.¹³ For instance, Norman's *People Underground* (1991) 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 [Sound example 6]), 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 [Sound example 7]), surreal reverberation (e.g. 4:08–4:28 [Sound example 8]) and intentional interjections of silence (e.g. 8:41–9:08 [Sound example 9]), which are particularly poignant in view of the overall reverberant ambience.¹⁴ 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 (Sound example 10), 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.

¹²For instance Levack Drever's *Phonographies of Glasgow* (1999), *Phonographies of Exeter* (2002) and *Sound-Marked: Frankfurt* (2002).

¹³Curiously, recent remarks concerning a phonographic work par excellence (in fact, a pioneering work in this genre) shed light on the articulation of this continuum: Smalley comments on his discovery of space-form construction in Luc Ferrari's *Presque Rien No. 1*, reporting that he was 'surprised to find that it is bristling with spatial forms, which do not arise just as natural consequence of the recorded material, but from the ways in which the composer has used the spatial forms' (Smalley 2007a: 54).

¹⁴The reader may also refer to the poetic information provided by the composer in the CD sleeve.

¹¹For detailed discussions of phonography, soundscape and environmental listening, see Westerkamp (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/>).

This is evident in the granulation of the same male's phrase between 0:09 and 0:14, and the slower looping between 25:0 and 31 (Sound example 11). Thirdly, repetition is used as a timbral device; for instance, as a result of the spectromorphological alteration of the male's voice through granulation, as well as the repeated echoic resonance of the slow looping.

Lansky, on the other hand, adopts a different approach to construction in *Night Traffic* (1990): while he maintains the morphology of the highway (and with it, some of the acoustic ecology of this space), he modifies its spectral content by means of filters, constructing harmonic progressions on top of the evolution of events in what would otherwise be a more or less untouched soundscape.

Busk (1988), by Virgo and MacDonald, provides another interesting case: although it corresponds to a region closer to the constructed, and despite claims by the authors,¹⁵ it contains striking instances of dynamic articulation of the phonographic-constructed continuum. At an overall structural level, the work progresses from the constructed to the phonographic. The introduction shows only glimpses of soundscapes that will be visited later, which are interrupted by aural electroacoustic material that directs the beginning of this work towards a constructed aural discursive route. However, progressively longer excerpts of street recordings¹⁶ are introduced, with diminishing interference from other material. For instance, the street parade that emerges from 5:04 onwards is occasionally interrupted by other sounds (5:49, 5:55, 6:01, etc.) and the initial looping of the recordings contributes to the preservation of distance from the phonographic; whereas, as the work evolves towards its long conclusion, almost untouched phonographic recordings emerge to dominate the discourse from 11:55 to the end at 15:03.

Obviously, *Busk* also articulates the aural-mimetic continuum, not unlike Dohmont's *Espace/Escape*. However, the converse is more difficult to justify: the shorter duration and anonymous character of the mimetic material used by Dohmont does not allow it to incur into the phonographic domain. By contrast, *Busk* thrives with a street atmosphere, even when it is constructed in combination with aural material. For instance, the passage between 10:21 and 11:19 may be considered to be 'translucent', insofar as the recorded sonic environment is allowed to break out through aural material by means of the intermittent (almost stroboscopic) leaking of drumming and other street music.

One of the most remarkable examples of articulation in the phonographic-constructed continuum is Westerkamp's *Kits Beach Soundwalk* (1989): while the narrative in this work fulfils a documentary function

characteristic of a *soundwalk*,¹⁷ it actually describes the intervention of the composer through processes designed to transport the listener from the recorded location to a constructed imaginary world and back to the original location. Westerkamp describes the use of filtering and equalisation in order to sieve out the background of the city (2:56), zooming into the sonic environment of the surf on the rocks, barnacles and seaweed (3:16), and transformation of this environment (4:03) in order to complement the constructed narrative of dreams. She also draws the attention of the listener to new sounds introduced to represent imaginary objects such as 'tinkling bullets' (6:36), and makes her/him aware of the most constructed passages of this work, such as the introduction of excerpts from Xenakis (7:14) and Mozart (7:51). Finally, Westerkamp announces the return to the city of Vancouver and Kits Beach (8:47), but also makes reference to 'play with the monster'¹⁸ as a possible analogy to the way the composer plays with sound. As a result of the processes described above, the course of this soundwalk is not restricted exclusively to the physical soundscape it documents but also becomes a soundwalk within the imaginary space of the phonographic-constructed continuum. It is also worth pointing out that this work is also articulated in the abstract-abstracted continuum: it has a plot which, although may have been inspired by the soundscape, is obviously not totally abstracted from the latter (for instance, in the dreams about the music of Xenakis and Mozart). On the other hand, most of the material used to represent the images described in the narrative is abstracted from the recordings (as opposed to importing other material in order to serve the abstract plot of the narrative).

3.3. Real-unreal continuum

The power to create virtual spaces afforded by the acousmatic medium has been discussed in detail by various authors.¹⁹ Wishart, in particular, takes as a point of departure the concept of *virtual acoustic space*,²⁰ describing various possibilities for the construction of such spaces (Wishart 1985: 79–80; 1986: 47–9) and the articulation of transitions between these (Wishart 1985: 85–6; 1986: 50–2). Virtual acoustic spaces range from a re-presentation²¹ of reality to the unreal. This range

¹⁷A soundwalk is a subgenre of the phonographic, which documents the artist's movement in the environment. This often includes her/his voice as a narrator. According to Westerkamp, 'the real characteristic of a soundwalk from my perspective is the mediating voice of the recordist' (quoted in McCartney 2003: 93).

¹⁸She refers to the city as a monster.

¹⁹Cf. Wishart (1985: 90; 1986: 54) and Norman (1994; 1996).

²⁰The imaginary space projected by the loudspeakers; as opposed to real existing acoustic space, e.g. a room with speakers (Wishart 1985: 73).

²¹The hyphen is used intentionally to differentiate this from representation, since the sounds are presented as they were recorded rather than by allusion.

¹⁵Cf. CD sleeve: 'Rather than direct the listener to recognition of the music we recorded, our interest lay in the possibilities offered in the transformation of these sounds'.

¹⁶In Birmingham, UK.

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: 80; 1986: 48). This suggests a continuum with *real* and *unreal* in each extreme, including in it the *surreal*. However, it is important at this juncture to recall previous remarks regarding the linearity of continua,²² since it is straightforward to envisage both, a situation in which a real virtual space transforms directly into an unreal space, and an alternative situation where it first becomes surreal and then unreal.

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 (Sound example 12).²³ 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 evanescent presence in a large open space (disappearance),²⁴ 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, chipmunk (*tamias*) calls begin to emerge, while the texture begins to resemble a background of insects and the virtual space becomes a natural outdoor scene. The distant high-pitched chanting at 7:54 (a hunting song of the Aka pygmies of Central African Republic; Calon 2007) completes the transition towards the mimetic/real;²⁵ represented by position 2. At 8:08, the

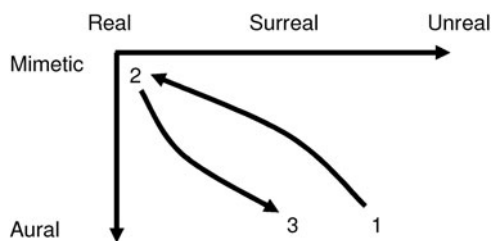


Figure 3. *Le sommeil*, from *La disparition*, by Christian Calon. Articulation in the ‘plane’ formed by the real–unreal and aural–mimetic continua: (1) high frequency gestures and textures (7:12), (2) chipmunks, insects, chanting (7:54), (3) completion of the transition from aeroplane drone to low frequency graduated continuant.

²²See Section 3, second bullet point.

²³Timings are relative to the beginning of the whole piece. *Le sommeil* begins at 7:12.

²⁴I am grateful to Christian Calon (2007) for his clarification of the original sound sources and their metaphoric significance, including information on the chipmunks and the Aka pygmies.

²⁵Calon’s own remarks regarding the pygmies’ chanting indicate strong metaphoric connotations: ‘Tied to the plane overhead it is here as a symbol of (again) *disappearance* (*La disparition*)’ (Calon 2007).

drone of a distant aeroplane that initiates from the resonance of one of the chanter’s utterances begins its approach.²⁶ Once the scene is established, it begins to dissolve through the thinning and fadeout of the chipmunk/insect background, the slight distortion and fadeout of the chanting, 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 level²⁷ 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.

4. LIVE PERFORMANCE: PERFORMANCE SPACE

The introduction of performers focuses attention back towards the physical space where music takes place. Smalley has recently proposed the term *performance space* (Smalley 2007: 41–4), subdividing it into three subspaces²⁸ out of which, *arena space*²⁹ is of particular relevance. In fact, 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: 44). Later on, he 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: 53).

While Smalley’s statements refer to the perception of space *per se*, this has inevitable mimetic implications, since as he himself points out, ‘The idea of source-bonded space is never absent’ (Smalley 2007: 38).

²⁶It is interesting to note the pitch relationship between the sung material and the function of harmonic root assumed by the initial pitch of the aeroplane drone.

²⁷In 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.

²⁸Gestural space, ensemble space and arena space.

²⁹A term borrowed from Emerson, arena space is ‘the whole public space inhabited by performers and listeners’ (Smalley 2007a: 55).

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 (Sound example 13). 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.

At this point, one may question the nature of these functional relationships when the physical arena space in which the performers operate is absorbed into the acousmatic. In other words, what happens when we hear a *recording* of a live performance, which includes performers as well as loudspeakers?

Smalley has pointed out that ‘We are faced, in listening to such a recording, with the problem of not being able to differentiate the arena of the performed space and the space(s) of the acousmatic image (or their

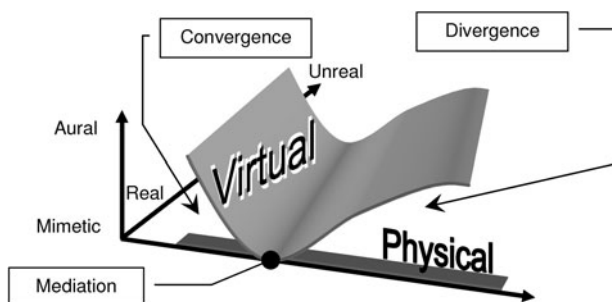


Figure 4. A schematic view of the temporal relationships between the virtual (acousmatic) and the physical arena in *No Me Quedo ...* (12:51–13:46).

relations), compounded by the fact that we listen to the recording in a second arena ... So the ‘real’ experience of space-form/performed space is not transmitted. A bit of a problem for us all in getting to grips with the space of live works if we do not experience the ‘live’ directly’ (Smalley 2007b). This is indeed an additional shift in our perception of recorded sound. However, one should not assume that listening would be identical to that of a purely acousmatic work. Given the fact that most of the ‘live’ music we listen to today is actually recorded, it is not unthinkable to suggest that when a person listens to a recording or broadcast of, say, orchestral music, (s)he invests this with a ‘live’ presence which happens to be transmitted through the electronic medium (as opposed to music that is actually designed to be performed by loudspeakers). As long as the listener assumes that it is a recording of a live performance, (s)he listens to the music in a different mode, probably somewhere between totally live and totally acousmatic. This issue in itself merits extensive study. However, we can already imagine the additional semiotic channels it makes available to creators. For instance, in anticipating the possibility that a work may be recorded, a composer may mimetically articulate the music by exploiting a region of uncertainty around whether sounds are produced by live performers or by electronic means.³⁰ In fact, music for live performers and electronics designed for playback through personal loudspeaker systems has already been produced for many years in the popular music industry: in many cases, live performances by the same artists cannot match studio versions.

5. SPACE-FORM AND MIMESIS

In the previous section I argued that the perception of space has mimetic implications. However, the reverse is also true: mimesis will inevitably create a sense of space, since the real-world we know is three-dimensional and aural recognition of the latter implies recognising a space within which it exists. Therefore, musical articulation in mimetic space is inextricably linked with space-form, and *source-bonded space*³¹ in particular; for in order to create virtual landscapes the composer refers to actual space, whether the landscapes obey its characteristics or contradict them. For instance, unreal or surreal virtual spaces may be realised acousmatically by

³⁰This type of articulation is isomorphic to the exploitation of the aural–mimetic continuum (described in Section 3.1) and might, in some cases, overlap with the latter. However, it is not identical: while aural–mimetic articulation applies to general human surrogacy mechanisms, the current situation is one where the listener has to apply a further level of refinement, differentiating whether mimetic sounds presented through the loudspeakers are those originally produced by live performers or not. This is not a purely psychoacoustic issue any longer: it also has social and cultural implications.

³¹Smalley (2007: 38).

manipulating *perspectival space*³² in order to contradict behavioural expectations of physical space: the spatialisation and mix of singing and orchestral playing between 15:01 and 15:50 in Dhomont's *Chiaroscuro* (1987) is an example of this type of manipulation.

Furthermore, the physical connotations of spectral space, such as scale, height, depth, gravitation, etc. (Smalley 2007a: 45–7), suggest further links; this time between spectral and mimetic space: for example, the use of a rumbling sound with low frequency content in combination with mid-high frequency gestures in order to indicate shaking ground, or a high frequency canopy to suggest a thin gaseous presence.

6. 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: 89; 1986: 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: 91; 1986: 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: 8, 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: 91; 1986: 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'³³ (Nattiez 1982: 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, there is a difference between spectromorphological and narrative webs of meaning. While

the former may be 'neutralised' semiotically³⁴ through agreed typologies, morphologies, profiles and behaviours, the latter are intimately related to personal real-world experience through 'the composer's interpretation of the familiar in relation to our own' (Norman 1994: 105) and in the listener's evaluation of this interpretation. This implies a leak of the poietic (i.e. the composer's interpretation of the familiar) and the esthetic (i.e. the listener's own interpretation), which resists 'neutrality'. In order to illustrate this, I will discuss possible networks of mimetic 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 (Sound example 14). Also, in its third appearance, the 'vocal machine' morphs into a groan.

This segmentation suggests a paradigmatic axis consisting of 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 take 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: 92).³⁵ Therefore, assuming the machine to be representative of closed, rational conceptions, we can note that interludes 1, 4 and 5 are related respectively by means of the mechanical iteration of the sonic material of the artificial chirp, the bird call and the clock; all with a very

³⁴Spectromorphological concepts may be considered to be neutral (or, at least, 'neutralised') from a semiotic point of view, since they provide reasonably objective means of describing sonic events independently of esthetic concerns: for instance, once one agrees that a spectral change from low-frequency to high-frequency content is considered to be ascending motion, other instances of this phenomenon will also fall within the 'ascending' category. Admittedly, spectromorphological definitions are 'culturally conditioned'. However, this is not unlike Nattiez's consideration of 'acoustic definitions' in order to elucidate the concept of noise from a neutral point of view (Nattiez 1990: 46). Also, borderline cases where events such as changes in frequency content may occur at the limit of perception, or become offset or masked by other spectromorphological phenomena do not contradict this neutrality: in the case of perceptual limits the problem is one of resolution (i.e. at certain resolutions there is no movement, in which case one can decide on a particular resolution). In the case of offset or masking, it is a matter of deciding which phenomenon takes precedence in defining the spectromorphology of the event by proposing hypotheses that can then be corroborated or refuted according to further findings during the analytical process (this is in line with semiotic methodology which continuously tests its own hypotheses; cf. Nattiez 1982).

³⁵The ensuing discussion assumes some familiarity with Wishart's description, which would be too extensive to include in this article.

³²The relations of spatial position, movement and scale among spectromorphologies, viewed from the listener's vantage point' (Smalley 2007a: 56).

³³For a discussion of the use of paradigmatic axes in conjunction with spectromorphology for neutral analysis of aural electro-acoustic music, see Fischman (1995; 1997).

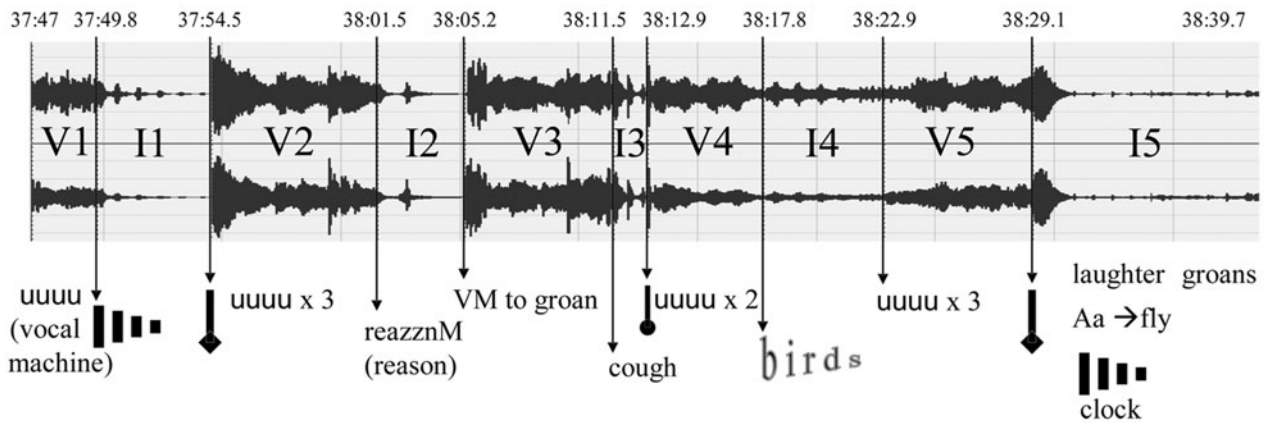


Figure 5. Wishart, *Red Bird*: waveform and graphic score (37:47–38:39.7). V1, V2, V3, V4, V5 represent respectively ‘vocal machine’ sections 1, 2, 3, 4, 5. I1, I2, I3, I4, I5 represent respectively interludes 1, 2, 3, 4, 5.

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	(<i>r</i>) <i>eazzn</i> (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 <i>aa</i> transforms into fly

similar tempo. At the same time, the relationship to birds and free flight pulls this group away from the mechanical and the closed conception, suggesting a different axis than that of the ‘vocal machine’.

The remaining sounds include the distorted utterance of the word ‘reason’, human bodily sounds (cough, groans and laugh), and a vocal ‘aa’ transforming into a fly. These could be grouped into the same axis according to the criteria of sounds originating in the human body (including the fly). However, things get more complicated here: some of these sounds could be considered to represent ‘the closed’ and others ‘the open’. For instance, the last interlude could be conceived as a scene whereby a human representative of a closed political system (laughter) inflicts pain (‘aa’, groans) on other beings. The latter become opposites to the closed system by virtue of the act of repression (even if there is nothing to indicate that they actively represent an open system). In this context, the clock becomes the backdrop against which the closed system operates and the fly becomes a caricature of free flight and openness.³⁶ Following this reasoning, the second interlude could be grouped with the signifiers for ‘closed’, since it alludes directly to

‘reason’ and, by inference, to the ubiquitous phrase ‘listen to reason’. Likewise, the third interlude (cough) is associated with inflicted pain. This leaves us with the three paradigmatic axes listed in Table 2, which constitute the passage’s signifier space.

However, there are other plausible alternatives for the construction of a signifier space for this passage. In the first place, we may note that it is possible to place the origin of the iterative chirp of ‘interlude 1’ with a bird sound iterated at the same rate in ‘vocal machine 1’. In the second place, the process of transformation into a groan may be separated from ‘vocal machine 3’, by pinpointing it as a morph between a bird sound that emerges from the ‘vocal machine’ and the female groan. In other words, the bird escapes the closed system to oppose it. In the third place, the distorted utterance (*r*)*eazznM* emphasises the buzz of a fly through the repeated extended ‘z’, indicating an affinity with the insect featured in ‘interlude 5’. Therefore, we can now group the iterative chirp in ‘vocal machine 1’ and ‘interlude 1’ with the bird to groan morph in ‘vocal machine 3’, the cough of ‘interlude 3’, the iterated bird of ‘interlude 4’ and the groan in ‘interlude 5’, leaving the fly out of this axis. However, if we accept the transformation of bird into female groan in ‘vocal machine 3’, we can use a similar reasoning to argue that: (i) (*r*)*eazznM* emerges from the ‘escape’ of the phonemes ‘*Re*’ and ‘*M*’ from ‘vocal machine 2’; and

³⁶In another section of this work, the fly is allegorically pursued by a 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).

Table 2. Signifier space in Wishart's *Red Bird*, 37:47–38:39.7.

Section	Axis 1	Axis 2	Axis 3
1	Vocal machine 1		
Interlude 1		Iterated chirp	
2	Vocal machine 2		
Interlude 2	(r)eazzn		
3	Vocal machine 3		Groan
Interlude 3			Cough
4	Vocal machine 4		
Interlude 4		Iterated bird	
5	Vocal machine 5		
Interlude 5	Laughter		Groans
	Clock	↔	aa → fly

Table 3. Alternative signifier space in Wishart's *Red Bird*, 37:47–38:39.7.

Section	Axis 1	Axis 2
1	Vocal machine 1	Iterated bird (+chirp)
Interlude 1		Iterated chirp
2	Vocal machine 2	
Interlude 2		(r)eazzn
3	Vocal machine 3	bird to groan
Interlude 3		cough
4	Vocal machine 4	
Interlude 4		Iterated bird
5	Vocal machine 5	
Interlude 5	Laughter	groans
	Clock	aa → fly

(ii) the distortion of the original word ('reason') confirms its subversive status *vis-à-vis* closure; not unlike the groan. Therefore, (r)eazznM (and consequently the fly) may also belong to the previous paradigmatic axis.³⁷ We can now construct an alternative signifier space, listed in Table 3. It is worth observing that, in addition to changes in the content of the paradigmatic axes themselves, this signifier space has one dimension less than that proposed in Table 2 (two paradigmatic axes instead of three). Also, the latter involves a shared element in two axes (the clock), which suggests non-parallelism: cases where there are two or more common elements could be conceived as a sort of 'bending', 'non-linearity' or 'intertwining' of the axes.

Another complication of signifier space relates to Norman's argument that mimetic ('real-world') music reverses some of the processes involved in the construction of meaning: the dual existence of a recording as sound presence and the recall of temporally distant experience, and our empathy with the 'teller's [i.e. the composer's] public "remembering" of events', lead her to the conclusion that while 'In the present, our perceptions precede our evaluation of experience ... Memory reverses the progression: the vestiges, largely

intuitive or emotional, of the remembered experience, and our personal evaluation of this, precede an inward reconstruction of the perceptions which engendered it' (Norman 1994: 108). Finally, she also argues that constructed meaning is changed by time and personal experience, since memory itself changes as part of a dynamic process: 'the recording [of an event] acts as an *aide memoire*, but in fact it may significantly change our memory, particularly on repeated listenings, as we correct or "update" our experience and deepen our listening attention ... The ability of recordings to change or inform our memory of the "truth" becomes the vehicle for a performed transmission of a personal interpretation' (Norman 1994: 108).

As a result of these considerations, the regimentation of signifier space into continua becomes difficult, not only because the degree of multidimensionality (e.g. the number of signifiers corresponding to particular paradigmatic axes) varies from work to work – and in some cases from listener to listener – but also because of the complex intertwining between these signifiers, which suggest something other than simple Cartesian spatiality. This issue deserves serious multidisciplinary³⁸ investigation, which is beyond the scope of this article.

³⁷It is also possible to argue that they deserve their own ambiguous (i.e. neither open nor closed) axis.

³⁸For instance, through collaboration with experts in psychoacoustics, psychology and linguistics.

7. CONCLUSIONS

As stated in the introduction, 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; introducing the concept of *mimetic space*. 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 (e.g. spectromorphology, Meyer's implicative analysis,³⁹ space-form, etc.), whether they are based on traditional assumptions of the interaction of taxonomies or espouse different premises,⁴⁰ but also to Nattiez's adherence to Molino's view of music as a *total social fact* (*fait social total*) (Nattiez 1990: 42). It therefore advocates the inclusion of poietic and esthetic facts, extramusical 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 multi-dimensionality of *signifier space*. There is also the need for further examination regarding motion, behaviour and interaction analogous to their conceptualisation within spectromorphology and space-form. For instance, one may consider whether the idea of gravitation is applicable to mimetic points of attraction within the various dimensions of mimetic space. Also, it remains to be seen how this approach fares in more detailed analyses of works. Nevertheless, it is hoped that the current discussion will contribute to the understanding and knowledge of the wealth of sonic imagery characteristic of mimetic discourse.

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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