

#6

MULTI-FORM VISUALIZATION: A METHOD TO COMPOSE ACOUSMATIC MUSIC

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6.1 Introduction

In acousmatic music, the sonic realm, traditionally qualified as immaterial and ungraspable, is manipulable and concrete, thanks to Schaeffer's (1966) examination of musical listening and the factors of psychological conditioning that influence it. The composer's practice of sound recording, and her ability to intervene in the structure of sound in ways that transcend the actual physical process of sound production and its sound source, challenge the instinctive and natural tendency to draw connections between sonic and visual stimuli. When the actual physical sound sources are absent and sound is apprehended solely through loudspeakers, the listening experience becomes acousmatic. In this exposé, an examination of the perceptual process allows us to examine the perception of qualia in music. I then demonstrate how conceiving the perceiver's mind as embodied is key in the development of my compositional practice, which is based on the idea of a multiform visualization.

6.1.1 The perceptual process

The process of perception is complex and has relevance to philosophy, cognitive sciences, anthropology and geography. The primary sense of proprioception which, through continuous sensations triggered by the muscular activation of the body, helps us to be aware of our physical existence as organized entities. Therefore, perception is a first person experience (Lamedica, 2014) and the perceiving body is the origin of an ego-centred system of coordinates that evolves in an environment (De Monticelli, 2013). Delivery of information from our sensory apparatus, such as kinaesthetic sensations, makes us con-

scious of our position within the environment such that we can actively explore the world around us.

According to Fugali (2013), the sensation of being physically anchored in the world relies essentially on touch, which is *exteroceptive*¹ and *interoceptive*². That is to say, touch is both outwardly and inwardly oriented, providing information about the world's material features and an awareness of our bodily posture, balance and inner condition. The perspectival way we gain access to the world—determined by the dynamic interaction between our sense organs and defined as the mobile parts of the sensory system—shapes our perceptual experience (Gibson, 1983).

The lived environment provides us with different forms of stimuli that we generally define in regard to the different sensory modalities that characterize our body: visual, aural, tactile, olfactory or gustative. Our sensory modalities represent the different channels through which information emitted from the physical environment is received by the perceiver. Once information has been processed, the perceiver, in turn, sends a bodily response to the environment through one or several sensory modalities. Therefore, the perceptual process can be defined as interactive. Gibson (1987) considers perception as a direct, mutual and continuous relationship between an organism and its environment. The complexity of our constant interaction with the world around us invites the interweaving of consciously and subconsciously collected and processed information. Thus perceivers constantly adjust their own set of perceptual skills to the features of their environment.

6.1.2 Sensory engagement

Cognitive sciences see the nature and functioning of our mind as mainly determined by our bodily constitution and the way we engage our sense organs in an active exploration of our environment. O'Regan and Noë (2001) conceptualize the sensorimotor aspect of our perceptual process to examine the nature of our sensory engagement. They observe perceptual experience as a mutual co-determining relationship between body and environment and explore the idea of phenomenal feel (Torrance, 2005) through two features: *corporeality*³ and *alerting capacity*⁴. These two properties help to elaborate sensory consciousness. They are based on the skills involved in perception—namely the articulation of specific patterns of sensorimotor interdependence between perceivers' sensing-

¹A sensory modality that is outward-oriented. It turns to an object in the external world or to material features.

²A sensory modality that is inward-oriented. It has a self-reflective structure, which allows the perceiver to be bodily self-aware.

³A feature used by O'Regan and Noë (2001, pp. 939-1031) to define phenomenologically perceptual experience as a mutual co-determining relationship between body and environment. It is a characteristic whereby bodily movements affect how the environment offers information to our sensory apparatus. For instance when I observe a forest from far away or from inside, it is clear that my bodily position influences the way I relate to the forest. From a general perspective, a corporeal quality can define anything that has a body or material existence.

⁴A second feature used by O'Regan and Noë (2001, pp. 939-1031) to define perceptual experience phenomenologically as a mutual co-determining relationship between body and environment. It considers any perceived change in the environment, like the arrival of the rain, as an invitation to take a sensorimotor action and adjust my bodily attitude, for instance by covering my head with my umbrella to continue observing the forest. In this situation, I adapt my bodily position to the environmental change to remain focused on the forest as the object of my attention.

moving body and their environment. But is this theory applicable to acousmatic music listening?

In fact, when I listen to a piece of music, my bodily engagement towards the music in an acousmatic context is fundamentally different to the perception of my multi-sensory environment. The mono-sensory quality of my acousmatic experience—for example, I am listening to music, sitting on a chair in the darkness of the concert hall or in the studio—does not require the use of my sensorimotor skills as much as when I perceive the environment. Instead, it invites me to engage in a mental process and to adapt the focus of my attention through my cognitive skills. In these terms, a helpful way to widen the perspective offered by O'Regan and Noë is to examine the sensory dimension of the perceptual experience and to look at the concept of embodiment to articulate the impact of bodily experience in musical perception. In the context of an acousmatic concert, the corporeality and alerting capacities are not literally applicable to bodily engagement, yet they may be useful when transferred into the cerebral domain, using mental projection.

6.1.3 The embodied experience

In phenomenological terms, embodied experience is achievable in a unique and structured moment of presence. It intrinsically connects the perceived object to the perceiver in an interactive and constructive mediation. I am bodily aware of the multi-sensory structure of my living environment thanks to the inextricable intertwining of my senses rather than by the independent action of each sense organ. The combination of stimuli, either modal (visual, tactile, smell, aural, olfactory) or bodily perceived (proprioceptive, kinaesthetic, vestibular) captured during my sensorimotor exploration and then processed, provides essential information to phenomenally ground the perceiver's body in a *transmodal*⁵ experience and understand the world in which I live. For example, when I look at a flying bird, an active sensorimotor cooperation between sense organs occurs. The capture of supra-modal information (such as proprioceptive, kinaesthetic, exteroceptive ones) and visual information positions my body as a stationary and grounded self while I perceive the bird as a non-self body, moving in the air. Each modality explores the environment in its own style, picking up and pairing multi-modal information. Reflection on how this multi-modal information can be held together in the image of a world apparently coherent, solid and meaningful like our living environment becomes an important way in which we explore the nature of our senses themselves and the way they contribute to our understanding of the world and our place in it.

The notion of embodied mind is conceived as relational, distributed over body, brain and environment (Scarinzi, 2014), without being attached to any physical structure. From this perspective, the sensorimotor contingency theory seems to apprehend only partially the whole experience of life because it focuses just on objective instrumental actions without accounting for the non-physical aspect of life experience, which is the organism's subjectivity. Our subjectivity, which gives its unique colour to each of our experiences, is according to Fuchs necessarily embodied (*ibid.*, p. 74), that is to say, conditioned by how

⁵Perceptions in which one sensory modality triggers those of another. For example, sound and vision can provide me with spatial, tactile or kinaesthetic information, whose intermeshing imbues a particular scene, or a landscape, with multi-modal qualities.

our body is shaped and how connections between senses are physiologically constructed. So in relation to the idea that our perceptual experience relies on inner representations of the external world, as enactivism positions, our body determines our subjectivity—the way we singularly interact with the world around us through perception, thought, feelings, desires and imagination. This defines us as autonomous and self-determined selves capable of generating meaning out of our experiential interactions with the world, revealing themselves as an entanglement of objective and subjective experiences. In this regard, understanding the notion of *qualia*⁶ (Godøy, 2006) is key to understanding my compositional method.

6.1.4 Musical perception: vectors of *qualia*

The subjective sensations that accompany sensory experience are referred to as *qualia*. Our perceptual activity, thoughts and feelings as ensured by the constant dialogue between sensory information, practical knowledge and our subjectivity—are all contributory to the emergence of meaningful experience.

Like the world around us, a piece of music is essentially an object in constant motion, composed of intermeshed, sequential, overlapped gestural formations (Godøy, 2006). Our knowledge of the sounding world is rooted in motion, fundamentally based on our sensorimotor skills and bodily experience, which can be interpreted as gesture. In listening to acousmatic music devoid of anecdotal content we can still experience a certain degree of connection to and familiarity with the shaping influences and structures of the environment.

According to Smalley (1997) this could be due to the ability of sounds to communicate proprioceptive and motivating sensations that refer to our personal experience of sounding gestures⁷ through the perception of their spectromorphology⁸.

Perceiving any *qualia* in music relies fundamentally on our body-centred and ecological perceptual behaviour, led by our instinctive tendency to seek coherence and meaning though connection between the unknown and our experiential knowledge of the world. Thanks to the electroacoustic tools available to composers to record, create and alter sounds, pieces of electroacoustic music give listeners the possibility to phenomenologically perceive infinite numbers of *typo-morphologies*⁹ and *spectromorphologies*. The relationship between bodily experience in the living environment and music perception inherently colour the way listeners may experience various *qualia* in musical listening, invoking our experiential knowledge of the physical properties of our living environment.

For example, the perception of *qualia* of motion could give the feeling one is virtually witnessing the making of a bodily gesture of a cellist to create a sound, or that one is observing a dancer moving in space. Following Smalley's thinking the propriocep-

⁶Qualia results from our capacity to feel and subjectively experience the materiality of the world thanks to our embodied mind and the dynamic performance of our senses. They are subjective sensations that accompany sensory experiences. They are personal and phenomenal (Huron, 2006).

⁷Smalley (1997) defines gesture as an energy-motion trajectory which excites the sounding body, creating spectromorphological life.

⁸Smalley (1997) defines spectromorphology as the interactive relationships between sound spectra (-spectro) and the way they change and are shaped through time (-morphology).

⁹The *typo-morphology* has been defined by Schaeffer (1997). It analyses and categorises each sound based on its type and a detailed description of its morphology.

tive sensation of gesture aurally perceived refers specifically to a sonic gesture related to physical sound sources like, for example, the opening of a door or footsteps. Sometimes, the motion perceived is not explicitly familiar and may mislead the listener's understanding of the composer's intentions and also lead her to forge imaginative connections. This is particularly the case when sound materials are abstract and their spectromorphology not 'firmly rooted in known sounding gesture' (Smalley, 1996). The qualia of physical presence are communicated through qualia of distance that can be associated with visual perception of the depth of field—both phenomenologically.

The quale of substance, perceived phenomenologically, is fundamentally based on spectromorphology, and features the proprioceptive sensations of density, mass and texture that relate to very intimate sensations of touch, invoking our experiential knowledge of the physical properties of our living environment, such as liquidity, hardness, smoothness, or ruggedness. The notion of substance also echoes the Schaefferian notion of *facture*¹⁰. However, this category of quale, less abstract than the other quale of physical presence, seems to be more connected to the materiality of our living environment and draws a substantial link to the recognition of anecdotal features, or physical sound sources, triggering mental images that connect instantly to our multi-sensory experience of the world.

6.2 In my practice: the capacity to imagine

The experience of listening to acousmatic music is a multi-layered process. It starts in the aural domain with the perception of sounds, which I generally consider either as abstract or as variably representative or evocative of my experiential knowledge of the sounding world—that is to say, through recognition of particular physical sound sources (like the sound of running water or a voice) or bodily sensations (for example, qualia of motion or substance). Listeners rarely perceive acousmatic music as exclusively abstract, anecdotal or figurative. Their experience is a continuous attunement to their feelings about what they perceive, supported by a constant dialogue between phenomenological features presented by a piece and their embodied mind. As a listener and a composer, I am naturally drawn to acousmatic pieces that feature abstract rather than explicitly anecdotal sound materials, as they engage listeners in a 'feel-relationship' with music based on perception of qualia. This has the potential effect for listeners of immediately engaging their being in perceiving transmodal sensations, rather than calling on a response based primarily on the cognitive process of sound source recognition. When I compose music, I see each project as an opportunity to create a new sensory experience, inspired by mental images based on perceptual experiences—real or imaginary—rather than inspired by the sound materials I have in my sound library or others I may like to record.

From a general perspective, my sources of inspiration are multi-modal—I conceive vision, touch and hearing as channels or containers capable of transmitting similar messages in different ways. That is why my source of inspiration can be as broad as the qualia of vast space, the qualia of the motion of the sea, the vision of darkness, the tactile

¹⁰In the Schaefferian typology *facture* is a criterion to describe the way that energy is communicated and evolves through time. It determines whether the energy of a sound is maintained continuously, iteratively or weakly.

sensation of a fizzy texture, the qualia of violent gesture, and so on. To tackle and implement these mental images into music, my method consists in analysing them through tables of key words, reducing them through sketches to explore how I could feel them through my bodily gestures and associating them with video clips whose observation becomes a way to absorb and remotely feel them. All these methods help me to make them ‘mine’, and to associate them with a spectromorphological design, an element of sound material, a process, a sequence or even a way to structure the form of a piece. The shaping of sound materials, like the visual dimension of my working process, is conducted using this feel-relationship. The sounds I choose and shape also profoundly influence the way I compose sound sequences by triggering new mental images. They emerge in turn from the perception of the phenomenological features of the processed sound materials and the sequences in progress. Therefore my compositional process can be perceived as a constant and recursive dialogue between mental images, qualia and phenomenological features, using the multi-sensory dimension of my bodily experience as an inspirational tool to compose music that is evocative of this multi-sensory dimension of human perception. I call this method the multi-form visualization.

In this very personal way of mapping and projecting mental imagery onto a practical compositional approach, the coupling of mind-body then becomes central to the compositional and listening experience in acousmatic music.

The ability to imagine is essential when the gestures we detect via spectromorphological characteristics are ‘firmly rooted in known sounding gestures’ (Smalley, 1996) or, on the contrary, when the spectromorphology has been so much processed that its initial gestural impetus becomes dissolved, losing all intimate connection it could have with our personal experience of life, we may feel completely detached from a work, ‘as if *observing* invisible phenomena displayed on a screen or in space’ (ibid.). Yet a feature of acousmatic music is that composers choose to deliberately shape a listening experience with no equivalent in the real world, leading listeners to build bridges between phenomenological features of sounds, associated bodily sensations and the mental images they experientially or imaginatively connect to sounds in order to find meaning. Moreover, when no realistic connection can be drawn between a piece and our physical environment, trying to picture a meaningful sound image of it cannot only be based on our bodily experience of the world but must also be supported by our ability to imagine. Indeed, a particular texture, the impression of a gesture, or a particular pitch can invite us to experience a conscious dream (*une rêverie consciente* (Bachelard, 1971)) that progressively influences us and leads us in a flow of thoughts, images, and sensations in our mind. Between daydream and the sensory reality of a piece, this type of reverie comes to our mind as an alternative space, reassuring and open to the world but also intimate: it is a space where the aural sensations communicate sensations through various qualia.

6.3 The use of multi-form visualization for *An Ocean on the Moon*

6.3.1 Building the project

The use and design of visuals in my practice of composition is central. I primarily use sketches—but also images, photos or videos can work together with tables of keywords to

help me in visualizing which sound sources and sonic qualities I should employ in a piece and how I could shape the spectromorphological evolution of a composition over time. For my piece *An Ocean on the Moon*¹¹ (2017), I also employed multiform visualization to stimulate the production of raw sound materials by instrumentalists, giving them the freedom to improvise based on multimedia resources I provided to guide them in the expression of particular qualia.

First of all, *An Ocean on the Moon* is a multichannel piece, composed for a 16-channel sound system that recreates the shape of a dome in order to offer an immersive listening experience. The sea is the central theme of this project. When I started it, my perspective on the sea was very much influenced by all the mental images I had in mind, like the joy of being rocked by the waves, the fear of drowning, the contemplation of its beauty or the experience of living at the seaside. At the start of the project I recorded various field recordings, sketches, videos and photos in order to find an angle to attack my piece. I spent time wandering in the city of Corfu and on the seaside at different times of the day to be in touch with the diverse atmospheres, colours and moods of my living environment at this time. As I accumulated pictures and video clips and repeatedly reviewed all of them, I started to connect each of them to particular keywords, representative of their sensory features and qualia. This led me to build the following table (Table 6.1) gathering these features (some are repetitive), which I organized into two different categories, corresponding to different energetic temperaments expressed by the sea, namely qualia of calm (A) and of violence (B).

However, rare were the moments when I could perceive a continuous violent or calm energy from the beginning until the end of a recording. In fact, the sea movements were very much similar to a breathing pattern, a sort of oscillation between calm and violence. Inspired by my observations, I took a pen, a piece of paper and let myself dive into the realm of my imagination where I reduced the sea to a phenomenon of pure motion. Drawing this line (Figures 6.1¹²) was for me a revealing step because it made me experience proprioceptive sensations that I could relate to a sea wave, like continuity of motion, fluidity, freedom, softness, calm, or impetus of expansion. This led me to consider this waveform as the form of the piece, and furthermore invited me to contemplate how I could consider the temporal and spatial dimension of music in relation to this waveform and how I could integrate the opposition between qualia of calm (A) and of violence (B) (Figure 6.3).

¹¹*An Ocean on the Moon* is an acousmatic piece that explores a maritime theme through the evolution of a soft yet shiny, joyful and destructive instrumental netting texture. A particular emphasis is placed on the diversity of sensations that may overwhelm a viewer in front of the sea, between memories of joyful moments, lonely wandering and sudden fear. This piece is an evocation of visual and kinetic experiences of the sea. Through this project, I studied the rich expressivity of instrumental gestures, sometimes methodically, sometimes impulsively. I also explored composerly gestures, which at each stage of the creative process works from the fluidity of drawn shapes: curved, voluptuous, and sometimes extreme. This project resulted from collaboration with several instrumentalists who performed musical sequences based on visual images and video clips. It was partly composed at the Ionian University, located in Corfu, Greece in the context of an Erasmus+ Exchange and it was completed in the Music Technology and Innovation Research Centre, De Montfort University Leicester, United Kingdom.

¹²The pattern of Figure 1 represents an oscillatory movement between qualia A (black curved line) and qualia B (red straight lines) evolving over time. The x axis refers to time, the y axis does not refer to any sonic parameters. While the curves evoke a cyclic, evolutionary, round and soft motion, the straight lines aim to illustrate percussive, aggressive and repetitive sounds

Sensory features			Qualia	
Drops	Shimmering	Massive	Fragility	Violence
Streams	Fluidity	Round	Process	Danger
Strong	Transparency	Coloured shades	Disorganization	Softness
Rolling	Protection	Curved lines	Wildness	Cycle
Slow	Rocking	Silky textures	Craziness	Caress
Wave	Reflection	Tempestuous	Safety	Sharp

Table 6.1: *Sensory features and qualia featured in the visual materials collected for An Ocean on the Moon*

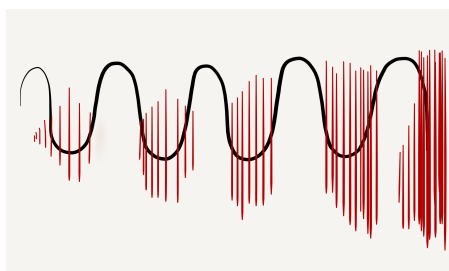


Figure 6.1: *First attempt to represent the breathing cycle of the waves*

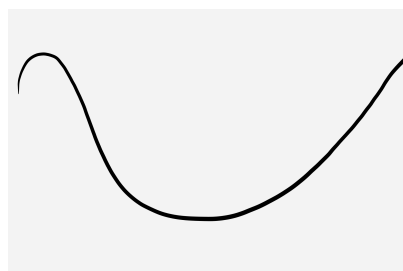
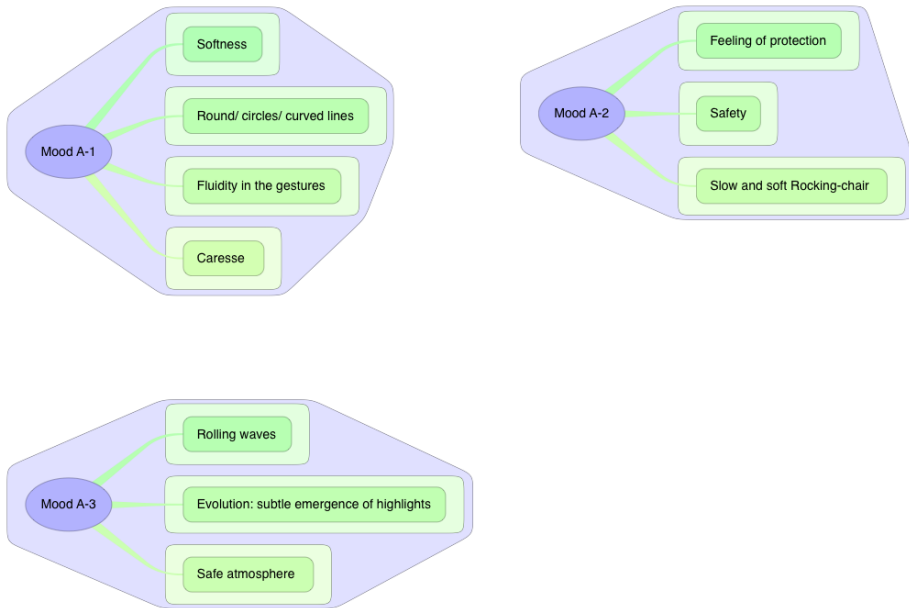


Figure 6.2: *Curved line, resulting from a gesture*

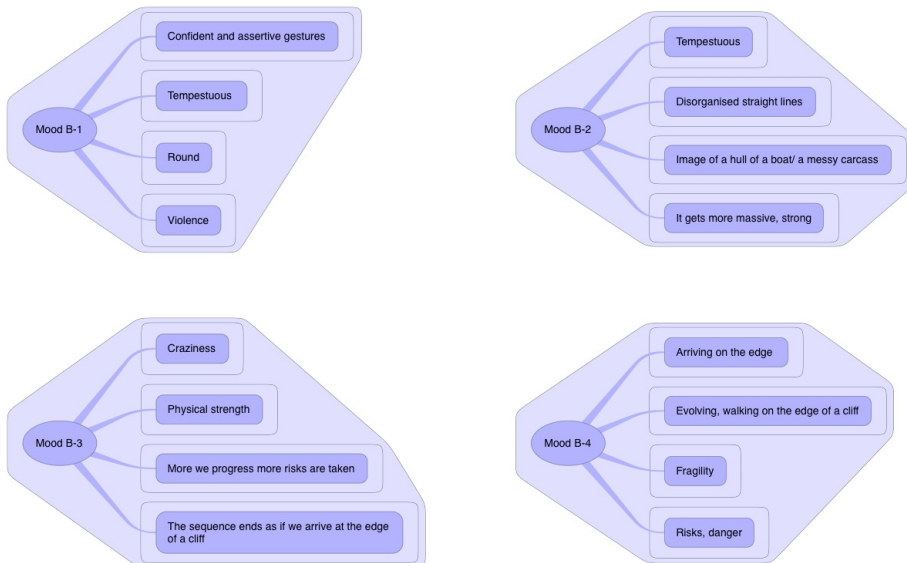
Slowly, the shape, the sound qualities of the piece became clearer in my mind. I imagined a blending of instrumental and vocal sounds that would create various textures, gestures and motions, methodical and impulsive. In this regard, my collaboration with performers was key, as it allowed me to observe and integrate in the project musicians whose sensitive responses to the same multimedia resources and mind-maps of keywords were different. These mind-maps were essentially used as a trigger, and invited them to explore how they could gesturally and sonically embody the mental images, the imaginary or experienced multi-sensory sensations they associated with each mood. Each recording session was individual and consisted of seven improvised performances of 2-3 minutes each. Each resource was related to either qualia of calm or qualia of violence. I divided the qualia of calm into three different moods and the qualia of violence into four.

6.3.2 The structure of the piece

The recording sessions provided me with a significant quantity of sound materials. I created different working spaces in the digital software, called Reaper, that I was using to compose the piece. This allowed me to mix and compose sound clips to see which energy and sound quality would result from this. Then I started composing different textures without applying much sound processing. In this process, I was quickly confronted by different types of gestures regardless of the type of mood. They reflected the greater



(a) *Qualia of calm (A) described as Mood A-1, Mood A-2, Mood A-3*



(b) *Qualia of violence (B) described as Mood B-1, Mood B-2, Mood B-3, Mood B-4*

Figure 6.3: *The mind-maps used during the recording sessions: qualia of calm (sub-figure a) and qualia of violence (subfigure b)*

or weaker fluency of each performer in improvising—some sequences were short, featuring expressive, assertive gestures with a strong sound presence (drums, harpsichord, violin and voice) while other sounds reflected hesitant gestures, a lack of dynamic and not much expressivity. I used this project as an opportunity to explore a new aesthetic and restrict the amount of sound processing to a minimum in order to explore how different instruments could interact with one another and create a surprising mix. To this purpose, I only used a few effects on my initial sound materials, such as noise remover, some filters, pitch, time stretch, and also very little reverberation. Then I started to mix these different sequences on Reaper, testing different spatial positioning and automating different motion trajectories with Zirkonium¹³. I was also very much influenced by the performer's gestures I could hear within the mix. While it was necessary to abandon some sequences—because of the way I designed some movements or because their combination with others did not convince me—I was satisfied with others because I could clearly associate them with specific qualia. For example, the combination of different timbres, pitches and gestures¹⁴, in some sequences managed to transmit the vision of the shimmering and moving surface of the sea, shiny and colourful.

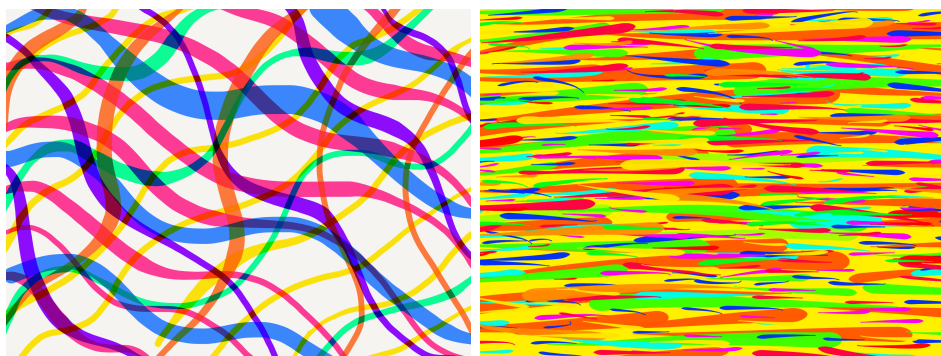


Figure 6.4: *Different textures imagined before starting to record the improvised sequences (horizontal axis refers to time)*

This stage in my compositional process was particularly exciting. The sound sequences I obtained invited me to intuitively rearrange the initial structure (Figure 6.2¹⁵) and refer back to the initial waveform (Figure 6.1) to propose a new structure based on this curved line. Following the idea of a flowing gesture, the new structure imaginatively describes the deployment of the energy-motion of the waves through time. I illustrated this perspective visually through four sketches corresponding to the final four-part structure of the piece (Figure 6.5), exploring the dichotomy between qualia A and qualia B. I used this presentation as a guide to achieve the composition of this piece. The colours

¹³Zirkonium is a digital interface employed to spatialize sound.

¹⁴An example: An Ocean on the Moon (from 0'40 to 1'44)

¹⁵Figure 2 is a reductive representation of my mental image of the sea, its temporal motion.

used in the figures aim to illustrate the diversity of instrumental timbres I would like to use in these different sections. I chose these colours for their visual aestheticism, away from any synaesthetic purpose.

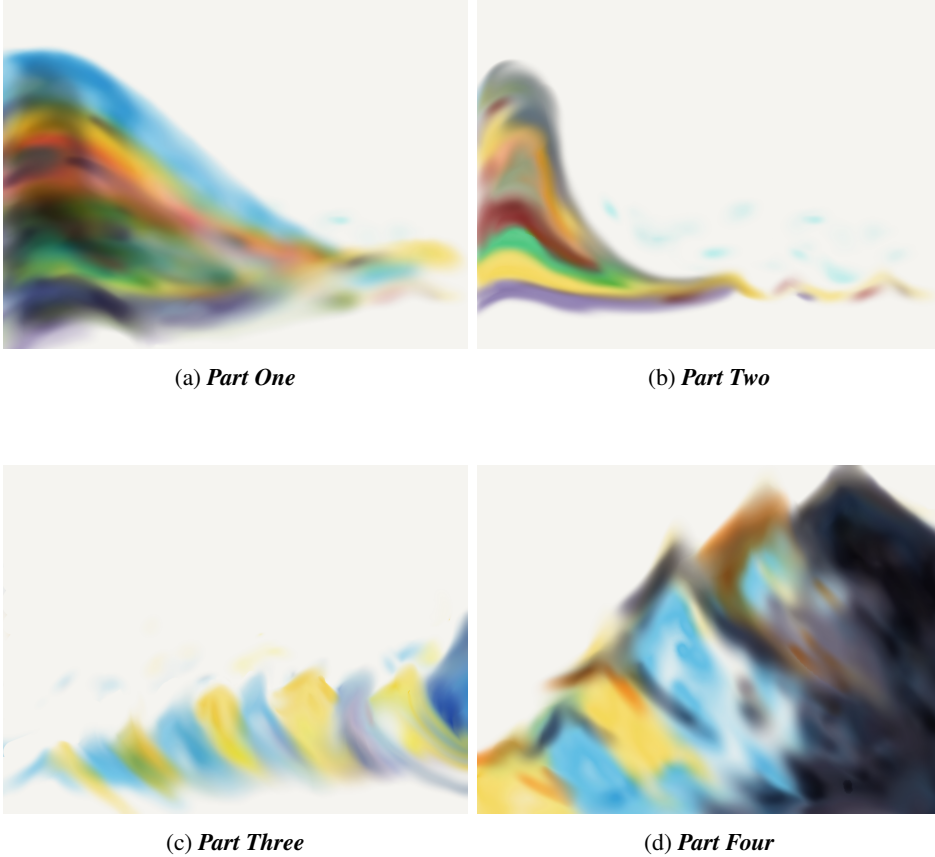


Figure 6.5: *Proposal of structure of An Ocean on the Moon*

6.3.3 The spatial composition

I tackled the spatial composition of the piece as I went along by mixing and composing the different textures with a clear idea of which proprioceptive sensations I wanted listeners to experience throughout the piece. Accordingly, I designed the start of the piece with sparse sounds giving the sensations of sparkles of water drops that would come from the sky. Falling randomly on us, these sounds would progressively accumulate to create a sonic texture that would immerse us in a sound bath, marking the beginning of our journey into an imaginary sea world, made of gentle and sharp rocking movements, some

voluptuous gestures that evoke sea streams, and even unpredictable spatial trajectories of some elements.

The Table 6.2 synthesizes all the features that inspired the final version of the piece. It is a guide that helped me to complete the composition of the piece. It combines the structure proposal, a summary of the mental images that emerged while I was listening to and mixing the recordings—which part corresponded to which quale (A or B), how the notion of knitting, texture and the quality of the sound mix have been thought through, and finally, how I conceived the work's general spatial composition.

6.4 Conclusion

Multi-form visualization is a powerful method to assist composers of electroacoustic music in their creative process by forming essential reductions of imagined sound into something that can be embraced and extended through direct auditory sensation in the studio, as a stimulus for production, an aid for the processing of raw sound materials and also as a guide to building a piece. It is a method I invite composers of electroacoustic music to follow in order to profoundly connect with qualia and also engage in the shaping of sound materials, in such a way that their phenomenological complexity leads to an intertwining of the realms of memory and the imaginary.

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Visual Representation	Figure 6.5 (a)	Figure 6.5 (b)	Figure 6.5 (c)	Figure 6.5 (d)
Mental Images	Sensation of being immersed in a dense and smooth texture	Sensation of release of energy	Upcoming change: increase of energy	Sensation of being in the middle of a tempest
	Mix of sparkles of sounds like drops of water and streams	Increasing sensation of calm and peace	Increasing pace	Increase of violence
	Hot water	Rocking sensation	Progressive change	Danger
	Softness	Airy	Less roundness	Dense texture
	Fluidity	Colourful	Sharper attacks	Sharp sound materials
	High density	Shiny	Sudden emergence of diverse sounds	Succession of heterogeneous textural elements
Qualia	A	A	A-B	A
Spatial Composition	1.Start = pointillist organization of space = one sound = one speaker 2.Then, progressive accumulation of sounds on each speaker: sensation of immersion without major gesture across speakers. 3. End of part 2 : emergence of discrete rocking motion		1. Sensation of immersion 2. Rocking motion across space (forward – backward and left to right motion) is emphasized by presence of wide gestures spread across space	1. Sensation of immersion 2. Combination of different spatial trajectories combined with sudden appearance/disappearance of sound on different speakers

Table 6.2: *Final inspirational guide designed to compose the piece An Ocean on the Moon*

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