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(De)Composing Immersion

Miguelángel Clerc Parada

(De)Composing Immersion

Proefschrift

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I dedicate this work to my parents María Angélica Parada and Miguelángel Clerc Carbone.

Introduction

In this dissertation I explore various perspectives on the term *immersion*, and its relation with, and transformation through, my musical work. I began to use the term immersion to describe in a concise way the type of experience that I felt my music was progressively tending to produce. Therefore, my musical work is taken as the point of departure to investigate on how *immersion* works as a key term to interconnect diverse aspects of musical practice and experience with their various phenomenological and ontological implications.

To develop a musical approach towards immersion I use as a reference model the human experience of diving underwater without the aid of technology. I imagined the relation between diving and listening to music after listening to some of my own works. This reveals the musical origin from which I developed the model. Through this model I found a language to verbalize my compositional concerns which have already materialized in my later works. The phenomenological description of the diver's model derives from my artistic practice and from my experience as a composer/listener.

Underwater

Bodies of water (from oceans to small pools) are part of a diver's environment and physical reality. Before diving, the specific body of water is simultaneously present, and coexisting with the air environment; it is not "another reality" in the same way as, for example, a virtual reality. Only when the diver is underwater, he/she is able to experience the new sensory conditions that result from the fluid medium. The sensory transformations that occur underwater are discovered through the diving experience. But the diver of course also needs to breath. Consequently, the external environment (the air environment, the normal breathing space) is still present, it is only observed through a transformed sensory perspective. Conversely, when the diver fully emerges, the body of water does not disappear and continues to coexist with the environment. Through submerging and emerging, the diver experiences sensory transitions within a reality that appears as multiple and coexisting physical spaces. These experiential transitions affect the diver's sensory awareness. By submerging, the diver feels his/her body exposed to the environmental transformations, because, being underwater, the density of the fluid limits the diver's freedom to move. When emerging from the water again, the diver will experience a temperature change on his/her skin. So, each transition reveals and enhances the diver's perception of his/her resonance with the environment.

In this research project I – sometimes explicitly, but more often implicitly - relate the phenomenological characteristics of this diver's experience to my ideas of immersion through music. The diver's model is thus reflected in my artistic practice and in the compositions from which the model was initially emerging. This reveals a continuous interaction and feedback loop between my artistic practice and the theoretical concepts I use to reflect on this practice. As a consequence, the phenomenological characteristics of the diver's model also describe perspectives and goals of my compositional practice.

The main characteristics that the diver's experience presents and (thus) have led and continue to lead my artistic practice are: 1. A non-dialectical relation between the immersive environment and the surrounding environments. 2. The immersive environment is not perceived as a different or new reality but as a part of a multilayered reality. 3. The experienced transitions expose and amplify the diverse coexisting layers of reality through physical sensations. 4. The immersive transformations and transitions are mainly perceived and understood through sensory perception.

What becomes evident from the above list is that I want to emphasize the importance of the sensory experience, affects and non-referentiality in my compositional practice. With this I do not intend to ignore or neglect other phenomenological and musical aspects that may be present in musical immersive experiences, such as referential elements or cognitive processes. The diversity of cultural backgrounds, personal histories and the diverse factors that condition the listeners' perception of daily life, make that each individual relates to musical experiences in his/her own particular way. To perceive references and to make associations through artistic experiences is unavoidable. My emphasis on the non-referential and sensory characteristics of an immersive experience relate to my point of departure that immersion in music can be achieved by diminishing the critical awareness of apparatuses or media that produce this sensation, such as loudspeakers, computer screens, musical instruments, the environment, etc. I associate the possible recognition of these apparatuses or media during immersive experiences with the recognition of referential and structural elements in music while listening to music. I acknowledge that referential and conditioning elements are always present and at work while listening. However, I will emphasize my interest on non-referentiality and sensory experience as a way of searching for more open musical results.

Composing immersion

As should be clear by now, my point of departure is not primarily on listeners' experiences but on my compositional practice (action) of which listening (perception) is of course an integral part. The composer Horacio Vaggione describes this constant switching between composing and reflection-through-listening as the action/perception feedback loop.

> The composer as a listener is the correlate of the composer as a producer: in order to produce music, an act of hearing is necessary, whether it be the "inner hearing"(the silent writing situation) of pure instrumental music composition, or the "concrete hearing" of electroacoustic music composition. These situations involve variants (there are many others) of an "action/perception feedback loop" which can be defined as an instance of validation proper to musical processes (Vaggione 2001: 59-60).

Here the term feedback refers to the development of the compositional process through time. However, for composers, listening and composing can also be thought of as simultaneously occurring actions. Once the feedback loop starts, it is difficult to establish a strict dual relation between listening and composing. The notions on listening that are discussed in my research project derive from this creative loop and they are contextualized with the help of philosophical literature. My arguments are therefore not primarily grounded on empirical research on listeners' experiences but stemming from ideas articulated in and through my own artistic practice as well as in contemporary philosophy.

Music influences, directs, mediates or otherwise accompanies many of our daily activities and relations to our environments, others and ourselves. In *Everyday Music Listening*, Ruth Herbert explores how music in an everyday context mediates our perception of reality. Her research describes how diverse psychological traits, conscious modes, and perceptual abilities operate in our daily life.[1] Her arguments reveal the flexible and adaptive nature of our consciousness to relate to the surrounding stimuli and also provides evidence to the notion that many perceptual situations that we can describe as virtual, aesthetic or transcending can be perceived within the familiar routines of our daily life. The experience of multiple and diverse shifts and overlaps between virtual and physical worlds is a common part of everyday normality. That is why I insist that, in art, immersion can also be rethought as an aesthetic medium and as an immanent experience that reveals our relation with reality, rather than as a form of transitory transcendence within multiple virtual layers and events. Hence, for me, immanence refers to an aesthetic and multilayered experience that is perceived within the real world. This contrasts with the sense of separation from the physical world and the elevated connotation that is perceived through the meaning of the term transcendence. In this sense, immanence is not thought of as a closing upon oneself, but as an experience of a "singular plural" ontological condition. With this I refer to the main argument of the book *Being Singular Plural* by the French philosopher Jean-Luc Nancy, in which he proposes that being is always being-with, that existence is always or by definition co-existence. From this perspective immersion can be thought of as the experience of "being-with" the world, pointing towards a non-alienated encounter with the world.

Conjointly, through my artistic work I will question the tendency to think about immersion as the experience of a self-inclusive space which is separated from an external reality. I will also reconsider the aesthetic quality and potential that is commonly associated to this separation. I maintain that the physical and sensorial conditions that surround the performance time and space, can be thought of as transitional aspects, causing an overlap between performance time and physical space. From this perspective, immersion can be rethought as a continuous transitional period where different layers of experience interact simultaneously and are thus perceived as an elucidation of reality, rather than as a separation from that reality. Therefore, immersion can be approached as a medium to achieve *dis*alienation, a more or less conscious perception of oneself and of the multiple layers that built reality. I consider this approach on immersion as a creative necessity, and a critical reaction towards the socio-economical and communicational context of art. The physical conditions that surround the performance time and space are essential and basic parameters in my creative process. The relation of music performance with the physical space has a crucial role in my creation of immersive environments. For this reason, spatiality (both physical and virtual) will be a recurrent subject throughout this dissertation. Being aware that this is not a completely new concern, I will argue that when immersion is not thought of as an emulation or representation of the world, but as an actual experience of the world, new aesthetic and experiential results may occur, even when using traditional elements of music creation and performance.

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[1] I will describe immersion and openness as processual models. For this reason I will refer to them as "modes", implying their transitional nature, rather than as "states" which refer to more static and discrete moments of consciousness.

My main goal is thus to propose new insights on immersion through music, where immersion is thought of as a state of being which occurs simultaneously with experiencing other layers of reality and which produces a transparent experience of being-in-the-world.[2, 3] Although my argumentation takes place, first of all, in and through my compositions, contextualizing these new insights will also come from philosophy, e.g. the books *Listening* and *Being Singular Plural* by Jean-Luc Nancy. As mentioned above, in *Being Singular Plural* Nancy proposes that being is always "being-with". "Being-with" is immediately and always exposed through the relation with others. In this way, Nancy argues that existence is essentially *co*existence. I associate this idea with the way people experience their sense of being through immersion in and through (my) music; music is thus presented as "the other" and as a medium for being with the other.

In *Listening*, Nancy explores the phenomenology of "being" through listening. The book opens with the question: "Is listening something of which philosophy is capable?" (Nancy 2007: 1). This question refers to the problem that thinking in a philosophical manner about listening might impose meaning on certain aspects of aural experiences which are beyond discursively articulatable meaning. Nancy refers here to the inherent sensory characteristics of listening. He anticipates the risk of falling into an objectivity that might not always fit with the way we listen.

The main term that Nancy uses to describe his phenomenology of listening, is "resonance". When we listen we resonate; this can be understood as a sense of sharing and plurality. For Nancy, the mechanism of resonance has "singular plural" implications.

> Listening (…) can and must appear to us not as a metaphor for access to self, but as the reality of this access, a reality consequently indissociably "mine" and "other", "singular" and "plural", as much as it is "material" and "spiritual" and "signifying" and "a-signifying" (Nancy 2007: 12).

The sensory experience of listening, as described by Nancy, allows listeners to perceive themselves in resonance with the multiple stimuli of the environment. Listeners "occur" as they listen; we are "being-with" in the experience of listening. Sounds cannot be observed as available *objects*; we listen within the sonic *event*. Nancy proposes that we experience the "*contemporaneity* of the audible" (Nancy 2007: 16).[4] From this point of view, listening always appears as a sharing. The social perspective of the argument of *Being Singular Plural* can therefore be associated with the phenomenology described in *Listening*. The experience of being, described in *Listening*, can be connected to the condition that Nancy imagines as the inherent sense of *Being Singular Plural*.

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[2] "Transparent" refers to a state of disalienation in which a sense of self is clearly perceived.

[3] It is important to note that, when I write in this philosophical context, I do not consider terms such as audience, music, and listener as universal categories nor as empirical entities/realities but rather as linguistic concepts.

[4] Nancy differentiates simultaneity (relating it to a visual phenomenology) from contemporaneity (relating it to an aural phenomenology). This will be explained later in the text.

Throughout this dissertation, these arguments will be developed and associated with my rethinking of immersion and to musical practice, my own as well as that of others. I will also relate immersion to arguments proposed by authors such as Peter Sloterdijk, Frances Dyson, and Salomé Voegelin. Although they all have different approaches towards the relations between humans and sound, the idea of a resonant-subject, the body as a vibrating skin, and listening as an immersive (physical) experience, are some of the ideas that cross over between these authors. Furthermore, Nancy, Voegelin, Sloterdijk, and Dyson all have similar ideas regarding the phenomenological differences between sight and hearing. All of them depart from a viewpoint that relates objectivity to sight, and subjectivity to hearing, where hearing is described as a form of immersion. Reflecting on their ideas, I will not only explore the physicality of immersion from the perspective of musical practice, but also criticize the hierarchical opposition these authors create.

Immersion and openness

Besides rethinking immersion through music, I will present how - by relating compositional processes to the phenomenology of musical performance and listening - the idea of openness can be associated with immersion. Open and mobile works, as for example defined by Umberto Eco, refer to musical works in which the composer leaves specific elements of the work to be completed by performers or audience. In my research, I have studied openness, not in the sense of structural or mobile characteristics of notated musical works, but from a performer or listener’s experience when confronted with open works: what do listeners and performers perceive as open? My focus has been on those aspects of a work which induce a mode of openness, disregarding whether the *formal* elements initially presented in a work are open or not. I thus relate to openness from a composer’s perspective. I argue that there is a correspondence between a listener’s experience of openness and music that induces the performer to consciously achieve an open mode. To contextualize these ideas, I will use as a main reference Eco's *The Open Work*, additional essays, and musical works by others.

Moreover, I argue that the relation between openness and immersion resides in their common lack of rigidity, and that an immersive experience is in itself open. In an immersive experience, a listener has his/her critical awareness and objective thinking diminished in relation to external stimuli. As a result, an immersive context offers an open space containing undefined and multiple sensorial entry points.

As mentioned above, my compositions reveal my primary interest in the non-referential aspects of music. However, this does not mean that, in my opinion, music with clear referential elements cannot be or become immersive. Any musical practice can induce listeners to immersive modes. However, my interest on the non-referential aspects of music points towards a reduction of the possible recognizable elements that may lead listeners to make conscious identifications or specific associations. In this way, the compositional process is approached in relation to the notion that immersion occurs when the immersants lose some critical awareness of the sound sources.

As regards performers, I will emphasize that a score that does not allow for a visual representation of the intended sounds invites the performer to discover the piece only in and through physical actions. This kind of score mainly (re)presents a set of instructions, and not the sonic events that musicians would imagine from a traditional score when they can mentally associate the symbols to specific sounds. Therefore, I propose that invisibility is a form of fixed openness, and openness is the perception of actions without an assignation of an expected effect. The sounding action is perceived as an ontological event, without elaborating on any pre-existing mental interpretation. I argue that this instantaneous experience of the event is a form of both openness and immersion.

Structure

This dissertation reflects the tension that is generated when trying to verbalize a compositional thought which freely, subjectively, intuitively, emotionally and simultaneously associates biological, cultural, political, and phenomenological ideas within the musical practice. In this fashion, the main ideas of this dissertation will be presented from diverse perspectives dependent upon the musical context to which they are associated.

My methodology results from a certain friction between fixed and objective research schemes on the one hand, and more subjective, open characteristics of my musical practice on the other. The research process can be described as proposing a basic set of hypothetical ideas, which, when associated to the musical practice, produce new and diverse perspectives, both on the music as well as on the ideas themselves. Accordingly, the structure of each chapter results from a constant feedback loop between theoretical investigations and concrete musical elaborations. I present the reflections on my own musical works in a chronological order. The first two chapters deal with two pieces written before I started this study. These chapters will reveal how the arguments on immersion and openness, derived from these works, could only be articulated afterwards, as "the right words" to describe what I perceived through these pieces were lacking until I discovered the relation with the diver's experience which led me to look for literature on immersion. So, I retrospectively investigated the immersive ideas and the characteristics of an open work within them. These earlier works reveal how I progressively and intuitively developed musical ideas and contexts that relate to the topics and problems discussed here. The next two chapters deal with compositions created during the research period. Therefore, these compositional processes are experimentations with a clear investigative intention, and they reveal the effects of the context of this research. Additionally, each chapter presents various musical works by other composers to comment, compare, and give a broader context to the arguments proposed.

Chapter 1 considers the phenomenological differences between sight and hearing. This chapter departs from the question "how is sight immersive?", and extends this problem into a musical practice through the question "how can the visual aspects of a musical piece aid in achieving an immersive experience?"

The main goal of this chapter is to argue against the dominant idea that listening can be better associated to the characteristics of an immersive experience than visual experiences. I will claim that sight can also contribute to immersion because of our *introjected* ability to relate to virtual and real images.[5] In this chapter I will also describe how listeners and performers may achieve a mode of openness due to the visual setup of my musical works. Furthermore, I will introduce the notion that a fixed score can induce a sense of openness when it does not offer the possibility of creating a clear visual-to-sound representation. The last part of the chapter reflects on the relation between a performance environment and openness by describing the experiential differences between varied contexts in which the referred piece was performed. The main reference work in Chapter 1 is *What about Woof?* for five percussionists.

Chapter 2 introduces the spatial attributes of an immersive experience. The differences and relations between the virtual characteristics of the musical time-space and a given physical environment are described in relation to a compositional process. The main goal is to show how a compositional process may end in a piece with immersive characteristics as a consequence of the initial intention of creating a musical time-space that is designed in reference to the real physical space.

In this chapter I will also describe how a focus on the surrounding physical context affects my approach towards the use of harmony, timbre, rhythm, dynamics and space. Various aspects of the compositional process of the referred work will be presented in order to demonstrate the effects of composing in concern with the physical space. I argue that there are musical approaches and characteristics which tend towards producing immersive experiences, Chapter 2 concludes with a description of the open characteristics of the work under discussion. The main reference work here is *La línea desde el Centro* for twelve guitarists and a conductor.

Chapter 3 introduces the main ideas behind the composition *Eufótica* for six percussionists and tape. This chapter exposes theories of underwater sound perception. Having the underwater model as an intentional reference, the goal of this chapter is to show how, through the compositional processes and results*,* it is possible to interconnect and further develop the arguments about space, listening, and sight, and their connection to musical practice.

Referring to underwater experiences, *Eufótica* intends to create an immersive environment that is sensed as an extension of the physical reality. The underwater model works as a virtual proposal that can have diverse uses within the musical practice. In *Eufótica* the physics of underwater sound perception are relocated into a musical and compositional space. By performing *Eufótica*, the virtual-spatial characteristics of the compositional model are projected into the physical world as an aesthetic result, more than as an accurate emulation of an imagined environment. This emphasizes my focus on rethinking immersion as an aesthetic event that happens in reality, rather than as the experience of an aesthetic event separated from that reality.

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[5] "Introjection" is a term used in psychoanalysis that is defined as "the unconscious adoption of the ideas or attitudes of others" (Oxford Dictionary). This term is also used to describe the incorporation of practical, psychological, and physical abilities that appear as demanded by the social context. In this way, the term is not necessarily pointing towards the incorporation of specific behaviors of other people, but towards the incorporation of behavioral tools related to a practical adaptation. Rather than finding this term in literature about psychoanalysis, I found it within the book *Semiotics and the Philosophy of Language* by Umberto Eco, where he describes how the way we relate to mirrors is an introjected phenomenon. In this dissertation, I use the word from this phenomenological perspective.

Chapter 4 will encompass all of the issues previously discussed and presented in relation to my ensemble piece *A Bao A Qu*(M), which can thus be regarded as a concise musical reflection of the ideas developed in this research from its own particular musical perspective.[6] By describing this composition, I intend to present the idea of immersion as a multilayered event. *A Bao A Qu*(M) operates with diverse forms of interaction and communication between musicians and conductor, and it considers various layers of sound production in time and space as part of the performance. The goal of presenting these interactions is to show that they are responsible for creating an immersive environment.

This final chapter describes how the sounds outside of the hall, sounds of the audience entering the hall, non-intended sounds during the performance, imperceptible sounds, acoustic sounds of instruments (with all of their dynamic, rhythmic and harmonic connotations), and prerecorded spatially amplified sounds were all considered in the compositional process and thought of as an essential part of the work. All these elements are combined to create a multilayered reality. The description of *A Bao A Qu's* compositional process will serve to understand the musical origin that gives form to my argument about immersion as a singular plural experience. In this chapter I propose that the sense of "being singular plural" is experienced in an open, immersive and musical context, not as the acknowledgement of what it means to be "singular plural", that is, not as a programmatic description nor as an exposition of the condition as it happens through language, but as an actual sonic embodiment of our singular plural condition.

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[6] I will refer to my piece as *A Bao A Qu*(M) to differentiate it with the A Bao A Qu from the story. The M thus stands for music.

Chapter 1

On *What about Woof*?

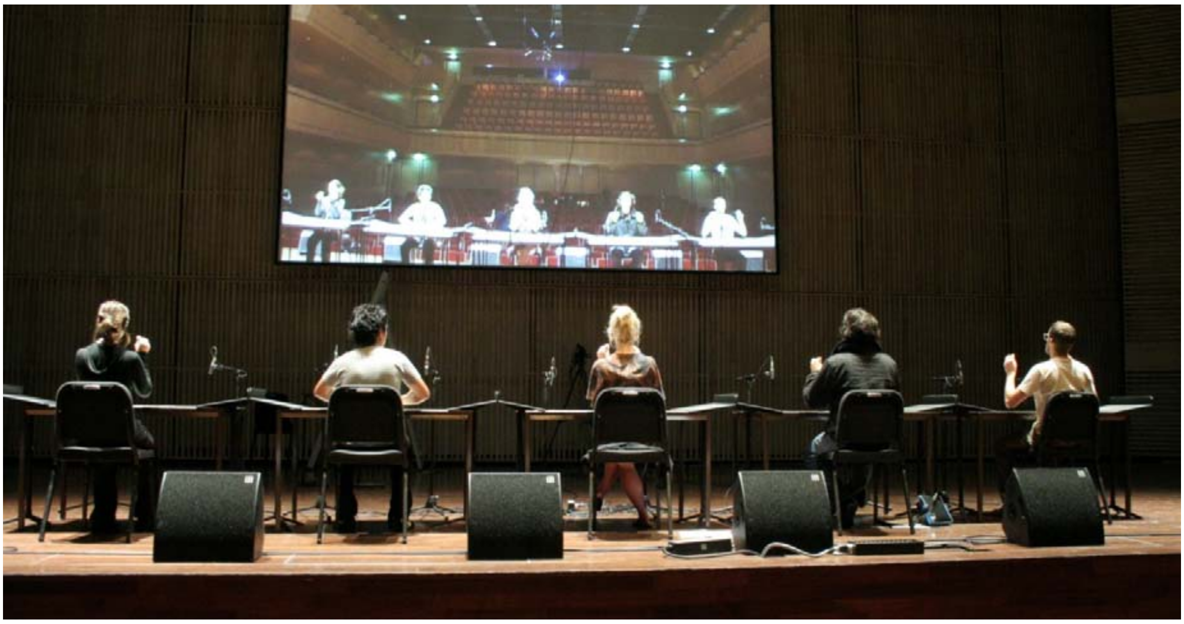

Figure 1 *What about Woof?* Stage setup in Muziekgebouw aan 't IJ, Amsterdam.

1.1 Introduction

What about Woof? is a piece for five percussionists that I composed in 2007. Each musician performs on a table with a rough surface, also having two metallic surfaces that extend beyond the table edge. All of the surfaces are rubbed and beaten with coins. In this work, the performers have their backs to the audience and they are projected on a screen, as seen in Figure 1. The audience cannot clearly identify the objects in the hands of the players. As a consequence, they do not know what is producing the sounds. The timbre of the sound material is homogeneous and because of the rarity of the instruments used it is not related to an instrumental tradition. The sound material could also be described as "noise". The resulting "noises" are always associated with their corresponding physical gesture. This does not differ much from the way other instruments operate. However, in *What about Woof?*, the homogeneous and undefined characteristics of sound, accompanied by a strong visual physicality, encourages the listeners not to focus on the possible associations that can arise from a musical tradition, but rather on the visual gestures of the body. In this visual context, sound aids the listeners to have an embodied perception of the gestures seen.

Does the visual construction of *What about Woof?* aid in creating an immersive context? Is the visual setup an important factor to produce an immersive context? How does the way people use mirrors relate to how they relate to digital or projected screens? From the perspective of research on sound art and philosophy, the following chapter intends to answer these questions by exploring the phenomenological relations and differences between sight and hearing. Later on, I will discuss how people relate to mirrors to contextualize the specific problems that occur in the "mirrored" setup of *What about Woof?*

Further on in this text, the relations between the visual, physical space and open work will be discussed. Open and mobile works, as defined by Umberto Eco, refer to artistic works in which the author leaves specific elements of the work open to be completed by the performers or audience. Having as reference this notion, in this chapter I reflect on the following questions. How does an "open work" relate to the idea of immersion? Are mobility and the resulting transformations from performance to performance aesthetic qualities? How can the notion of mobility be associated to the repetition of *What about Woof?* in different spaces?

Generally, the spatial requirements of a piece need to be flexible and adaptable to the surrounding physical context. *What about Woof?* was performed in several theatres, and each physical space offered new sensorial possibilities. From this point of view, when the audience observes the perceptual differences of a single work in diverse spaces, it is possible to propose that space itself is actually perceived. Perceptual variations occur to different degrees with each repetition of any musical piece. However, the visual and spatial requirements of *What about Woof?* lead the piece to substantially different perceptual results. These results are described in this chapter to emphasize the importance of space and the visual setup in open immersive environments (with these I refer to immersive contexts that are not perceived as a closed or separated new reality).

1.2 Associating sight and hearing: an immersive approach

1.2.1 Thinking from the eyes

In *Sounding New Media: Immersion and Embodiment in the Arts and Culture*, the media artist and author Frances Dyson defines "immersion" as a "process or condition whereby the viewer becomes totally enveloped within and transformed by the 'virtual environment'" (Dyson 2009: 1). In the context of "virtual environments", Dyson refers to immersion as the ability to perceive oneself enveloped within an immaterial (virtual) simulated space. This happens due to the interactive way in which new media operate. "Interactivity—the user's navigation of and engagement with digital content—is said to give users agency, freeing them from the passive experience of simply watching" (Dyson 2009: 2). As a consequence, this interactivity is perceived as "an ontological state or condition" (Dyson 2009: 1). "By 'being in', rather than 'looking at', virtual environments, the viewer is said to occupy the space and time, the here and now, the virtual present of a separate but ontologically real space" (Dyson 2009: 2). The notion of "being-in" is key to understanding immersion as a plural and active experience. However, the quotes above still refer to virtual environments, and within these contexts, immersion can be perceived as a sense of being that occurs within a framed time-space separated from the surrounding everyday reality. These quotes from Dyson appear at the very beginning of her introduction, and they seem to be related only to the visual aspects of virtual environments.[7] In these visual contexts, she describes immersion as a disembodied experience. Later on in her book, she clearly associates the phenomenology of listening to immersive notions of new media.[8] She describes listening as a physical embodiment that operates through immersive traits analogous to the ones she describes as occurring within virtual realities. However, sound is perceived physically and not just virtually. As a result, the sounding aspects of new media render the virtual world as being closer to reality.

Is Dyson, at this early stage of her presentation, only referring to the visual aspects of new media? Paradoxically, she uses the word "viewer", an allusion to the visual, to refer to the subject or immersant. Although she differentiates the active role of the user as a "navigator"[9], rather than as a "viewer", it is still not clear if hearing already has entered into the argument, or if she is taking for granted that the reader will understand that there is sound involved. When people watch television, a movie in a cinema, or look at their computer screens, they would be commonly referred to as "viewers" and not as "listeners" despite the presence of sound. In this sense, it is logical that the reader assumes that "viewer" incorporates sound into its meaning. The raised hierarchal importance given to "viewing" emphasizes our sense of separation from reality.

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[7] Shortly after in her book, Dyson makes clear that the idea behind VR –being immersed, being in – can only take place through multisensory approaches and that ideas of immersion can take their inspiration from sound studies. At this stage of my dissertation I choose to focus only on this fragment to aid me in the construction of my argument.

[8] I will go into more detail on this later in the text.

[9] Despite of this differentiation, Dyson returns to the use of the word "viewer". I assume that this is done for practical reasons and because the reader already understands what "viewer" for the author means.

Sound makes the virtual more real. For instance, when using headphones with virtual media, one is separated from the external sonic environment. In this context, the isolated sounds from the headphones further emphasize the sense of a separate reality within the new simulated space. Sounds are felt as belonging to the new environment.

Assuming that Dyson considers virtual environments with all their multisensory implications, then, the use of the word "viewer" to refer to a subject having a multi-sensory experience elucidates the predominant role of sight in language and history. In the context of the quotes presented in the previous paragraphs, readers can assume and understand that the "viewer" is not just referred to as "the one who looks", but "the one who perceives with all their senses". On the other hand, if the readers focus solely on the visual aspect, which originally defines the term "viewer", then the quotes above become incoherent and contradictory (or readers assume that she is referring solely to visual aspects). However, due to the historical predominance of sight, we naturally borrow words that are associated to the visual to describe other senses. Consequently, we overlook the specific meaning of the word "viewer". Although Dyson acknowledges that sight is the prevailing sense in Western thought, the use of "viewer" in the context of the quotes above reveals the influence and incorporation of this domination. The above contradiction further emphasizes the existence of this tendency.

According to Dyson, the domination of sight came about due to the association between seeing and Being. This association "has been fundamental to the construction of a subjectivity where the eye and I coincide—where vision, abstracted, becomes the ground for all objectivity, certainty, and inspiration" (Dyson 2009: 13). Observing the history of philosophy gives proof of the early development of this notion, and reveals the secondary role of the ear in philosophy until the early 19th Century.[10] In the essay "Wo sind wir, wenn wir Musik hören?" (Where are we, when we listen to music?), Peter Sloterdijk is compelled to describe the sight-based predominance within the history of philosophy, in order to prepare a background from which he develops ideas in relation to the ear and sound[11]:

> In fact, the Western philosophy of light and sight had, in its illustrious days between Plato and Hegel, a rather disdainful relation with the realities of the ear. In terms of its fundamental characteristics, Western metaphysics was an ocular ontology that had its origin in the systematization of an exterior and interior sense of sight. The thinking subject appeared as a seeing being which saw not only things and archetypes, but, in the end, also itself as a seeing soul – a local manifestation of an absolute visual ability. The members of the guild could be described as arguing visionaries (Sloterdijk 2008: 286, my translation).

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[10] Early phenomenological notions opened a new philosophical space.

[11] Beginning a text reflecting on the visual nature of our way of thinking seems to be a necessity in essays that deal with the phenomenological and ontological implications of listening. Philosophy through listening requires one to acknowledge that thought and language mainly have a visual background. The references used from Sloterdijk and Dyson start with this visual contextualization. Later on in the text, I will present more examples of this logic. Although unintentional, this dissertation also starts by discussing sight.

The recognition of the self within the duality of an interior and exterior reality is characteristic of this visual notion. The history of Western philosophy, affected by the visual, led to an increasing sense of separation between the inner self and the exterior world. This separation reaffirmed the sense of individuality and self-inclusiveness of beings and objects. From this point of view, we can assume that visual objectivity, in the sense of recognizing the separation of individuals, and the certainty that arises from it, comes from this historical process.

"Looking at" implies a distance, and a separation that is perceived as an objective dichotomy. In the book *Listening to Noise and Silence: Towards A Philosophy of Sound Art*, the Swiss artist and writer Salomé Voegelin is compelled to explore the nature of sight and its influence in Western thinking to develop a new philosophical approach towards sound art. As in the footnote previously mentioned about Sloterdijk (the necessity to reveal the visual nature of thought), Voegelin describes the phenomenology of sight to give context to her research on sound.[12] In the introduction of her book, Voegelin clearly describes the phenomenon of separation that occurs with sight:

> Vision, by its very nature assumes a distance from the object, which it receives in its monumentality. Seeing always happens in a meta-position, away from the seen, however close. And this distance enables a detachment and objectivity that presents itself as truth. Seeing is believing. The visual 'gap' nourishes the idea of structural certainty and the notion that we can truly understand things, give them names as stable subjects, as identities. (Voegelin 2010: xi)

The phrase "Seeing is believing" summarizes what Voegelin proposes in the above fragment. She is pointing out the certainty-as-thought that occurs due to the distance between the subject and the seen. Also, Peter Sloterdijk reflects on the phenomena that occur due to the visual separation, but gives emphasis to individuation and detachment from the surrounding context :

> In order to see something, the viewer must be at a clear distance with respect to the visible. This spatial separation and opposition suggests the acceptance of an abyss between subjects and objects which, in the final analysis, is not only spatial but also ontological. The ultimate consequence of this is that subjects can be regarded as observers without a world and only have an external relation to that already withdrawn cosmos. Therefore subjectivity, in analogy with a predominantly theoretical divinity, would be primarily contemplative, and only secondarily active. In so far as the world of the eye is a world of distance, ocular subjectivity is inclined to interpret itself in the end as an uninvolved witness (Sloterdijk 2008: 287, my translation).

This quote can be related to Dyson's argument about the acquired subjectivity that results from the historical way of thinking through sight: "… a subjectivity where the eye and I coincide" (Dyson 2009: 13). The "eye" refers to vision as a physical phenomenon prior to the assignation of meaning. “I” refers to the cognitive process and its ontological implications. The subjectivity resides in the abstract relation of the symbols that viewers associate with the seen, and in the objective certainty that they perceive in them. This abstract certainty (ocular subjectivity) is what Sloterdijk refers to as a “global attestation”. However, this attestation is isolated and extracted from the surrounding context. The term “interpret”, in the context of Sloterdijk’s quote, refers to a visual objectivity where the “recognition of the seen”(interpretation) is perceived in its own inclusiveness without having the world as an enveloping reference. To identify (or name) the object seen is to isolate its meaning from the multiplicity of its surrounding visual context. During the infinitesimally short lapse of time of assigning a name/symbol to the seen, viewers may separate the object from its context. For example, viewers can recognize and start thinking of a glass of water on a table despite of the characteristics of the surrounding context. This context influences viewers' perception of the particular characteristics of the object but they are able to name it and think of it as an individual detached from its surroundings.

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[12] Later, I will discuss how Voegelin attempts to approach sound and sight in a complementary way.

From this line of thought, vision can be perceived as an alienating phenomenon, where the individual recognition of objects blurs the viewer’s perception of all of the diverse surrounding phenomena and their interconnections. In this way, to think through vision, leads to the perception that sight is not immersive. However, this seems to be the case only when viewers approach sight in relation to how they ‘think’ about the world. The analogies between how people see and think about the world do not necessarily describe all of the diverse perceptual ways (detached from meaning) in which sight operates.

1.2.2 Differentiating Visual and Aural

> Hearing does not offer a meta-position; there is no place where I am not simultaneous with the heard. However far its source, the sound sits in my ear. I cannot hear it if I am not immersed in its auditory object, which is not its source but sound as sound itself. Consequently, a philosophy of sound art must have at its core the principle of sharing time and space with the object or event under consideration. It is a philosophical project that necessitates an involved participation, rather than enables a detached viewing position; and the object or event under consideration is by necessity considered not as an artifact but in its dynamic production. (Voegelin 2010: xii)

In *Listening*, Jean-Luc Nancy develops his hypothesis of the ontology of listening, using sight as a comparative reference. He states that there is “…potentially, more isomorphism between the visual and the conceptual” (Nancy 2000: 2). This quote refers to the same visual subjectivity described in my previous sub-chapter. “The sonorous, on the other hand, outweighs form. (…) The visual persists until its disappearance; the sonorous appears and fades away into its permanence” (Nancy 2000: 2). Through this, Nancy describes the temporal, dynamic, and ephemeral nature of sound perception. One cannot hold sounds to draw them. Frances Dyson explores this phenomenon by comparing visual objectivity with the subjective phenomenology of listening. To differentiate these two perspectives she presents the following argument by the film/sound-theorist Michel Chion: “Chion’s solution was to think of sound as an event rather than an object, and in doing so to incorporate a sense of organic process, of movement, change and complexity, while maintaining a sense of identity and individuality" (Dyson 2009: 10). A sounding event makes reference to a temporal action where there is an implicit change and movement. The listener, the sound source(s) and the physical space (with all its conditioning characteristics) participate simultaneously in the auditory event. These active and plural qualities that occur during the recognition of sound differ from the individual objectivity that we can assign to visual objects which are available to be seen. We decide when we look. We perceive sound as it occurs. From this perspective, Dyson approaches the perception of sound as mobile and subjective.

> (…) thus the phenomenal characteristics of sound and listening – describing a flow or process rather than a thing, a mode of being in a constant state of flux, and polymorphous subjectivity (…)(Dyson 2009: 5).

This nature denies the possibility of objectifying sound or perceiving it as a stable entity. From a similar perspective, Salomé Voegelin uses the term "stability" to refer to the objectivity of sight, and to emphasize the contrast with the unstable experience of sound:

> Sound by contrast negates stability through the force of sensory experience. Listening's focus on the dynamic nature of things render the perceptual object unstable, fluid and ephemeral: unsettling what is through a world of sonic phenomena and audible spirits. Sounds are like ghosts (Voegelin 2010: 12).
> Listening cannot contemplate the object/phenomenon heard separate from its audition because the object does not precede listening. Rather, the auditory is generated in the listening practice: in listening I am in sound, there can be no gap between the heard and hearing, I either hear it or I don't, and what I perceive is what I hear. I can perceive a distance but that is a heard distance. The distance is what I hear here, not over-there. It does not signal a separation of objects or events but its separation as perceived phenomenon (Voegelin 2010: 4).

Both, "mode of being" (Dyson) and "I am in sound" (Voegelin) refer to the experience of sound as "being in". This reflects the ontological significance of sound as a sensorial experience. The way Voegelin understands the inseparable relation "object/phenomenon" has some resemblance with the notion of sound as "event", as in the temporal approach of Dyson. Both authors deduce similar ontological implications from studying the physical nature of hearing.

Voegelin's description of a blurred separation between object and "perceived phenomenon" approaches the notion of "resonance" that Jean-Luc Nancy proposes. "Why, in the case of the ear, is there withdrawal and turning inward, a making *resonant*, but, in the case of the eye, there is a manifestation and display, a making *evident?*"(Nancy 2007: 3). When we see, we recognize the objective quality of what is presented, when we listen, we resonate.

> In terms of the gaze, the subject is referred back to itself as object. In terms of listening, it is, in a way, to itself that the subject refers or refers back.(…)The visual is tendentially mimetic, and the sonorous tendentially methexic (that is having to do with participation, sharing and contagion)(Nancy 2007: 10).

Participation, sharing and contagion are essential terms to understand the notion of resonance through sound. Resonance can be thought of as the *contemporaneously* (working together to create an experience of plural perspectives) interconnected experience of the three terms mentioned above. Through listening, participation, sharing and contagion cannot be separated. Contagion and sharing refer to the notion that subjects vibrate simultaneously (resonate) with the sources perceived. Participation refers to our active role in perceiving the plurality of sound. The relation of these terms refers to the interconnected plurality that results from hearing. "There is the *simultaneity* of the visible and the *contemporaneity* of the audible" (Nancy 2007: 16). Through this, Nancy differentiates the "individual" plurality that people perceive in the vision of available objects with the "singular plural" sharing of hearing.[13] *Simultaneity* implies a possible number of individual actions or objects. *Contemporaneity* refers to the mobile quality of sound and to the necessity of an "event" for it to appear. To further clarify this, Nancy again puts listening in contrast with the visual: "visual presence is already there, available, before I see it, whereas sonorous presence *arrives* – it entails an *attack*" (Nancy 2007: 14). An object in a room is there with us, and we can look at it whenever we want, it stays in the physical space and we recognize its individuality. On the other hand, we cannot separate the happening of sound from its sensation. In this way, sounds happen "at the same time" inside and outside of oneself.

> To listen is to enter that spatiality by which, at the same time, I am penetrated, for it opens me as well as around me, and from me as well as towards me.(…)To be listening is to be *at the same* time outside and inside, to be open *from* without and *from* within, hence from one to the other and from one in the other (Nancy 2007: 14).

The notion of listening, as presented in the previous quote clearly describes the characteristics that I want to focus on within an open and immersive experience. Here, Nancy also suggests the sense of "being singular plural" that occurs through listening. The sense of being-with that Nancy proposes can be related to the plural experience (participation, sharing and contagion) that occurs through listening. Listening does not reveal an individual "I" but it implies an elucidation of our coexistence through a sensorial experience. Therefore, listening can be thought of as an exposition to plurality. The following quote from Nancy's book *Being Singular Plural* resembles the argument on listening (from Nancy's book *Listening*) described in the quote above. "The outside is inside; it is the spacing of the dis-position of the world; it is our disposition and co-appearance" (Nancy 2000: 13). From this perspective, "being-in" complements the sense of "being-with". Voegelin also combines these two notions: "The sonic reality is intersubjective in that it does not exist without my being in it and I in turn only exist in my complicity with it" (Voegelin 2010: 10). When Voegelin uses the word "turn" she refers to a transformation towards a new sense of self. This transformation can only occur within a dynamic physical experience. An immersive experience operates in the same manner. From this perspective, the ontological implications of hearing can be considered as immersive. In the previous quote, "complicity" refers to an involvement and a sharing, to a "being-with" in the sonic experience. The basic difference between sight and hearing is that in the latter this complicity is not a choice. We can occupy a space with an object in a room, but we do not need to look at the object or acknowledge its presence. Once we are aware of it, we are able to build a mental space and as a consequence we have the possibility to re-encounter it. But for this to occur, focal attention and a conscious formulation of this re-encountering are necessary. This 'conscious visual confrontation' does not need to happen. It is a choice. This possibility to choose enhances the sense of separation and individuality between us and objects. On the other hand, "being-with" in sound happens during a dynamic event where source, physical space, and receiver resonate, blurring the feeling of individuality and separation.

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[13] Singular plural, as devised by Jean-Luc Nancy, describes an ontological condition where "being is always 'being with,' that 'I' is not prior to 'we', that existence is essentially co-existence" (Nancy 2000: back cover).

1.2.3 Sharing sound and light

> The fact that man generally relates to the audible in the same manner that predominates in his visual relationship with distant objects – objectifying and distracted rather than intimate and affected, in a state of self-preservation and distancing – reminds us that the relation between ear and intimacy cannot be exclusive. Therefore, listening alone is by definition not enough to gain access to a wakeful intimacy, just as it is not possible to turn men into mystics simply by telling them that they are being-in-the-world (Sloterdijk 2008: 287-288, my translation).

To study and acknowledge how sight forged our way of thinking may create a misleading critical approach towards the perceptual qualities of sight. Sight aided in the development of how individuals think about the world, write about the world. As previously mentioned, this notion could be perceived as a false objectivity. Therefore, sight could be thought of as interfering in the creation of a pure sensorial experience detached from meaning. In the creation of an immersive artistic context, sight has to be approached from its sensorial characteristics and mechanisms. Viewers have the capability to be detached from their "seeing as believing" objective sense of the world. The artist can achieve this by avoiding or deconstructing the normal ways of seeing. What viewers see can be affected by what they hear, and vice-versa. Consequently, to think of a phenomenology of immersion, it is important to consider the contemporaneity and interaction between all of the senses.

Salomé Voegelin perceives that a new philosophy of sound would open our visual notions. "...a sonic sensibility would illuminate the unseen aspects of visuality, augmenting rather than opposing a visual philosophy" (Voegelin 2010: xiii). The philosophy of sound as proposed by Voegelin starts as a reflection of her physical experiences and her lived participation in art. As a consequence, her way of thinking about philosophy resembles the experience of life through the senses (phenomenological). A philosophy, one that departs from the aural, can lead to a cross-modal investigation of sight. More importantly, when exploring immersion, it is not possible to exclude or isolate any of the senses. The way in which a phenomenological philosophical discourse is devised is influenced when having as a reference the relations, differences and similarities between the different senses. From this perspective, Voegelin describes how Merleau-Ponty's phenomenological approach (one that includes all of the senses) elucidates aural notions from a visually charged language:

> Merleau-Ponty talks about his world of perception in visual terms. The sensibility of his perception however is not that of vision. It is not vision that painting and philosophy has liberated from representation; it is sonic perception, which is free of the visual stranglehold on knowledge and experience. Sound does not describe but produces the object/phenomenon under consideration. It shares nothing of the totalizing ability of the visual. It does not deny the visual reality but practices its own fleeting actuality, augmenting the seen through the heard (Voegelin 2010: 10).

Merleau-Ponty tended naturally towards a philosophy that integrates the senses to describe perception. Voegelin's viewpoint is that reflecting on listening develops this integration. By presenting Merleau-Ponty as a reference, she also proposes that a description of a multisensory experience will tend to aural ontological notions, despite the visual language used. However, it should be noted that her research still focuses on the phenomenological and ontological implications of sound perception, and not on the aural implications of a multisensory experience. Voegelin, on repeated occasions, insists on the enhancing effect of hearing on what we see:

> If I notice a concurrent sound, I most likely subsume that heard into the appreciation of the seen: sound fleshes out the visual and renders it real; it gives the image its spatial dimension and temporal dynamic (Voegelin 2010: xi).
>
> Sound involves me closely in what I see; it pulls the seen towards me as it grasps me by my ears. Sound renders the object dynamic. It makes it 'tremble with life' and gives it a sense of process rather that a mute stability (Voegelin 2010: 11).
>
> Listening as an aesthetic practice challenges how we see and how we participate in the production of the visual world. Listening allows fantasy to reassemble the visual fixtures and fittings, and repositions us as designers of our own environment. It challenges, augments and expands what we see, without presenting a negative illusion, by producing the reality of lived experience. Through this generative experience listening revisits those philosophical tenets that are bound to the sovereignty of the visual (Voegelin 2010: 12-13).

In the quotes above, Voegelin places emphasis on the transformation and redefinition of the visual experience through sound. The phenomenological and ontological implications of sound mediation as described in these quotes correspond to my approach of an immersive experience as an elucidation and embodiment of reality. Listening can be described as an immersive experience. When listening mediates vision, it transforms our alienated sense of being towards an embodied and shared experience.

When aware of these characteristics, we establish a hierarchy of the senses, where hearing is above the visual, as resulting from the superiority of hearing over vision in regards to immersive experience. After exposing the predominance of sight in the history of Western thinking, and the newer developments in philosophy with the emphasis on the experiential role of hearing, it is necessary to ask, how does sight affect what we hear? The deeply introjected visual behaviors (psychological, cultural, and practical) affect the way we listen to the world. Clear examples of visual mediation are the *McGurk effect* and the *ventriloquist effect*.[14]

> The McGurk effect is a perceptual phenomenon in which vision alters speech perception (for example, a sound of /ba/ tends to be perceived as /da/ when it is coupled with a visual lip movement associated with /ga/). The perceived spatial location of a sound source is also known to be drastically influenced by visual stimulation. This effect is known as the *ventriloquist effect* (Howard & Templeton,1966) and is a common experience in daily life, such as when one is watching movies on television or at the cinema and voices are perceived to originate from the actors on the screen despite a potentially large spatial discrepancy between the image and the sound source (Shams, Kamitani, and Shimojo 2004: 27).

In these effects, vision overrides sound, creating a sound illusion. In the *ventriloquist effect*, vision corrects the non-correspondence between the object seen and the sound source. This effect is more likely to occur when the visual sources are clear. Sound also influences this perceptual effect. The following abstract fragment describes the bi-modal (visual and aural) characteristics of this effect.

> Originally, ventriloquism was explained by performers projecting sound to their puppets by special techniques, but more recently it is assumed that ventriloquism results from vision "capturing" sound. In this study we investigate spatial localization of audio-visual stimuli. When visual localization is good, vision does indeed dominate and capture sound. However, for severely blurred visual stimuli (that are poorly localized), the reverse holds: sound captures vision. For less blurred stimuli, neither sense dominates and perception follows the mean position. Precision of bimodal localization is usually better than either the visual or the auditory unimodal presentation. All the results are well explained not by one sense capturing the other, but by a simple model of optimal combination of visual and auditory information (Alais and Burr 2004: 257).

As mentioned above, the bi-modal characteristic of the ventriloquist effect can be better explained with a combined bi-modal approach. This bi-modal approach differs from research in which one sense is chosen as the focal point. In most of my reference literature, hearing and sound are the reference points from which sensory experiences are described. Sight is usually just presented in a complementary way, and used to exemplify and emphasize the mediating qualities of sound (as in Voegelin or Dyson). The research of Alais and Burr reveals the variability of the cross-modal interactions that occur in the *ventriloquist effect*. As a consequence, the mode of investigating this effect cannot have a predetermined hierarchy between sight and hearing. Immersion, as a multisensory and psychological experience, has to be studied in the same manner, allowing the emergent properties and their possible hierarchies to reveal themselves through time. A unimodal or dualistic approach towards the study of immersion always excludes something from the experience, and imposes a sense of hierarchy between the senses.

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[14] The following link from the BBC channel in YouTube, shows a short explanation and video example of the McGurk effect http://www.youtube.com/watch?v=G-lN8vWm3m0

Moreover, the *ventriloquist effect* is not just a sound illusion, but a spatial one. Consequently, visual phenomena, as the ones of the *ventriloquist* and *McGurk effect*, must be taken into consideration when creating spatial compositions or installations. It is necessary to think of sonic spatialization simultaneously with its visual connotations.

On the other hand, the *McGurk effect* shows a clear domination of sight in the perception of the incoming incongruent stimuli. This effect occurs due to the multisensory mechanisms of speech perception. The visual gestures produced by the mouth are associated with specific sound results. This association implies an important role of memory and the existence of a learning process through repetition. This correspondence is achieved through learning. This also reveals that perception is affected by expectation. A specific sound is expected to be heard with a specific visual mouth gesture. In the *McGurk effect*, the incongruity of the expected association is corrected according to the visual input. In spite of the fact that the ear physically receives another sound, the heuristic functions within the brain cause us to perceive (imagine) the expected corresponding sound. Moreover, this effect is increased when the words or syllables to be pronounced are previously announced. The semantic information that is expected by the perceiver increases the *McGurk effect* (Windmann 2004: 212).

The problem of expectation that is described in the *McGurk effect* proposes a strong association between sound and visual memory. What happens when one sees a fishbowl falling and shattering behind a sound proof glass? Would we feel a sound related stress? Would our brain prepare for a sound event? What if a speaker on our side produces a double bass pizzicato when the fish bowl is exploding? Would the bass sound be perceived differently? Although the *McGurk* effect has been studied solely in the context of speech recognition and semantics, it suggests that the entrainment of these associations between vision and hearing could also affect non-speech events through corresponding expectations. Watching the falling fishbowl through the sound-proof glass creates an expectation of sound. When we see it shatter, in what would be its loudest moment, we feel the sound[15], even if we cannot physically hear it or recognize a specific illusion as in the *McGurk effect*.

When we see a violin player ready to play the violin, we are conditioned with an expectation of limited characteristics. We expect a characteristic violin timbre, and our memory of heard violin repertoire frames our expectation for the possible outcomes. The visual object predisposes our receptive attitude. Although the music performed might not be known, the violin offers known sonic aspects and aesthetic expectations. These built-in associations between the instrument seen and its sounding possibilities interfere with achieving a state of openness. From this perspective it can be thought that our culturally introjected forms of expectation seem to contradict with a sense of openness. By recognizing this problem, I propose that incongruities between visual and sonic events can create a state of openness.[16]

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[15] For further empirical investigation, you can run the images at the following link: http://i.imgur.com/v89fo.gif

[16] This notion will be discussed later in relation to my musical works.

1.2.4 Light without meaning

(As I look through the window of the train, transformations of the landscape reach my eyes while I think of what I did earlier in the day. I am immersed in a space of movement while I focus on something in my mind that seems completely unrelated to the seen. I do not think about the objects and forms that I see. I do not recognize them. The visual is happening as a texture of light.)

How different is the previous experience to an immersion in sound? Associating this question with "where is what we see?" can also lead to the notion of resonance as in sound but through light. We are constantly immersed in the physical characteristics of light. However, waves and particles of light are perceived as more ephemeral and more immaterial than sound waves. While sound hits us, light appears to have a physicality that is illusory.

After reading the previous sub-chapters, one can easily imagine and feel that sounds happen in the ears. In sound, humans can feel that they are physically resonant. Readers can also further understand this by studying the physics of sound and psychoacoustics. People can physically perceive and theoretically analyze this phenomenon. Sound occurs within the listeners' physical reality. However, disregarding all the previous arguments and the general ideas about an ocular-centered history, the answer to the question "Where is what we see?" is not that simple. As mentioned earlier, visual cognitive processing may make readers think of sight as causing symbolic representations rather than only as a mechanic or purely physical sensation.

"Reflected light is the physical ground of sight, one of its enabling conditions. But I don't *see* light. I see what is illuminated" (Noë 2012: 37). In this quote the Professor of philosophy Alva Noë describes the psychological perception of what is seen considering that viewers perceive "the mediating role of light (…) ,as it were, *transparent*, (…)" (Noë 2012: 37). With this he describes the dis-embodied relation that viewers have with the media of sight. However, studying the physical nature of light can allow us to perceive and think of sight in a more experiential manner. Light can be observed as waves of electromagnetic radiation or as particles (photons). Light does not need a medium in which to travel. However, similar to the nature of sound, light has the ability to reflect, refract, and be absorbed. We have evidence that light can travel in our physical environment as well as in an "empty" space (vacuum) where humans cannot be or listen (Gibbs 1996: n.p.). We are able to acknowledge these physical characteristics but we cannot experience them in an empty space. As a consequence of acknowledging this impossibility, we may perceive light as immaterial. This notion has been the source of diverse religious and spiritual associations to light. If we consider this notion and connect it to the idea that what humans see is light and not just the reflected objects, then sight loses its objective psychological influence. What we see are variations of an illusory (im)materiality that we cannot grasp. For this reason, our built visual objectivity is a form of limiting and classifying the unclassifiable. While sound is empirically sensed in our bodies, the visual is experienced as a distant virtuality. From this perspective, what we see can be thought of and perceived as physically inexistent. This virtuality demands proof. When we touch, taste or listen what we see, we add the sensation of a physical proximity. If we close our eyes, previously seen objects might actually be perceived as not being there anymore. From this perspective, the certainty that arises from the visual only exists as thought. Objective certainty through vision relates to the recognition and identification of objects. We generally recognize the visual as objective and static. This behavior refers to *perceptual constancy* (psychology):

> Traditionally, psychologists characterize perceptual constancy this way: we experience objects as unchanged or as constant and stable in their perceptual properties despite the changing character of perceptual sensation or perceptual stimulation … As you change the angle at which you view the silver dollar, the shape of the image of the coin on your retina changes, yet you do not experience the coin as changing in shape (Noë 2012: 55).

This psychological notion describes an objective relation with what we see. In sight, we do not perceive an objective certainty drawn from the physical experience but from an introjected cognitive mechanism. To think of sight is only to imagine that one is experiencing a sense of being. However, and despite our lack of perceiving this, we are physically immersed in light. On the other hand, to be immersed in sound is to be in the physical world. Sound is a clear embodied proof, a certainty of belonging. To hear is to physically experience being.

To answer the question "how is light immersive?" and to consider light as a basic immersive aspect in art, it is necessary to observe it as an always-transforming matter. To be aware that light is in constant transformation reduces the perception of objects as closed entities separated from one's experience. This approach may transform both the way we perceive what we see and the way we think through vision. Being aware of the predominance of sight in Western thought opens a space to re-think sight from its temporal and immersive qualities.

1.3 Mirrors and Immersion

1.3.1 Mirrored

How is listening similar to the experience of regarding oneself in a mirror? From an auditory perspective, when we speak we resonate, our whole body vibrates, allowing us to listen to ourselves from inside and from outside. Do we think of this vibratory experience as the recognition of ourselves in resonance within our environment? When we listen to our own voices in a recording we perceive it as coming from a total stranger. Probably, this is the same perception one would have had when he/she first realized that the individual reflected in the mirror was him/herself. A visual reflection proposes an image that we can easily associate to our referential and symbolic thinking. We are able to separate and identify the image of ourselves as a representation. Moreover, we have a visual vocabulary and tools to describe the image of ourselves. On the other hand, when we listen, we cannot separate the recognized source from the physical experience. Thus, it is difficult to describe in a symbolic manner how we are "being" as separate from the way we resonate in sound. When we listen, we are always relating to a resonating space and to the sound sources, we are physically experiencing the vibration produced by the source.

> (…), the visual is tendentially mimetic, and the sonorous tendentially methexic (that is, having to do with participation, sharing, or contagion), which does not mean that these tendencies intersect (Nancy 2007: 10).

I reuse this quote (already presented earlier in this chapter) to emphasize the mimetic nature of the visual (having as reference the different methexic nature of sound). When approached from the angle of imitation and representation, mimesis implies a duality. For imitation to occur there must be a "copy" and "original" object. This also implies a simultaneity: the object becomes an original upon the appearance of a copy. In this sense, when we see the image of ourselves in a mirror, we are seeing a representation that creates the original. As a consequence, the elucidation of the "original" enhances the sense of self. The mirror places us in reference to the world. Therefore, looking at ourselves in a mirror can be understood as the experience of the visual resonance between the reflected image with the observer, and correspondingly, between the virtual and the real space. Through the use of mirrors, mimesis can be thought of as occurring from a methexic phenomenon. The self-reflection allows us to recognize our personal characteristics and how these characteristics relate, resemble, and differentiate with the surrounding elements. Nancy argues that perceiving a sense of self can only occur in resonance.

> A subject feels: that is his characteristic and his definition. This means that he hears (himself), sees (himself), touches (himself), tastes (himself), and so on, and that he thinks himself or represents himself, approaches himself and strays from himself, and thus always feels himself feeling a "self" that escapes [*s'échappe*] or hides [*se retranche*] as long as it resounds elsewhere as it does in itself, in a world and in the other (Nancy 2007: 9).

When we listen, we perceive a vibratory *contemporaneity*, in relation to physical space and time. Even if there is a time delay between the attack of the source and the moment when we perceive it, we can only experience the sound in the moment it reaches our bodies. We always listen in resonance. This implies a physically embodied "singular plural" sense of self where what we listen is simultaneously perceived both inside and outside our bodies. Although visual self-reflection seems to lack the embodying effects of sound, it still produces physical sensations with ontological implications that are analog to immersive notions. The following arguments intend to elucidate this proposal.

How does the ability to immerse oneself in a screen resemble the experience of looking at oneself in a mirror?

Is there sound in the virtual space reflected in a mirror? The reflected world that we are able to see in a mirror lacks sound. When we look in a mirror we might see someone walking deep inside it, but the sounds of the steps come from behind us in our real space. We are not able to perceive an embodied sensation from the reflected image. The embodiment is felt in relation to events that occur in the real space. In the mirror, we can only visualize the physical actions that we are embodying in reality. Other senses seem not to penetrate the virtual world of the mirror. In spite of this perceptual absence, the notion of seeing oneself in a mirror is what we would most commonly think of as self-recognition.

However, it is not possible to just think of mirrors isolated from the experiential context. The psychological alienation that occurs through sight contrasts with the physical sensations that are triggered by vision.

When we experience self-recognition through mirrors, we develop a solipsistic sense of self. Merleau-Ponty describes self-acknowledgement through mirrors as a wary experience, producing an alienated sense of self:

> At the same time that the image makes possible the knowledge of oneself, it makes possible a sort of alienation. I am no longer what I felt myself, immediately, to be; I am that image of myself that is offered by the mirror. To use Dr. Lacan's terms, I am "captured, caught up" by my spatial image. Thereupon I leave the reality of my lived me in order to refer myself constantly to the ideal, fictitious, or imaginary me, of which the specular image is the first outline. In this sense I am torn from myself, and the image in the mirror prepares me for another still more serious alienation, which will be the alienation by others. For others have only an exterior image of me, which is analogous to the one seen in the mirror. Consequently others will tear me away from my immediate inwardness much more surely than will the mirror (Merleau-Ponty 1964: 136).

We do not perceive or relate critically to the negative connotations of this phenomenon. There is a dichotomy between the psychological effect and the way mirrors operate. Despite the pessimistic tone of the quote above, the inseparable interaction between the observers and the perceived exteriority resembles the idea of resonance. The professor of psychology Philippe Rochat and the philosopher Dan Zahavi comment on Merleau-Ponty's idea of self-reflection. "It shows up every time I look in the mirror, it is glued to me in the sense that it moves with me. I cannot freely establish a distance and perspective on it, as I can with other objects. Indeed, I cannot get rid of my exteriority, my exposed surface" (Rochat and Zahavi 2011 6). The inseparability between the outside and inside contradicts with Merleau-Ponty's idea of alienation. When Rochat and Zahavi state, "I cannot freely establish a distance and perspective on it (self-reflection), as I can with other objects", the contradiction relies on the fact that the ability to establish distance with objects is an ability to alienate. The reflected self may produce an alienating psychological effect as described above. However, the way with which the mirror operates is non-alienating. Moreover, once we recognize and accept the way a mirror operates, we do not question the optical illusion that can suggest the existence or representation of an "other" inside it.

The "mirror box" experiment demonstrates a visual illusion, in which a reflection is perceived as part of our body. The neuroscientist Vilayanur S. Ramachandran devised the mirror box (with mirrors reproducing the subjects' missing hand) to help the alleviation of phantom limb pain. Patients who have amputations suffer from phantom limb pain as a result of feeling they still have their missing limb.

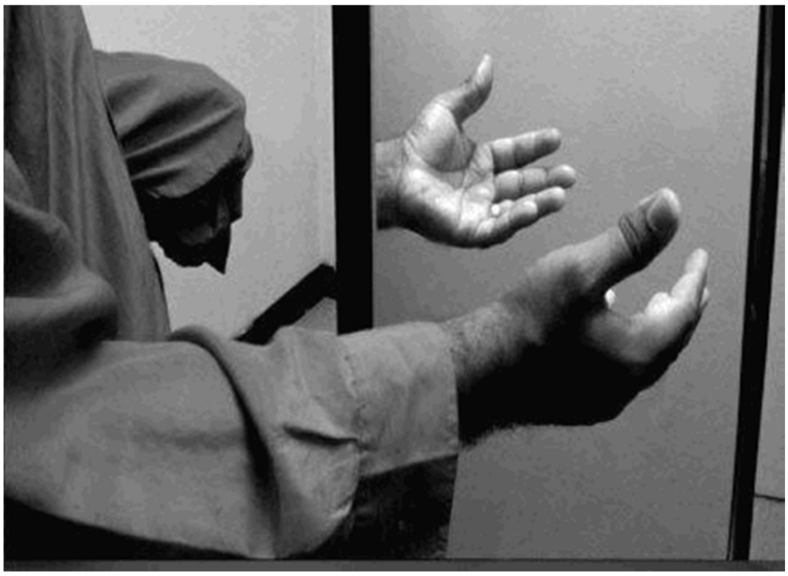

Figure 2 Mirror Box (Ramachandran 2011: 33).

> The mirror arrangement for animating the phantom limb. The patient "puts" his paralyzed and painful phantom left arm behind the mirror and his intact right hand in front of the mirror. If he then views the mirror reflection of the right hand by looking into the right side of the mirror, he gets the illusion that the phantom has been resurrected. Moving the real hand causes the phantom to appear to move, and it then feels like it is moving—sometimes for the first time in years. In many patients this exercise relieves the phantom cramp and associated pain. In clinical trials, mirror visual feedback has also been shown to be more effective than conventional treatments for chronic regional pain syndrome and paralysis resulting from stroke (Ramachandran 2011: 33).

This effect does not only reveal a strong sense of self-recognition through the reflected image, but also a physiological effect from what the eyes believe they see. As in the McGurk effect, the "mirror box" affects the other senses through sight. In the "mirror box", the reflection is perceived as a physical part of us. These kinds of illusions suggest that a mirrored self-reflection is not just perceived in its virtuality, because the visual stimuli are translated into physical sensations which are associated to the other senses. From this point of view, we can assume that we develop embodying traits through sight. As a consequence, self-recognition in a mirror cannot only be thought of as a disembodied psychological experience, but also as a translation of visual elements into an embodied experience. The self-reflection in a mirror can be thought of as the resonance of the visual as feeling.

We perceive the mirror image as an "I", as a truthful and immediate translation of the superficial image of oneself. Umberto Eco calls this behavior the "pragmatics of the mirror" (Eco 1984: 207).

> Men can use mirrors just because they know that there is no man in the mirror and that the man to whom right and left are to refer is the observer and not the (virtual) individual who seems to be looking at the observer (Eco 1984: 207).

We are aware that we are the referent. "The mirror image is present in the presence of *a referent which cannot be absent*" (Eco 1984: 216). This makes us speak about the image in front of us, as if it was ourselves. When we look in a mirror we naturally formulate thoughts such as "I look tired", or we might say to someone "come to the mirror to look at your face". We go to visit our image. Do we resonate with the mirror? Our mirror image doesn't stay imprinted in the glass surface, and as we know that, we perceive that we are responsible for the image in the mirror. As there is no previously available image in the mirror, we cannot think of the image as a preexisting simultaneity. In this way, the image in the mirror can be thought of as an analogy to the notion of the *contemporaneity* of the audible as Nancy argues. The reflection in the mirror is an event, an apparition that can only occur in reference to our action of placing ourselves in front of it. Additionally, in the "pragmatic" sense, we do not think of this consciously every time we look at our reflection in a mirror. We just use mirrors functionally as "we have introjected the rules of catoptric interaction"(Eco 1984: 207).[17]

Our left side in reality corresponds to the right side of the reflected other in the mirror image, while in photographic and video images that inconsistency is normalized. When we look at a photographic picture or a video recording of ourselves, we see a reversed mirror image. This means that in this media, the image represented has the left to right orientation that it would have if we were looking at another person in reality. However, it is impossible to look at a copy of oneself in another position in reality. We perceive a physical and time distance from recorded images, as they differ from the real time during which they occurred and they are imprinted in a different material.

> The main point is that imprints are motivated by *heteromaterial*: the plate [used in photography development] turns light rays into different matter. We no longer perceive light rays but pure intensity relations as well as pigmentation relations. Thus there has been a projection from matter to matter (Eco 1984: 223).

The virtual quality projected from an imprint differs from the way we perceive a mirrored self-reflection. In a pre-recorded video projection, the image appears from an imprinted object, while in a mirror reflection, the image is seen due to the presence of the referent. We have an introjected perceptual differentiation between a screen and a mirror image. However, with the use of communication software such as Skype©, the immediate projection of a digital imprint blends with a mirror sensation. During a Skype video chat, the projection of the interlocutor is presented as if he was in front (normal video inversion), while the projection of oneself is fixed so that the left right orientation resembles a mirror effect. We don't perceive the interlocutor as being beside the mirror image. Both projections are intentionally differentiated.

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[17] Catoptric: relating to a mirror, a reflector or reflection (Oxford Dictionaries)

In the mirrored window of Skype, we can realize how the other sees us. In this sense, we also use the screen as a way of imagining ourselves. Nevertheless, we see this image within a proposed virtual space that offers multiple kinds of stimuli simultaneously. Confronting multi-tasking visual spaces trains us to unconsciously differentiate the roles of each projected image. Through Skype, we are able to experience the function of a mirror without the need of a mirror object. At the same time, the mirror window portion of the multi-faceted screen experience allows us to recognize ourselves as part of a virtual multifaceted entity.

We adapt to the surrounding contexts of a mirror image. In any case, when we know that we are in front of a mirror we seem to have faith that what we see is the truthful reflection of reality. This phenomenological relation has been naturally absorbed by the phenomenon of the screen. We allow ourselves to be mirrored without mirrors. The pragmatic way in which we experience mirrors and screen projections blurs our objective awareness of the source.

Frances Dyson proposes that immersion in new media and VR art is obtained by diminishing the critical attention towards the apparatuses that produce the sensorial stimuli. Immersion is an enveloped sensorial experience where the viewers lose or reduce their critical awareness of the transmitting objects and where the embodied experience is what absorbs their attention. This occurs due to the lack of physical objectivity in the way new media operate. She describes how new media blur the referential quality of the stimulus and associates this to the way we perceive sound.

> The features that differentiate new media – the ability to "enter the screen", to interact with three-dimensional images or "virtual objects", to acquire a new subjectivity, a liquid identity, to enjoy authentic rather than mediated experience, and to transcend the material – all these features are present in the phenomenality of sound, in the metaphysics of the ephemeral, and in the rhetorics of Western art music (Dyson 2009: 3).

With mirrors, we also transcend the material. A mirror becomes a mirror when we interact with it. The active interaction is prior to understanding its objectivity. Therefore, mirror images, approached from the perspective of light absorption as opposed to visual cognition, can be thought of as analog to sound phenomena.

Mirrors operate in an immersive way. However, this form of immersion is an acquired way of visually interacting, and not an endogenous immersive physical mode. We learn how to relate to mirrors. The psychologist Beulah Amsterdam investigated the process of self-recognition in mirrors with children under two years of age. Amsterdam's article "Mirror self-image reactions before age two" reveal the learning process that leads towards self-recognition in a mirror. The abstract of her article briefly describes the stages of this process:

> The behavior of 88 children between 3 and 24 months was observed before a mirror, using an objective technique to examine the child's awareness of the image as his own. The results indicate the following age-related sequence of behavior before the

> mirror: the first prolonged and repeated reaction of an infant to his mirror image is that of a sociable "playmate" from about 6 through 12 months of age. In the second year of life wariness and withdrawal appeared; self-admiring and embarrassed behavior accompanied those avoidance behaviors starting at 14 months, and was shown by 75% of the subjects after 20 months of age. During the last part of the second year of life, from 20 to 24 months of age, 65% of the subjects demonstrated recognition of their mirror images (Amsterdam 1972: 297).

The stages described above demonstrate the immateriality of the mirror as they describe behaviors that result from the interactive qualities of the reflected image. From the first confrontation with the mirror, the reflection is a live interaction. Through this interactivity, children learn (in a conflictive psychological process as described above) that what they see is a reflected image of themselves and of the world. The interactive quality of this process makes the children not perceive the mirror as an object. Although at a certain age we acknowledge the mirror as an object, the fact that we first experienced its dynamic nature before recognizing the object establishes a form of interactive relation, which will always surpass the objectivity with which we confront it. With most objects we would ask –what is this (object) for? Then we would learn how it operates. It was initially an object, and later on we understood its function. On the other hand, a mirror is first an experience, and then much later an object.

After incorporating catoptric interaction, we allow ourselves to be immersed in mirrors. We can be doing something practical, such as shaving or putting on make-up in front of the mirror, while immersed in thoughts, listening to music, or feeling hungry. All of these can overlap in a multilayered experience. An immersive experience combines the interactions of the immersant's mental states and thoughts with the surrounding stimuli of the given space. In *Everyday Music Listening,* Ruth Herbert explores how we experience music in diverse everyday contexts. She proposes that listening to music cannot be categorized in specific listening modes, but that any music listening combines a multiplicity of modes where "attention is inevitably multi-distributed" (Herbert 2011: 2). Herbert criticizes the persistence of the simplistic notion of approaching listening from two modes: the "special", which refers to the 'proper' directed listening where music is the main focus, and the "everyday", which refers to unattended listening (Herbert 2011: 2). She also "suggests that the boundaries between unusual [referring to the "special"] and mundane [referring to the "everyday"] experience are very often blurred" (Herbert 2011: 2). Herbert's main focus is on how the listener experiences transformations in consciousness when music is present. She considers the fact that music may happen surrounded by a multiplicity of stimuli, and that music transforms the way we perceive them. "The combination of different stimuli, mediated by music, may provide multisensory entry points for perceptual involvement, affording mildly transformed alterations of consciousness" (Herbert 2011: 3). Accordingly, she does not hierarchically privilege one mode of listening over another. Herbert's point is that all experiences of music listening imply ongoing transformations in the listener's conscious state. With this, Herbert is not separating the conscious states from their environmental influences. We can shift into a diversity of modes, with all of them related and conditioned by the surrounding stimuli. From this point of view, what the presence of the mirror does is to create an enhanced sense of self-awareness while experiencing the environment. The multifaceted characteristics of the environment (in relation to Herbert's arguments) enhance the sense of self-awareness when one is in front of a mirror. Self-reflection in a mirror allows us to experience the multiplicity of surrounding stimuli and conscious modes (in all their diversity) while feeling self-represented. That one there, that is me, that is the one experiencing all this.

1.3.2 The mirror setup

The setup of *What about Woof?* resulted as a practical solution to visually connect all of the players. They must look at the screen continuously and focus on the speed, size and form of their and their co-performer's hand, arm and head movements.

The screen is placed higher so it produces a deformed mirror effect. The players are looking up at the screen and thus the projected images of the players are also looking up. This phenomenon does not correspond with the one of a common mirror. When we look at our eyes in a mirror image, the reflected version can only be looking back at our eyes. In order that the projected image looks toward us, we should look directly into the camera, but then it is physically impossible to look at the screen at the same time. Nevertheless, when we look to another part of our body on the screen, the visual effect is almost the same as in a mirror. The distance between the eyes and other objects within the projected image are the same distance as would occur in a mirror reflection. As a consequence, the projection blurs the differences between the virtual characteristics of the projection and a real mirror experience. At the same time, the practical functionality of the screen produces a pragmatic relation with the screen, as if it were a mirror.

The mirror effect is also experienced by the audience. The performers are sharing the real space and have the same physical orientation as the audience. Everyone looks at the screen. The hall and part of the audience are also projected on the screen. This reflection creates a differentiation between how the audience perceives a projection of an event in another space and time (as in a film) with a real time projection of the place where the audience participates. The pragmatic nature of how we relate to mirrors creates an immersive territory where what we see as a performance includes us within it. In a film, the audience observes a proposed separate reality, which has its own times and rhythms, while in the projection of *What about Woof?* the audience looks at a performance which involves themselves in real time.

The performers are placed on a higher level on the stage. This does not differ from concert hall conventions. The audience recognizes the common boundaries. However, as the piece starts and the attention is gradually moving more and more towards the screen, the physical position of the performers starts working as a transitional area between reality and the virtual image of the screen. This transitional space might blur the separation between the performers and the audience. Also, this is the area where the sound is produced. As seen above in Figure 1 (page 19), there are speakers placed behind the performers pointing towards the audience. The horizontal positioning of the speakers corresponds to the positions of the performers where the sounds are produced. This creates a sound reflection related to space, and a corresponding physical relation with the mirror image. In this way, the projection is experienced as if sound was coming out of it and the sounds are coming from where the visual actions are seen. This is perceived as a ventriloquist effect in a mirror.[18]

As mentioned earlier, a mirror does not project sounds towards us. In the case of *What about Woof?* the perception of sound as if coming out from the reflection denies the possible duality that the mirror image can suggest. The combination of seeing a reflection of the space, where one is present, with the sound that is perceived, enhances the sensation of a shared experience. The illusion of a sonic reflection makes the listeners perceive themselves resonating with the reflected space. I imagine that the sound might be perceived as coming from the reflection. In consequence, the reflected listeners also perceive themselves as producing sound, even though they do not produce the sound in reality (analog to the mirror box). With the presence of sound, one's pragmatic relation to the mirror is transformed and augmented by an embodied sensation.[19] In this context, the sense of "feeling myself" is added to the perception of "seeing myself". "Looking at" and "being in" are experienced simultaneously.

The sonic and the visual complement each other to create an immersive context where the listeners can perceive themselves simultaneously as a part of reality and as a part of a virtual space. The visual projection, which would normally be understood as the virtual element, is in this case, contradictorily, that which produces a sense of reality, due to our introjected behavior with mirrors. In this context, I consider the mirror reflection as normal. The resulting ventriloquist effect produces a physical sensation which does not belong to the normal mirror effect. This "unnatural" sensation creates a space that differs from what we perceive as normal, and produces the sensation of a virtual presence that we belong in. Nevertheless, facing a mirrored sounding projection, the commonness with how we relate to mirrors makes us feel that what transforms is reality, and not a parallel virtual world. Immersion does not seem to occur in another virtual space, but in the intertwining of reality and musical experience. In this case, immersion is perceived as a form of enhanced and transformed awareness within reality.

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[18] I imagine a mirror — with hidden speakers that can simultaneously project the sounds that occur in the physical reality towards the viewer. For instance, if I speak facing the mirror the reflection speaks simultaneously back. In a case like this, sound would increase the sense of separation between the referent and his reflection. Suddenly the one reflected is physically independent. However, *in What about Woof?* the audience is not speaking, they just perceive sound from the reflection of the musicians. In this way the listener does not belong in the world of the screen or in the world outside, but to an embodied interaction of multiple spaces. The listeners see themselves beside reflected bodies that are sounding from inside the virtual space.

[19] This argument might sound as an idealization. However, I wrote this notion in relation to my experience as an audience member.

1.4 Repetition and adaptation to physical space

1.4.1 Openness and repetition

The physical surrounding space where a piece is performed can be understood as our real physical context. If immersion aims at producing an enhanced experience within a real physical space, what occurs to a musical work when it is performed in different spaces? The listener who witnesses more than one performance of a work in different places is able to perceive the mobile qualities of a work in relation to physical space. Does mobility in relation to physical space affect our ability to immerse? Does the intention of creating an immersive experience imply the need to create mobile forms? Does a mobile work affect the way the work is perceived? Does a mobile work aid at producing an immersive experience?

The basic notion of *openness* is that every work of art provides a plurality of readings and interpretations, as art works (and also many objects and situations that we encounter in everyday life) do not and cannot intend to send objective messages with a single meaning. From the point of view of a neutral observer, we can say that even in a single performance, any work of art can be considered as open, as each listener will relate to the experience in their own particular way. In this sense every artistic event is an "open work". *Openness* is an intrinsic characteristic of art.

In *The Open Work*, Umberto Eco also identifies this intrinsic open nature of art. However, his main contribution is the association of "open work" to works that have structural elements which are mobile, unfinished or not clearly defined. In these works the performers are considered as an essential part in the completion of the work. Eco also proposes the concept of "works in movement" or "mobile work". These are works which "consist of unplanned or physically incomplete structural units" (Eco 1989: 12). Works in movement are works in which their instructions and musical material are responsible for the renewal, from performance to performance, of the structural result.

Despite his poetic and phenomenological reflections, Eco mainly focuses on the work's open structural characteristics when he reflects about openness in musical pieces. The musical works used by Eco to underpin his arguments explain "openness" through the study of structure and not through a phenomenological study. In the cases of Berio, Stockhausen, Pousseur, and Boulez, presented in *The Open Work,* there are different propositions for structural openness. In these referenced works, the open variables influence the narrative result: the length, choosing the order of fragments and motifs, or keeping notes or pauses as long as the player wants. These limited freedoms are always related to form, length, and structure. With these, the performers perceive a formal and aesthetic responsibility towards the works. In this sense, the responsibility of completing a piece makes the performers perceive themselves as collaborating composers, who are essential for the result of the performed work. Each performer will give form in his/her own fashion according to his/her formal intuition and musical taste.

Repetition aids the performers to expose and experience through music the open characteristics mentioned above. Through the performance of mobile works, the audible exposition of openness is generally more evident. Mobile works "offer themselves not as finite works which prescribe specific repetition along given structural coordinates but as 'open' works, which are brought to their conclusion by the performer at the same time as he experiences them on an aesthetic plane" (Eco 1989: 3). The proposed mobile characteristics of a work are consciously experienced by the performer during the performance, study and rehearsal period of the piece. The open elements lead the performer to have a dynamic approach that influences the aesthetic result of the work. This might affect the attitude of the performer and the resulting characteristics in a single performance. The fact that the performers know that a mobile work can result in different forms makes them perceive each performance as a more personal and exclusive event. The perceived uniqueness of a single performance contrasts with the sense of multiplicity that mobile works offer. Each performance can substantially differ from one another. From this perspective, mobile works offer the possibility of producing diverse "singularities" rather than repetitions. The term "mobile" implies the presence of structural changes from one performance to another. If the work is performed once, what the performer experiences is the embedded sense of mobility that the work offers but not the representation of the mobility. The representation of that mobility can only happen in repetition. This applies for both the performers and for the audience. Generally, listeners remember their musical experiences as particular and framed events. This isolation of the event also occurs in works that have a mobile characteristic. For the listeners to recognize the mobile qualities of a piece, it is necessary for them to participate in the presentation of it more than once. Acknowledging that a work has more than one experiential nature can only happen for an audience when it is able to listen to more than one performance.

Karlheinz Stockhausen took into account this problem in his mobile work *Klavierstück XI*. The pianist David Tudor "gave the premier of *Klavierstück XI* on 22nd April 1957 at the Carl Fischer Hall in New York, playing two versions that were very different in length" (Kurtz 1992: 87-88). The different lengths of the two versions elucidate clearly the variability of the work. In the performing directions of the score, Stockhausen indicates that the piece "should if possible be performed twice in the course of a programme" (Stockhausen 1957: n.p.). This shows the intention of the composer to justify the use of mobility by revealing it to the audience through repetition. Then the audience can be aware of the exclusivity of each performance, and at the same time they are given the possibility to recognize the nature of the variable aspects of the work. The intended repetition of a mobile work in a single concert compels a player to take into consideration the mobile characteristics of the work and to actually experience the formal mobility. The need to repeat the work imposes a sense of commitment on the interpreters' side to make themselves responsible for the mobile mechanisms of the piece. In this sense, repetition seems to be the most logical solution to justify the use of mobile elements.

On the other hand, if a mobile piece is performed only once then the function of the mobility exclusively stays in relation to the performers' live experience affecting their character and performative attitude. This suggests that the intention of creating a mobile work can also be thought of as generating a dynamic relation between the performer and the piece that affects the aesthetic effect due to the projection of the attitude of the performer rather than through the spontaneous structural results of the music. However, in any musical performance the performer determines the characteristics of the result. An open work suggests that the originality and uniqueness of each performance is granted in the multiple possibilities that the composition offers. In this way, the performer might not be burdened by the same heavy aesthetic commitment that a piece with a fixed score requires.

In a work that is not mobile, the variability between two performances might also reveal a big diversity of changes. The encounter of a particular personality (the personal characteristics of each performer) with a fixed work elucidates unique and distinctive subtleties that the listener can perceive as the traits of the performer. We are able to recognize who is playing through these traits. We are also able to recognize through a fixed form the differences between two performances of the same piece by the same performer. The fixed form of a work contrasts with all of the changing variables that condition the result. The repetition of the fixed in opposition with the changing variables makes us recognize the differences and perceive repetition as change. Repetition is revealed through opposing forms, as Gilles Deleuze describes:

> If repetition exists, it expresses at once a singularity opposed to the general, a universality opposed to the particular, a distinctive opposed to the ordinary, an instantaneity opposed to variation and an eternity opposed to permanence (Deleuze 1994: 3).

From this perspective, the repetition of an identity (musical work) which contrasts with a transforming and surrounding continuity (environment) enhances the focus in the changing reality that surrounds the repetition. The environmental changes that are perceived in a repetition differ from the changes perceived when two consecutive different objects/events are presented. The second object is perceived as a "new" one that establishes new relations with the surroundings. The differences that occur in repetition can be perceived as transformations within a particular space. The repeated event works as a referent to what transforms in relation to it.

In this sense, repetition cannot be understood as the return of an identical object, but in a Deleuzian sense, where repetition is the return of "what differs from itself". From this point of view, the inherent characteristic of a work of art of providing a multiplicity of interpretations, which is one of the main characteristics that define an open work, can be associated to the notion of repetition as difference.[20] "The work" refers to "itself": a singularity and an identity that can only reveal a difference when we recognize this identity. A single event offers an undefined diversity of possible interpretations and each listener will relate to the event in their own way. However, individually, difference or an individual new interpretation can only be experienced in time and in repetition. "Difference inhabits repetition" (Deleuze 1994: 97). "Difference" can be perceived as a representation of "openness" in repetition.

In *What about Woof?* the physical space determines the variability of the technical requirements of the piece. Space can be considered as a mobile aspect in relation to the fixed score and to the specific visual requirements of the piece. From this point of view, the contrast between fixation and the variability of the possible surroundings imprints a mobile characteristic to the work and its repetitions. [21]

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[20] This notion can be associated to our perception of any musical work. However, through open works the musical exposition of differences through repetition is more evident.

It is not common to see in the instructions of a musical score specifications on how to deal with the possibility of different spaces.[22] In *What about Woof?*, the projection setup always demanded a change of the original spatial and visual design for each new venue. The specificity of the instructions always had to be adapted to the possibilities of each space. Each space determined the visual and sonic characteristics of the performance, creating significant differences between each performance.

What about Woof?'s homogeneous sound texture that results from the coins rubbing the tables permeates each space without imposing a traditional musical identity. The visual setup and its relation to each physical space are responsible for the renewal and creation of each particular identity. *What about Woof?* works as taking a sounding mirror to different rooms. The mirror will always show the reality created by the external referents, or by the physical characteristics of each space. The homogeneous sound texture creates a continuous timbral environment. The structural and rhythmic characteristics of the piece arise from within this timbral environment. The rhythmic contrasts of the piece reaffirm the continuous presence of the timbre. Within this timbral continuity other aspects of the performance (spatial, visual, resulting illusions and/or conventional elements of the hall) may interact and appear amplified through sound. These characteristics reveal an intangible identity. The identity resides in the way the piece operates (as an audiovisual illusion interacting with physical space) more than solely in its physical appearance and sonorous form. As a consequence, *What about Woof?* can be thought of as open and immersive for the listener.

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[21] It is important to note that I place emphasis on the variables created by the change of physical space due to the significance of it in this specific work, being aware that every performance is affected by multiple variables such as the weather, the time of day, the mood and mental state of the performers and listeners, etc.

[22] When I composed *What about Woof?*, I did not think of it as a site specific piece, nor as a mobile piece, and I expected that its setup could be placed in any hall. Therefore, it is important to clarify that initially I perceived my piece as portable disregarding the changes of physical space. In sound art, it is more common to witness a concern in the surrounding architecture and its possible variations.

1.4.2 Descriptions of *What about Woof?* in diverse spaces

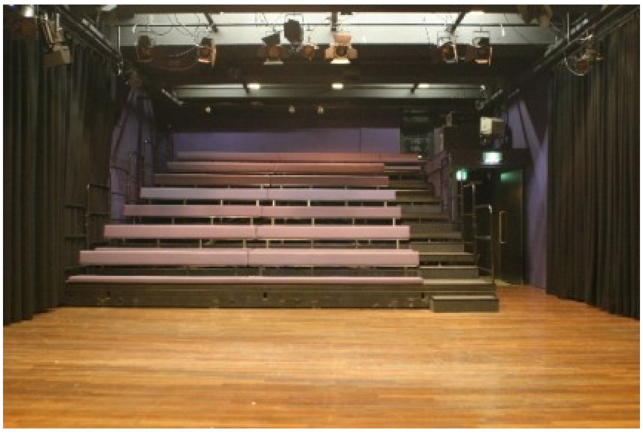

Figure 3 Small hall, Theater Kikker, Utrecht

In the Muziekgebouw aan 't IJ in Amsterdam (Figure 1, page 19), the camera clearly projected the area of the audience, producing the mirror effect as described in the previous subchapter "The mirror setup". This also occurred in the performances of *What about Woof?* in the small hall of Theater Kikker in Utrecht (Figure 3).[23]

The perceptual differences between the Muziekgebouw aan 't IJ and Kikker occur due to the different sizes of the halls and this is reflected in their resulting different degrees of intimacy. In the Muziekgebouw aan 't IJ, the stage is raised above audience level. This creates a first level of separation and distance between audience and performers. The screen was placed at the back wall of the stage far from the performers, and even farther from the audience. All the reflecting immersive phenomena described in the previous sub-chapters occur in this performance. Nevertheless, the big size of the hall maintained the presence of the conventional duality that exists between the stage and the audience. In this way, the perceived reflection is pervaded by a sense of "I am there" rather than "I am here, being reflected". This does not mean that one cannot immerse and eliminate this dualism, but there is a stronger influence of a conventional dualism when the physical separation is clearly present. In the case of the small hall of Theater Kikker (Figure 3), the stage is a continuation of the descending stair form of the audience platform. In this performance, performers and screen were very close to the audience. As a consequence, the audience members could clearly see their reflections. Their presence was more integrated to the events happening on the screen. The sound was amplified as in the original setup. However, the proximity of the tables allowed the audience to listen to the acoustic quality of the sound. The speakers placed behind the players were softly amplifying the instruments and as a result they did not override the acoustically produced sounds. The performance at the Kikker offered a more intimate space where virtual distances were blurred through an acoustic color that revealed the dimensions of that space, and through a mirrored proximity which gave the option to the listeners to also focus on themselves.

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[23] Unfortunately I do not have a picture of the performance. Figure 3 will serve as reference for the following description.

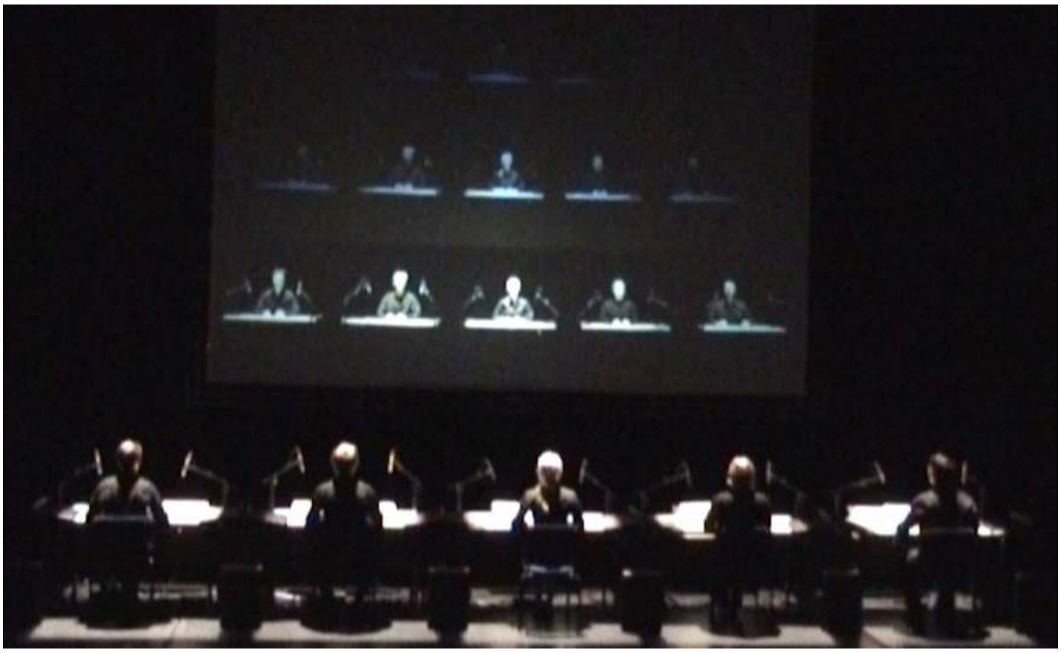

Figure 4 *What about Woof?* Stage setup in the Kees van Baarenzaal, Koninklijk Conservatorium, The Hague.

In the Kees van Baarenzaal in The Hague (Figure 4), the depth of the stage allowed me to place the camera far behind the screen. This allowed the camera to film the performers and the lower projected image of the screen simultaneously, creating a loop repeating the image above the main lower projection. In Figure 4 it is possible to see how the projection resulted in three projected levels that looks like a pyramid form, that begins from the position of the real players until the smallest reflection of them on top. This creates an interesting virtual illusion: the two highest lines of players on the screen could be a reflection of real players situated in the area of the audience. Through this illusion, the audience can feel that imaginary performers are sitting among them; where the audience should be reflected there are players. The light from the repeated versions of the performers made the small portion of filmed audience (lower rows) almost invisible on the screen. As a consequence, the sound perceived and the illusion of imaginary players can give the sensation that the sound is produced in between the audience and by more than five players, amplifying sound through vision. The extra players reflected at the top of the screen create a *ventriloquist effect*, where we perceive each reflected row of players as producing sound. From this point of view, this phenomenon can be described as an immersive illusion. The audience is supposed to be visible in the top rows but instead of seeing themselves clearly, they see a reflection of the players. The audience may feel reflected as performers, simultaneous with the fact that the performers share with the audience the same orientation in the same real physical space. As a consequence, the audience becomes immersed through the "pragmatics of the mirror" accepting that they are reflected as "differents" (as performers). Despite of this transformed identity they can still perceive themselves as being the reflected "referents". This occurs due to our acceptance of the illusion in relation to our presence as referents. To further explain the pragmatic attitudes towards mirrors, Umberto Eco describes how we relate to mirrors when we know that there is an illusion present:

> The case where we know that we are in front of a distorting mirror, as, for instance, at a fun fair, tends to be more interesting.
> Our attitude is therefore double: on the one hand, we find it amusing; that is, we enjoy the hallucinatory characteristics of the medium. We therefore decide (for the sake of playing) to accept that we have three eyes or an enormous stomach or very short legs, just as we accept a fairy tale. In reality, we give ourselves a sort of pragmatic holiday: we accept that the mirror, which usually tells the truth, is lying (Eco 1984: 217)

As we give in to proposed illusions that we are aware of, we also allow ourselves to be immersed in the virtual qualities of this reflection. In this way, the virtual effects that occurred in the Kees van Baarenzaal resemble more the pragmatic experience of a computer screen than of a mirror. There seems to be a digital illusion. However, the illusion is physical. The screen impedes the camera to film the audience. Therefore, there is no actual reflection of the audience. Nevertheless, as Eco proposes, the audience gives in to the illusion and plays with it without needing to know exactly how it occurs. This pragmatism can also be associated to the notion proposed by Frances Dyson, that immersion is obtained by diminishing the critical attention towards the apparatuses that produce the sensorial stimuli. From this point of view, pragmatism can be thought of as a way of not questioning the mechanisms responsible for the perceived stimuli, and as an attitude that leads to immersion. Our immersive entrainment with the way new media operates ("the ability to 'enter the screen', to interact with three-dimensional images or 'virtual objects', to acquire a new subjectivity, a liquid identity, to enjoy authentic rather than mediated experience, and to transcend the material" (Dyson 2009: 3)) increases and conditions our receptive attitude towards visual illusions. As a consequence, the physical effect that produces the illusion of the repeated row of players does not interfere in the perceived interaction between the visual illusion and the physical space.

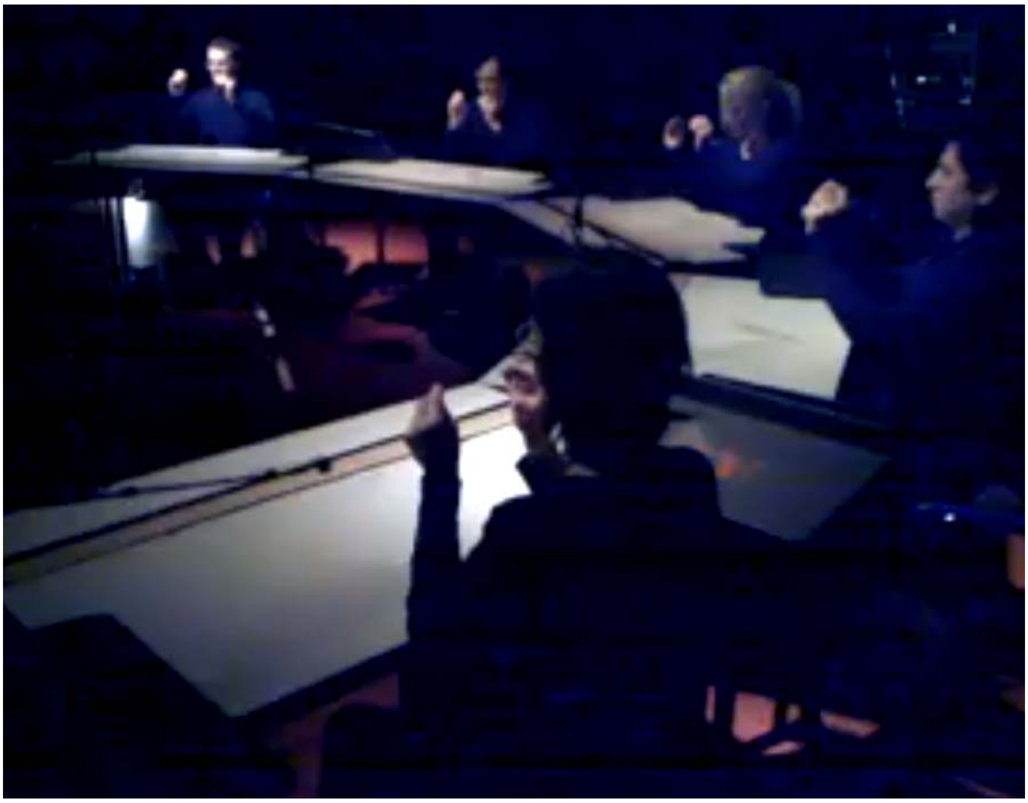

Figure 5 *What about Woof?* Stage setup in Paard van Troje, The Hague.

In the small hall of Paard van Troje (Figure 5) in The Hague, the stage did not have enough depth to place a camera, nor the width to place the five tables beside each other. The tables had to be placed below, in the area of the audience, and facing the audience. The tables were placed beside each other forming a curve as can be seen in Figure 5. This setup does not resemble the original mirror design and returns to a conventional frontality. There is no visual illusion, and the audience's proximity allowed them to recognize what produces the sounds. The performers commented that they enjoyed the real visual communication, and that it made them feel more comfortable and relaxed in the performance. The physical proximity between the players and the audience created an intimate and ritualistic context. The acoustic quality and the lack of virtual elements of the piece resulted in a very different experience.

The performance in the Paard van Troje seemed to be composed with completely different experiential goals than the other versions. The intention of the piece seemed to be completely different than the original. In this case, the physical space forced me to transform the original setup, changing some of the essential original characteristics of the composition.

The differences between the above commented versions are all related to a visual aspect of the piece that transforms substantially how the piece is perceived. The fixed temporal form of the score and the visual specificity opposed to the diverse physical surroundings resulted in very different experiences. These differences reveal how a musical piece not only presents itself as an aesthetic identity, but also as a medium to perceive the characteristics of each surrounding space. When a particular audience sees the performance more than once in different spaces, they are able to perceive and include space as an essential factor in their memory of the piece. Spatial elucidation situates the audience in an immersive context. The surrounding physical spaces function as structural extensions of musical compositions. Music is transformed by space and vice-versa. In the case of *What about Woof?*, the visual setup enhanced the perceptual awareness of space, and this also increased the feeling of being immersed in the physical reality.

Musical pieces are affected by the characteristics of the physical spaces in which they are performed. Comparatively, *What about Woof?* only presents gradual differences with other musical works. In *What about Woof?*, the required adaptations and resulting transformations of the visual setup from hall to hall reveal and enhance the role of the physical space in the perception of the piece. The impractical characteristics of the piece’s setup reveal themselves as mobile elements. As a result, the spatial mobility of *What about Woof?* can be perceived as an intentionally composed element of the work and not only as a random result of the different spatial conditions of each hall. It is important to mention that I did not compose the piece considering physical space as an essential mobile element. The notion of spatial mobility arises from my experience as a listener of the piece in diverse occasions and places. The diverse results of the piece made me realize how a fixed score can be approached to produce sonic variations from space to space. This listener-composer experience influenced my approach on physical spatial in my later works. *What about Woof?* suggests that it is possible to intentionally compose mobile elements that interact with and are affected by the physical characteristics of the performance space. Repeating the performance of such a work in different halls would aid to amplify and reveal the effects of the mobile elements. Nevertheless, if the piece is not repeated, it already would have been devised under this spatial concern, probably affecting its perceptual and aesthetic result.

Stockhausen could also have written a fixed musical score which aims at an open result, with instructions that say: to be performed twice, first in hall X and then in hall Z. In a hypothetical case like this, the open aspect is space and the perceptual transformation from hall to hall creates an immersive effect. To think and present space as *mobility* aids us to achieve a multilayered immersive experience. When we listen to the same musical piece in different spaces and occasions we are able to feel the spatial transformations that the interaction of the piece and space are producing. As a consequence, immersion through music can enhance and transform our perception of physical reality.

1.5 Reflection

As a composer, I considered it necessary to write this chapter to rethink the visual context where sound occurs. The visually charged environment affects the way we perceive sound. Visual aspects of a piece might frame how we perceive sound. Awareness of the visual context can redefine a sonic experience.

In *What about Woof?*, there are no established hierarchies between sight and hearing, nor between real and musical space. This piece reflects the conflicts and interactions that appear when confronting, in an incongruent way, introjected perceptual behaviors. The visual focus of *What about Woof?* and the specificity of the mirror setup always creates a confrontation with its surrounding space. As a result, this piece reveals various conflicting and interacting aspects between sight and hearing, and between virtual and real.

In today's overloaded cyberculture, our relation to visual media is deeply introjected. The relation to computer, cinema or TV screens offers an uncountable diversity of experiences in which we do not observe critically the screen as an object. As I type on my computer, the white area to write in offers itself naturally as a virtual writing space. In this context, vision operates in an immersive manner. As we move our eyes out of the screen we naturally shift towards a visual reality. When we return to the screen our experiential shift towards the virtual space is almost instantaneous. We (computer users) have entrained an almost automatic visual immersion in computer screens. We immerse and emerge back and forth constantly from the world of the screen to the world outside of it. We accept and experience naturally the realities in the screen and the ones outside of it.

Blending Dyson's immersive ideas with the adaptive notions proposed by Ruth Herbert invites me to think that shifts between virtual worlds and reality are experienced in a realm of normality. The visual aspects of the world make us perceive virtuality as reality. Constant shifts and interactions between different sensory realities are normal characteristics and traits of our everyday experience. As a consequence, it is almost impossible to establish experiential hierarchies of what is real and what is not.

The musical experience of *What about Woof?* also reflects the comfort of being framed. Framed in vision, score, or a kind of sound. Openness resides in the clash between these frames and reality. And in this clash we immerse in a space between worlds that is actually the world perceived with all the senses. Our virtual, real, aesthetic and physical notions blend when the tension between all of the aspects of performance is taken into consideration. We have to be careful to not fall or be drawn into specific hierarchies.

Composers and performers are unconsciously dragged into the historical "frame" of the visual world, the "score", the "stage" and the "sound", many times losing reference of the relations that arise between them. *What about Woof?* is the result of conflicting and interacting elements. These conflicts and interactions reveal the tension between musical and physical reality. The sense of individuality or dissociation that can arise from framing or hierarchizing aspects in performance is dissolved in the plural context of conflicting and interacting elements, as in *What about Woof?.*

As seen in *What about Woof?*, the visual changes that occur from hall to hall affect the way the piece is perceived. Because of the introjection of aural behaviors, space must be considered as an essential role in the design of immersive environments. Physical space can be approached as an influential factor to transform our perceptual automatisms. The following chapter will delve in these notions mainly focusing on the phenomenology of spatialization.

Chapter 2

On *La línea desde el Centro*

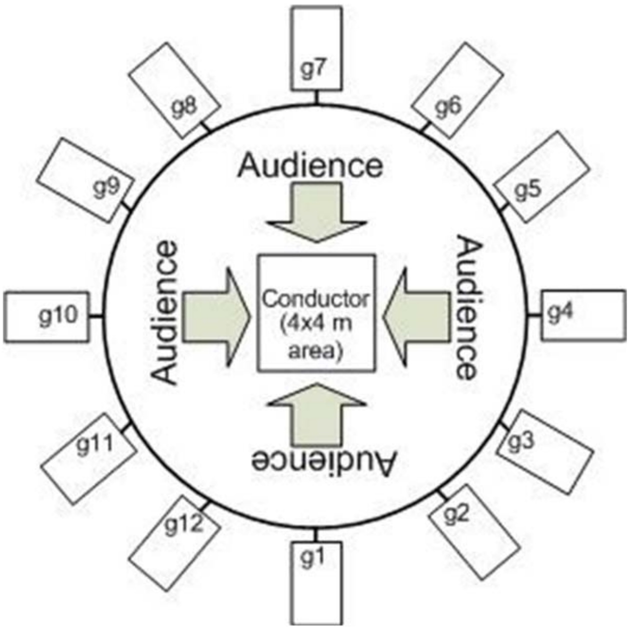
g7
g8
g6
g9
g5
Audience
Audience
Audience
Conductor (4x4 m area)
g10
g4
Audience
g11
g3
g12
g2
g1

Figure 1 Stage setup of *La línea desde el Centro.*

2.1 Introduction

La línea desde el Centro (The line from the center) is a composition for twelve guitarists and conductor that I wrote in 2007. The audience is surrounded by twelve guitar players, and the conductor is placed in the center of the circular setup (Figure 1). As indicated in the figure above (arrows) the audience must be facing the conductor.

In what kind of physical space must this composition be performed? Should the physical space be considered as part of the composition from the beginning of the creative process? Composition and musical parameters can be easily observed from and treated in their isolated virtuality in the same way that an immersive experience can be isolated in the description of individual sensations. When Neruda wrote his poems, did he contemplate the possibility of a reader reading his poems in a toilet? He probably trusted in the quality of his works disregarding their physical context. His works do not specify "to be read on a mountaintop" or "to be read in a small room with candle light". They can be read anywhere, and the quality of the work should adapt to any possible surrounding context. It is more and more common to take site-specificity into account, although it is also quite normal that composers do not demand where their pieces are going to be performed. In these cases, musical forms and gestures might be perceived by composers as enough to guarantee the perception of a virtual musical space. A musical piece can be performed in different spaces and the qualities of the work will have to adapt to the diverse spatial possibilities. This notion can be seen as a traditional and common approach for a composer. However, physical space can be considered as an essential musical parameter, and the acknowledgement of environment as a conditioning factor for musical experiences can significantly affect the aesthetic result of any given work. I acknowledge that this spatial concern is not new. Nevertheless, my compositional goal is not to aim at creating a separated virtual experience with spatial impressions, but to use space to blur the separation between virtual and real spaces. This approach will reveal new attitudes and perspectives in relation to spatialized music and conventional musical situations. It is important to mention that my concern is more oriented towards exploring the problems that occur in conventional spaces such as halls, theatres, and studios that are usually used for musical practice. For this reason, I will differentiate and relate sound art perspectives that have more diverse uses of space with practices that are related to a concert music tradition. Further on in this chapter, I will argue that in a habitual circumstance, it is easier to break conventions and to create new perceptual situations.

In a similar fashion to the previous chapter (On *What about Woof?),* this chapter begins introducing notions that arise from studying and reflecting on the experiences of *La línea desde el Centro* (from now on I will refer to it as *La línea*) without using the piece immediately as a reference to contextualize the ideas presented. Descriptions of how the work is associated to these notions become more prevalent towards the end of the chapter. The last subchapters, describing some of the processes of *La línea,* intend to show the compositional origins that gave birth to the ideas proposed. Additionally, this description of processes will be used to elucidate my approach towards the idea of "openness" and its relation to immersion.

2.2 Spatiality: a process towards immersion

2.2.1 Virtual and physical space

One of the main aspects that condition the occurrence of an immersive experience is the relation between listeners and the surrounding physical environment. The surrounding architecture resonates with and involves the listeners. When a sound is heard in a hall, it reveals the size and echoic characteristics of the space. The sources and the sounds produced can be located inside or outside the hall. The listeners recognize the difference between what is inside and outside. The differentiation of spaces makes them feel, consciously or unconsciously, "part of" the area where they are located, whether they are located outside or inside of a framed space. The sonic and physical borders define the kinds of sensorial characteristics that the space can offer. The perception through listening of the physical frame or environment is a form of self-representation. Inside a big hall or a small hall, circular or square, outside in the countryside, standing outside a sounding music hall or in a street, silent or noisy, the listeners interact with their surrounding space giving form to the way they listen what they are able to hear. The form of the space moulds the way we resonate in/out/with it. Self-representation in space is not necessarily something that listeners are conscious about during music listening. Listeners naturally experience the differences of each physical context often without conscious awareness.

Through music, the listeners can experience a virtual immersive landscape. They can detach the virtual perception of music from their awareness of the real physical space. The Danish musicologist Erik Christensen developed a theory of music listening in his book *The Musical Timespace,* where he proposes and classifies "listening dimensions" that interact simultaneously, creating a virtual musical space. He summarizes his model as follows:

> ***The virtual timespace***
>
> States and events, movements and transformations of musical sound evoke impressions of space. This musical space is a virtual space, which is completely integrated with musical time. All kinds of spatial impressions, rise and fall, movement and growth, shapes and patterns, are called forth by temporal changes of sound qualities. The musical space is a virtual timespace.
>
> The virtual musical timespace is evoked as a mental illusion by the experience of differences in Intensity, Timbre, Pitch height, Movement and Pulse. *Timbre* and *Pitch height* are microtemporal dimensions. In the temporal continuum, Pitch height represents the experience of *microtemporal regularity,* and Timbre represents the experience of *microtemporal change. Movement* and *Pulse* are macrotemporal dimensions, evoking the experience of time. Movement represents the experience of *macrotemporal change.* Pulse represents the experience of *macrotemporal regularity.* (Christensen 2009 3)

To graphically represent and summarize the relations between the macro and micro listening dimensions, Christensen presents the following figure:

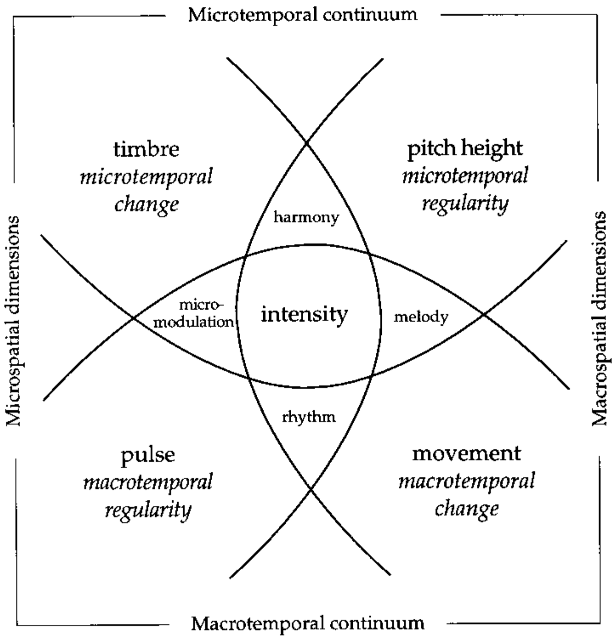
Microtemporal continuum
timbre
microtemporal
change
pitch height
microtemporal
regularity
harmony
micro-
modulation
intensity
melody
rhythm
pulse
macrotemporal
regularity
movement
macrotemporal
change
Microspatial dimensions
Macrospatial dimensions
Macrotemporal continuum

Figure 2 The microdimensions and macrodimensions of the musical timespace (Christensen 1996: 153)

The interaction between the nine musical dimensions creates a virtual time-space. As described in his summary and in figure 2, the musical dimensions refer to parameters that are only perceived and that can only be classified through listening. Christensen does not consider physical space in this model. As a consequence, the sensory and psychological perspective of the model emphasizes the separation of the virtual time-space from physical reality. The musical dimensions design metaphors of physical space. The dimensions do not need to be observed in relation to physical space. Unfortunately, it is common for composers to think of and write their music only considering the musical dimensions. The physical space and the performance context tend to be a concern that is confronted at the last minute.

In many occasions, I have realized how a given space has affected the perception of my idealized musical time-space. I found myself changing my compositions to enforce an expected virtuality over the given physical conditions. For instance, a very reverberant room can decrease the ability to perceive fast articulated figures. Also, an instrument's timbre can blend well (as expected or imagined) with other instruments in one space, while in another it is perceived as separate from the group, not creating the expected resulting timbre. Therefore it is essential to acknowledge that the virtual musical dimensions are conditioned by physical space.

"Evoking impressions of space" and "evoked as a mental illusion" are phrases that refer to transformations in the conscious state. The musical time-space may induce the listener to achieve an immersive state. The perception of a virtual space can be understood as the experience of an immersive conscious mode.[24] Nevertheless, the real physical space provides a set of environmental characteristics that condition a virtual experience. Immersion can be misleadingly understood and approached from an isolated psychological perspective where the reference to a real physical environment is suppressed. Music mediates the way we perceive reality. In this case, I am referring to reality as a given situation where music is initially absent. The mediation begins when music appears and overlaps with the given sensory characteristics of the environment. Once music begins, we perceive it as a virtual phenomenon. As music continues it can blend with the environment and be perceived as part of reality, or it can become reality as the listeners immerse into the musical space. In both cases, "mediation" implies that there is an original environment that is being transformed. However, even when music becomes reality we cannot ignore the presence of the physical environment. Music always appears as a contrasting substance that transforms the way we perceive the environment.

The sensation of real space will transform the way in which we perceive a novel; if we read it in our bed, or if we read it under the sun on a beach, or if we watch a movie in our living room on a laptop or in the cinema, each experience will be conditioned by the environmental and physical characteristics of the surrounding space. Frances Dyson describes the phenomenology of space in relation to how we associate the virtual with real spaces through the use of new technologies that aim at creating virtual realities:

> Space acts as a pivotal element in this rhetorical architecture, since it provides a bridge between real and mythic spaces, such as the space of the screen, the space of the imagination, cosmic space, and literal, three-dimensional physical space. Space implies the possibility of immersion, habitation, and phenomenal plenitude. (Dyson 2009: 1)

As mentioned in the quote above, immersion cannot be experienced in the absence of space. What is essential for Dyson is that the body in this immersive new context feels totally enveloped and surrounded by space, whether this space is perceived as real or imaginary, in relation to the physical space or not. It also implies that certain stimuli can create a virtual or imaginary space. Nevertheless, immersants cannot separate their sensory experience from the physical environment, so any form of immersion, physical or imaginary, will resonate with the physical space and its characteristics will condition the way in which immersion is experienced. Although Dyson appears to be aware of the relationship between physical and virtual spaces, through her book the reader will perceive the notion of full immersion as a "new" state or condition which arises within the virtual phenomena. The sense of "new" can be associated to a simulation, a separation or an extension of reality.

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[24] The title of Ruth Herbert's *Everyday Musical Listening: Absorption, Dissociation and Trancing* introduces the three main conscious modes that she will use to describe the psychological effect of music listening in everyday life. I am referring to these modes as immersive. I will delve specially in the terms absorption and dissociation in Chapter 3 "On *Eufótica*".

Although she describes from diverse perspectives the cultural and ontological implications and effects in the perception of reality that arise from immersive phenomena associated to new media, the sense of "new" invites us to perceive immersion as a virtual transitory event. From this perspective, we may understand the notion of reality as a group of separate and different realities. My intention is to redirect the focus on immersion as an event that occurs within reality. Immersion can be understood as a transitional experience where there are given sensory conditions that continuously transform reality. In this way, "to immerse" and "to emerge" are thought of as resonance and continuity. Physical space needs to be an essential parameter in the design of "a perceptual continuity".

In the case of *La línea,* the physical surroundings were always kept as the main spatial reference. More than aiming at creating a new or virtual reality, the goal was to create a subtle transformation in the perception of the surrounding physical space. The presence of a transformation implies that in the musical context an aesthetic virtuality overlaps with the real space. This happens in all musical contexts. However, in *La línea* the intention was to equalize the roles of the virtual and the physical, creating the sensation that what is being experienced is a transformed reality. From this perspective, the relation between the musical and the physical space cannot be seen as a dialectical confrontation between the virtual and the real. Therefore, when the musical stimuli end, the listeners do not perceive a re-entering into reality, but a transition within a continuous and transforming reality.

As mentioned earlier, it is common for a composer to begin a musical creation having only as reference the virtual musical time-space. Composers commonly take for granted that the virtual characteristics of music are the ones that will mediate our experience and transform our perception of reality. From this perspective, there seems to be no need to have the physical space as reference, as in this case, music is intending to create its own virtual space. The musical characteristics will have to adapt to any given performance space. On the other hand, within a traditional musical practice it is not common to begin with the perspective that space is the mediator that conditions the form of a musical experience. The consistency of the physical space can be perceived as a complication that contrasts with the abstract and immaterial characteristics of sound. Physical immersion implies the presence of a physical surrounding context. For this reason, during the process of designing an immersive environment the composer needs to give equal attention to both the physical and musical spaces, leading to the possibility of relating them to each other in new ways.

The limits of physical space aid in achieving an immersive experience. When we enter a warm small room, a big church, or a tunnel, we immediately perceive a sensorial transformation, our senses perceive the changes of the new physical space. In this sense, entering or coming out of framed spaces can be perceived as immersive transitions. Nevertheless, in a musical context, the cultural traditions standardize certain attitudes and expectations. Entering a concert hall contains a historical and cultural conditioning. In a traditional setting when a listener enters a music hall, the expectations are focused towards the forthcoming musical event which will happen in a specific area of the hall. The focus will be towards the place where the sound sources are located. In these cases, there is no need to pay attention to the acoustic and physical characteristics of the space. In this way, we can understand that the traditional duality invites a comfortable context for immersion. The space conditions the sound results, but this does not usually capture the listener's attention.

The moment in which the music begins is the moment when the sensorial relations between sound, space and the listener begin. Before that beginning, the movement of the audience towards their seats occurs in an automatized and logical way. During this process, the listeners are not necessarily feeling a big perceptual contrast with their lives outside of the hall. This is because the gathering of people in a certain area is what should normally happen. This gathering implies a transformation of the more individualistic condition that each listener previously had outside of the music hall, but the audience experiences this process naturally as a cultural convention. This cultural automation occurs when the audience is aware that it is being part of a performance. On the other hand, when a person enters into an unknown room or hall without the expectation of an artistic event, the recognition and experience of the space is usually what takes the main attention. In non-artistic contexts, immersive transitions from one space to another occur detached from aesthetic expectations. Detached from expectations, the aesthetic sensations might or might not occur according to wherever we place our attention. Aesthetic appreciations might be randomly triggered by diverse sensory stimuli as in the same way they are triggered in our everyday life. These aesthetic appreciations do not necessarily occur within the repetitive tradition of conventional artistic contexts. The more conventional the architecture of a music hall is and the more conventional the setup of the performance is, the less we pay attention to the physical space as our expectations are focused on the forthcoming artistic event. This argument suggests that the music hall does not present itself as a key aspect in the aesthetic result of the performance. In this traditional approach, the role of the hall is merely functional. It aids the listener in experiencing the virtuality of the presented event detached from the physical reality and presence of the hall. For this reason, a transformation of the concert setting is required to achieve an immersive effect in relation to the physical space. These transformations should occur in relation to the physical disposition of the elements in the concert space, as well as in the way musical material operates and how it relates to the physical space and the listeners' positions.

In *La línea*, the sole focus on physical space transformed the traditional concert setup and conditioned the way I approached the musical material. As mentioned earlier, *La línea* is a piece where the audience is surrounded by twelve guitar players (Figure 1). In spite of seeming to be an intentionally closed frame for the audience, the actual initial goal of the piece was to create a disorienting effect in relation to the space outside the circle. One of the specific intended effects was to create, through the rotations of reference points (pitches), the feeling of being physically rotated. Ideally, I imagined the audience coming out of the circle feeling that they had ended up sitting pointing in a different direction from the one that they were pointing towards in the beginning; subsequently, they would look at the hall (or any surrounding context) and would try to relocate themselves in space. These first ideas reflect how I started the compositional process, having as reference the physical context that surrounds the circle, and the listener's possible perceptual transformation after the conclusion of the piece. To clarify, the piece was not written in relation to a specific site but it was developed as a piece that operates observing its physical surroundings, whatever these surroundings might look like.[25] Focusing on how the piece could relate to its surrounding space and time had a direct influence on the different and unexpected ways in which I developed the musical material, form, type of score, stage setup, and the way that the performers and audience have to relate to these. All of these compositional and performative elements coalesced into a performance of immersive characteristics. When I was invited to write the project that resulted in *La línea,* I had not yet associated these phenomena to the concept of immersion. I associated the term immersion with this piece four years after its premier, and after five performances of it in different settings. The term immersion appeared as a word to describe in a concise way the sort of experience that occurs during this piece. It also served me to describe the differences between this piece and my previous works which have more traditional settings.

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[25] I will continue to develop this issue on this text.

2.2.2 Being and space

La línea is a piece where the performance space is framed within another space. *La línea* gathers all of the participants within a circular area. The hall is not used in its traditional dual setup (audience/stage). Its architecture is perceived as a physical layer that surrounds the performance space. The audience is invited to a different use of the space, within which the most logical and traditional expectations are transformed and conditioned.[26] In a surrounding spatial work, the listener recognizes his position in space in relation to the sounding sources. Each listening position will offer a unique spatial experience. The surrounding sound sources create a referential frame. Surrounding spatial compositions generally aim at creating spatial impressions within the given spatial frame. The characteristics of the hall are often perceived as a complication for the creation of a surrounding virtual environment.

Persephassa (1969, for six percussionists) by Iannis Xenakis is a famous composition with an encircling setup (hexagonal) (Figure 3).[27]

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[26] Redistribution of musicians in space is not at all a new practice. There are many examples of spatial music through history, as within the Christian Liturgies with responsorial and/or poly-choral characteristics, which go back to early Christian rituals and reach developed forms with Palestrina, Gabrieli and other composers of the Renaissance. Also, during the 20th century, spatialization grew as a musical concern. Various uses of space can be found in the works of Karlheinz Stockhausen and Iannis Xenakis. The use of speakers in early electronic music also led to an increasing concern in spatialization.

[27] I worked with an edition of *Persephassa* from 1970.

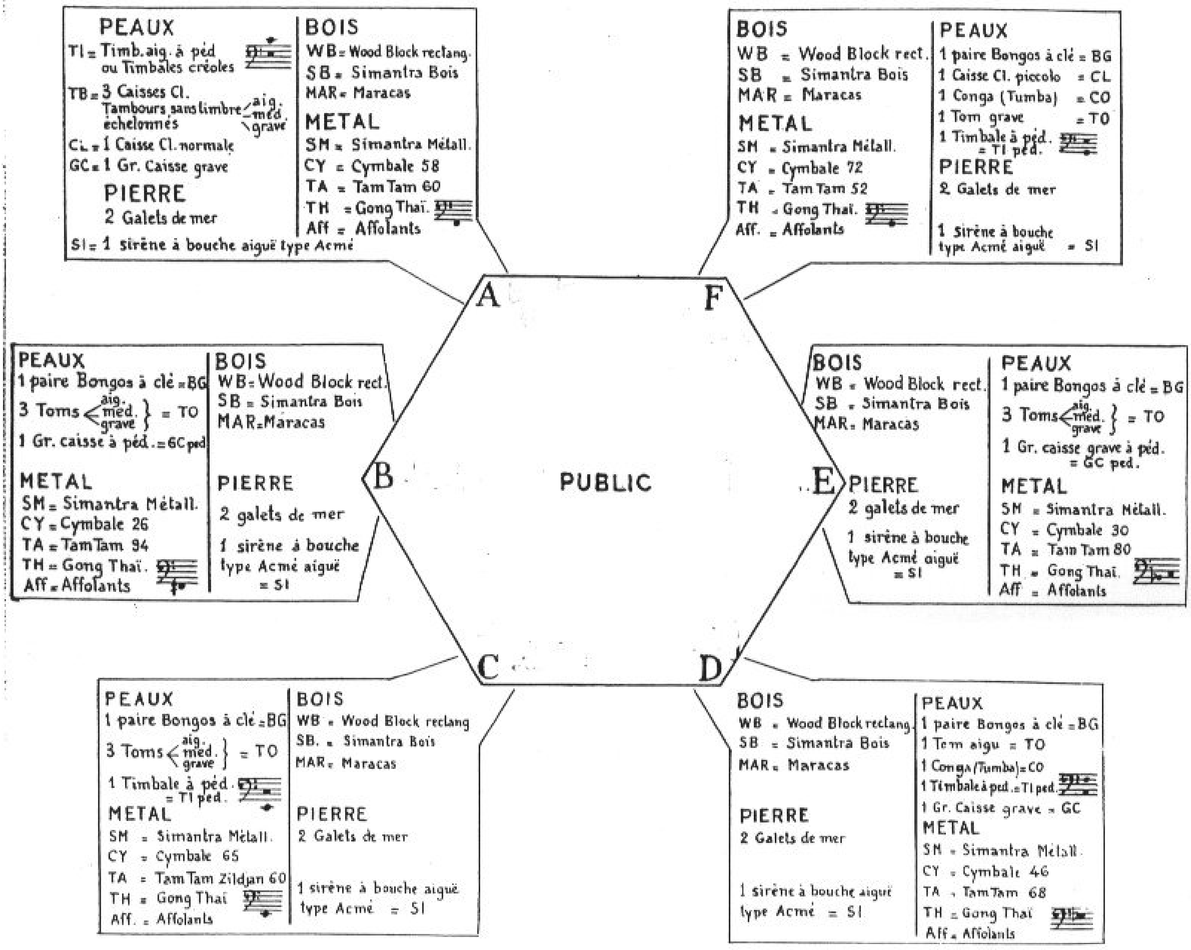
PEAUX
TI = Timb. aig. à péd ou Timbales créoles
TB = 3 Caisses Cl. Tambours sans timbre échelonnés aig. méd. grave
CL = 1 Caisse Cl. normale
GC = 1 Gr. Caisse grave
PIERRE
2 Galets de mer
BOIS
WB = Wood Block rectang.
SB = Simantra Bois
MAR = Maracas
METAL
SM = Simantra Métall.
CY = Cymbale 58
TA = Tam Tam 60
TH = Gong Thaï.
Aff = Affolants
SI = 1 sirène à bouche aiguë type Acmé
A
BOIS
WB = Wood Block rect.
SB = Simantra Bois
MAR = Maracas
METAL
SM = Simantra Métall.
CY = Cymbale 72
TA = Tam Tam 52
TH = Gong Thaï.
Aff. = Affolants
PEAUX
1 paire Bongos à clé = BG
1 Caisse Cl. piccolo = CL
1 Conga (Tumba) = CO
1 Tom grave = TO
1 Timbale à péd. = TI péd.
PIERRE
2 Galets de mer
1 sirène à bouche type Acmé aiguë = SI
F
PEAUX
1 paire Bongos à clé = BG
3 Toms aig. méd. grave = TO
1 Gr. caisse à péd. = GC péd
METAL
SM = Simantra Métall.
CY = Cymbale 26
TA = Tam Tam 94
TH = Gong Thaï.
Aff = Affolants
BOIS
WB = Wood Block rect.
SB = Simantra Bois
MAR = Maracas
PIERRE
2 galets de mer
1 sirène à bouche type Acmé aiguë = SI
B
PUBLIC
E
BOIS
WB = Wood Block rect.
SB = Simantra Bois
MAR = Maracas
PIERRE
2 galets de mer
1 sirène à bouche type Acmé aiguë = SI
PEAUX
1 paire Bongos à clé = BG
3 Toms aig. méd. grave = TO
1 Gr. caisse grave à péd. = GC péd.
METAL
SM = Simantra Métall.
CY = Cymbale 30
TA = Tam Tam 80
TH = Gong Thaï.
Aff = Affolants
C
PEAUX
1 paire Bongos à clé = BG
3 Toms aig. méd. grave = TO
1 Timbale à péd. = TI péd.
METAL
SM = Simantra Métall.
CY = Cymbale 65
TA = Tam Tam Zildjan 60
TH = Gong Thaï
Aff. = Affolants
BOIS
WB = Wood Block rectang
SB. = Simantra Bois
MAR = Maracas
PIERRE
2 Galets de mer
1 sirène à bouche aiguë type Acmé = SI
D
BOIS
WB = Wood Block rectang.
SB = Simantra Bois
MAR = Maracas
PIERRE
2 Galets de mer
1 sirène à bouche aiguë type Acmé = SI
PEAUX
1 paire Bongos à clé = BG
1 Tom aigu = TO
1 Conga (Tumba) = CO
1 Timbale à péd. = TI péd.
1 Gr. Caisse grave = GC
METAL
SM = Simantra Métall.
CY = Cymbale 46
TA = Tam Tam 68
TH = Gong Thaï
Aff = Affolants

Figure 3 Spatial disposition of Iannis Xenakis' *Persephassa*

In this work, Xenakis explores the combinations of periodicities and multiple tempos in relation to their movement in a circular setup. In this process, he aims at creating temporal illusions through the use of physical space. The circle is used as a closed set of points that are combined mathematically to create simultaneous spatial rotations with different speeds and directions.[28] The temporal perceptual concern of the piece reveals the functional character of the closed circle. The circular setup functions to favor the creating of temporal sensations. Each listener inside the circle experiences his own particular temporal experience. This produces a sense of relativity, as the perception of time in relation to the sound sources is different from listener to listener.

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[28] I am not presenting a detailed analysis of the compositional processes. For further investigation, a detailed description of rotational processes can be found in Maria Harley's PhD dissertation *Space and Spatialization in Contemporary Music: History and Analysis, Ideas and implementations* (Montreal: McGill University, 1994), especially in Chapter 7.4, "Sound Rotations in *Persephassa*"(pp. 293-296).

Xenakis seems to negate the linear notion of time. He investigates the relativity of temporal perception as associated to physical space through music and reveals the perceptual interdependency of time and physical space. In my interpretation, the unique position and experience of each listener is essential for Xenakis to describe the simultaneity (the "same" music) and multiplicity (the multiple perspectives from which the music can be perceived) of this temporal/spatial relation. In reference to spatialized music where the players "mingle" with the public, Xenakis comments (extracted from an interview with Xenakis): "The individual listeners don't hear a completely different kind of music, but they certainly hear the same music from a different perspective" (Varga 1996: 98). This statement has immediate ontological implications. A spatialized work of these characteristics offers a space to experience a sense of being "singular plural". The spatial disposition describes a sharing of multiple perspectives within a limited space and within a musical architecture (what Xenakis calls "the same music").

The network of events designed by Xenakis reveals the self-inclusiveness of the hexagonal frame. The perimeter of the hexagon marks the spatial boundaries. The boundaries separate the external structures and aid the listeners to perceive a virtual construction. The sonifications and multiple readings of space in the works of Xenakis reveal the interest of the composer to create a musical architecture that, however related to physical phenomena, creates and is sustained by its own virtuality. In this case, virtuality equals music. Music is then perceived as a temporal-spatial construction. For Xenakis, it is important to give sensations of physical space through a musical practice where the listeners do not need to move physically from their listening positions. In this way, Xenakis uses spatialization to enhance the spatial sensations within the virtuality of the musical dimensions (as described by Erik Christensen).

In the interview with Andras Varga, Xenakis argues: "Space [physical] first and foremost has the task of allowing sound to be heard properly" (Varga 1996: 97). This sentence reveals how Xenakis was mainly concerned with the acoustic functionality of physical space. For Xenakis, on the surrounding disposition of instruments of *Persephassa*: "The acoustic problem is simpler" (Varga 1996: 100). The proximity and involving disposition of the sources avoid the conditioning acoustic effects of the physical space. For Xenakis, the acoustic characteristics given by a physical space have to be tamed in favor of a musical necessity. This is because he does not believe in perfect acoustic conditions. For instance, in reference to his composition *Terretektorh*[29] he states: "There's no hall, however, that suits it perfectly [acoustically]" (Varga 1996: 99). For him, the proximity of the sources is essential so that the listeners perceive the energy from the sound source: "But I emphasize once again: the closer we are to the instruments, the less we lose of their energy" (Varga 1996: 100). In Xenakis' work the spatial disposition has to be designed keeping the sound sources as the main spatial referent disregarding the physical influence of the hall. Proximity reduces the influence of the physical acoustic factors in the perception of the virtual musical space. For Xenakis, music should be able to sustain its own virtual architecture disregarding physical space. This notion could also be associated with how Xenakis imagines that composers think about their music: "It's much more likely that they [composers] consider music objectively in terms of real sounds, rather than from any particular distance, which would be silly […] unless they were thinking of some ideal hall which doesn't exist" (Varga 1996: 99).

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[29] *Terretektorh* (1965/66) is an orchestral piece where the performers are spread in different points within the audience. I will delve about the characteristics of this piece in the next chapter of this dissertation.

The text above mainly focuses on works of Xenakis which are not site-specific. Xenakis' architectural works and site-specific compositions may seem to contradict the arguments mentioned above. In the *Polytopes* (the name of a series of Xenakis' spatial works) he constructs multimedia installations using existing architecture or buildings specially designed for each installation. In the *Polytopes* the architecture is integrated in the compositional process. For example, the *Diatope* (a *Polytope* constructed for the opening of the Centre Pompidou in 1977) is a (theoretically) transportable structure designed and constructed by Xenakis as an integral multimedia installation. In the *Diatope* and the other *Polytopes* the physical architecture blends with the virtual aspects of the sounds. "In the *Polytopes*, there is not really a contrast between the real and the artificial world; what is being dealt with is the creation of temporary transformations or modulations of a given space or site" (Sterken 2001: 271). On the contrary, *Terretektorh* and *Persephassa* are no site-specific works. Their musical setup thus produces diverse forms of spatial interaction depending on the characteristics of each space (as in *What about Woof?* described in Chapter 1).

La línea aimed at creating similar spatial impressions as in *Persephassa* and *Terretektorh*, but the main difference from Xenakis' perspective is that in *La línea* the focus is given to the physical space around the circular frame to create the composition. The virtual spatial impressions that occur in *La línea* do not aim to enhance the sense of spatiality within the virtuality, but rather aim at giving an active presence to the physical surroundings. The spatial sensations should not just be related to the framed area defined by the sources, but it should also affect the relations with that which is outside of it. For Xenakis, these effects were not his main goal. However, Xenakis' settings still naturally offer the possibility to perceive similar sensations and spatial associations. On the other hand, in *La línea* the compositional processes and the sonic spatial effects within the circle are a result of intentionally looking outside of the circle.[30] *La línea* can be understood as looking towards the physical reality from within the musical space of the circle. I did not consider integrating the architecture as an aesthetic or active element nor intended to create a self-sustained virtual space. In that sense it differs from Xenakis' approaches.

In the process of *La línea,* the particular acoustic characteristics of the hall were not studied to achieve a specific sound result. I did not intend to analyze the acoustic qualities of a given space, but to compose the piece while being aware of the perceptual meaning and cultural effect of transitional physical spaces. In *La línea,* the hall works as a gathering space, as an entrance or waiting hall. The hall becomes the reference to reality and a transitional space in between the outside and the inside of the circle. When the piece finishes, the listener gets out of the circular area to the framed space of the hall. As the hall becomes a shared space where the music of the circle resonates, it can be understood as both an exteriority and an interiority. As in *Persephassa*, this occurs because of the sonic boundaries designed by the circular setup. The traditional focal attention towards the sound sources is replaced by the experiencing of a surrounding sound environment. A circular spatial setup creates an immersive context, where immersion occurs in a natural way. The listeners are physically surrounded by sound. However, this does not guarantee that the listeners will achieve immersive conscious modes. Nevertheless, the audience is inside a physical context where, due to the physical implications of their listening, they cannot avoid perceiving themselves in the proposed surrounding sonic environment.

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[30] To illustrate this argument, compositional processes of *La línea* will be described in detail further on in this chapter.

The encircling context reduces the visual focal attention towards the sound sources. It also works as a physical description of the involving characteristics of listening. As already described in the previous chapter, listening and immersion can be associated to a sense of "being in". Our ears listen in every direction. In this way, the perceived spatial distance between the listeners' heads and all of the surrounding sources disappears, physiologically equating the listeners' heads to the perimeter of the circle. Each head becomes the circle. The circle can be thought of as a framed context that describes listening as resonance. This inseparable *contemporaneity* of the sound source and the listener creates a space as sonorous existence. As one listens, one becomes the heard (as described in the pages 25-26 of the first chapter in reference to the arguments of Jean-Luc Nancy). From this perspective, it is possible to suggest that one also becomes the space. Jean-Luc Nancy reflects that resonance makes "the sonorous place ('sonorized' one is tempted to say, plugged into sound), a place-of-its-own-self, a place *as* relation to self, as the taking-place of a self, a vibrant place as the diapason of a subject or, better, as a diapason-subject" (Nancy 2007: 16). In this context, the self does not appear as an isolated singularity but as a self that includes the resonating space. "So the sonorous place, space and place – and taking-place – as sonority, is not a place where the subject comes to make himself heard…; on the contrary, it is a place that becomes a subject insofar as sound resounds there" (Nancy 2007: 17). The experience of listening creates, through resonance, an embodied experience of plurality and disalienation. In *La línea* the listeners become the circle, therefore the hall, therefore the world.

Observing resonance as a representation can be misleadingly associated to a separation from reality, as the separation described by Frances Dyson in relation to virtual environments. As quoted in the previous chapter: "By 'being in', rather than 'looking at', virtual environments, the viewer is said to occupy the space and time, the here and now, the virtual present of a separate but ontologically real space" (Dyson 2009: 2). The notion of separation that Dyson associates to virtual environments does not apply to every listening and immersive context. The sense of perceiving oneself as "being in" inside a circular setup seems to be very natural and is apparently analog to the description of an immersive experience in virtual environments. Nevertheless, the context of an acoustic performance operates differently than in a technologically designed virtual environment. The difference between *La línea* with a virtual environment created through technology is the speed of transformation into an immersive mode. This difference lies in the fact that *La línea* does not intend to be a simulation. A simulation (in technologically based virtual realities) and an invented sound environment have different immersive processes and ontological implications. A simulation intends to offer an immediate transformation while an acoustic sound setup requires a slower process to achieve an immersive mode. For instance, the virtual space we perceive in the computer screen is already there, always available for us. A full-flight simulator can quickly reproduce the sensation of being in a closed cabin in an airplane. With computers and simulators, the experiential shift is almost immediate. On the other hand, with a case like *La línea,* the immersion occurs in a context that does not establish a clear separation from the environment. In this way, *La línea* can be described as a sonorous immersive experience of an undefined kind, that occurs in resonance with the real space. It was not intended to create a virtual reality or a simulation.

The process of achieving an immersive mental mode in an acoustic context requires a transition time. This time is aided by the transitional spaces that are around the circular setup. The transitional spaces can be understood as references to reality. If we are able to perceive or recognize the role of each transitional space, we are enabled to perceive the relations between different but coexisting layers within reality. This implies that the sensation of "being in" an invented immersive environment occurs due to the existence of a contrasting reality. An immersive experience seems to depend on this ontological relation. What does it mean "being in"? Does the ontological character of an invented environment separate the listener from a being outside?

In *Being Singular Plural*, Jean-Luc Nancy proposes that the essence of being is singular and plural. He unites being-singular-plural as a compound term that interrelates simultaneously all the possible meanings of each word. For Nancy, there is no "being itself". "Being" is immediately singular-plural, so it is not possible to approach being as a preexisting individual notion of existence. Nancy proposes that existence is always co-existence:

> That which exists, whatever this might be, coexists because it exists. The co-implication of existing [l'exister] is the sharing of the world. A world is not something external to existence; it is not an
> extrinsic addition to other existences; the world is the coexistence that puts these existences together. But one could object that there exists something [which does not first coexist]. Kant established that there exists something, exactly because I can think of a possible existence: but the possible comes second in relation to the real, because there already exists something real (Nancy 2000: 29).

In this fragment, Nancy proposes that thinking of reality is one of immediate coexistence. From this perspective, it is impossible to think of singular existences if they are not interacting within a reality that is always plural. The realities of the screen, of music, of a book, or of the environment can only be observed as part of an interrelated reality. If we take this argument into consideration, it does not make sense to approach immersion as the experience of a "separated ontological space". "Being in", as an ontological experience, is an elucidation of plural coexistence through resonance. In this sense, being immersed as a "being in" is a disalienation from any form of ontological dualism and separation. From this perspective, being immersed is understood as the opposite of being separated. Therefore, in an artistic context, is it worthwhile to intend to create a separate reality? Any departure point will always begin from an end within coexistence. "Being" always relates to simultaneous modes of reality. However, experiential contrasts are what can make us perceive transformations within reality. In this sense, a musical environment needs specific characteristics which contrast with the non-musical time-space. As a result, it is important to establish the differences between the environment of the non-musical time-space and the environment of the musical time-space. The musical time-space creates an undefined experiential territory that can induce the listeners to achieve a state of amazement in relation to their surroundings. In this way, we can enhance our awareness of being-in reality from the experience of being-in a musical environment.

An immersive experience in a sound environment where the sounds are undefined and do not induce the listener to create referential associations can be compared to the involving experience of a womb. A full immersion implies a giving-in to a non-referential and pure state of sensation. Perhaps the ontological importance of belonging is represented in immersive experiences that bring to life the seemingly unreachable memory of the mother's womb. Involving experiences might trigger a sort of unconscious physiological nostalgia. Peter Sloterdijk also proposes the experience of "being-in" as an analogy to the womb:

> Although the physical and psychological life of man presupposes that he has left the womb behind, existence is simultaneously directed to find and occupy, even in a wakeful state, a being-in, and thus a womb-like relationship to his environment (Sloterdijk 2008: 72-73, my translation).

In this quote Sloterdijk describes existence and its relationship to the womb in spatial terms. He describes the disposition and relation of the body with the surroundings. In every spatial layer we are involved in our environment. In this sense, every spatial experience could be understood as a being-in. By thinking of being in the womb, a room, a hall, a city or a forest we may perceive different degrees of distance between our body and what surrounds us (considering that we do not usually perceive air as a substantial involving matter). However, the notion of womb described by Sloterdijk implies that being-in is a sharing of space where the distances are blurred by our body perception. The distance between what surrounds us can only be felt in the proximity of our senses. In this way, a spatial notion is associated with a sensory experience. This can be linked to Nancy's idea of resonance through listening. From a more phenomenological perspective Nancy also identifies being-in through listening as a womb-like experience:

> The womb [*matrice*]-like constitution of resonance, and the resonant constitution of the womb: What is the belly of a pregnant woman, if not the space or antrum where a new instrument comes to resound, a new *organon*, which comes to fold in on itself, then to move, receiving from outside only sounds, which, when the day comes, it will begin to echo through its cry? But, more generally, more womblike, it is always in the belly that we - man or woman - end up listening, or start listening. The ear opens onto the sonorous cave that we then become (Nancy 2007: 37).

Nancy describes the ontological implications of listening and resonance as a condition *sine qua non*. We listen, therefore, we exist in resonance. The womb serves to describe the ontological nature of listening. However, psychologically speaking, we do not necessarily feel ourselves as living in resonance, as being part of a singular-plural reality.

The individual perception of oneself and the contrasting contexts of reality are obstacles to establish a womb-like relation with the environment. Leaving the womb implies an individualization that grows towards adulthood. This develops one's sense of being alone in contrast to what is different from oneself. On the other hand, during the immersive experience, the immersive sensation of being-in implies a sense of belonging. In immersion, the individual perception of the self transforms into a sense of being-with, into an extension or a sublation of the self. The pluralized belonging of an immersive experience seems to aid towards giving sense to our existence as every time we emerge from these experiences we can perceive ourselves, metaphorically speaking, as reborn. Consequently, the following increasing curve towards individualization pulls us again towards the search for another immersive experience. From this perspective, immersion can be perceived as a necessity to give sense to life, and to recover a sense of being-with, which is associated to the involving and aural nature of the womb. Peter Sloterdijk reflects on the aural nature of the womb, and on the ontological implications for the building of a self:

> First: prior to individuation we listen, that is, fetal hearing anticipates the world as a totality of noise and sound that is in a constant state of becoming; ecstatically, it listens to the sounding world from the darkness, usually oriented towards the world, in an unwavering inclination towards the future. Second: after the formation of the "I" we listen back: the ear wants to undo the world as a totality of noise, it yearns to return to the archaic euphony of the pre-mundane interior, it activates the memory of a euphoric *enstasis* which accompanies us as an afterglow of paradise (Sloterdijk 2008: 291, my translation).

The voluntary search for immersive experiences reflects a physiological nostalgia, an unconscious search for the sense of life that can be symbolically represented as a search for the womb experience. For Sloterdijk the experience of hearing in the womb is prior to the experience of the world where we form our individual sense of self. From this perspective, we can perceive listening outside the womb as a prolongation of a non-individual origin. The quote above also refers to an immersive listening in the womb that is expectant of the future, and oriented towards the world. This notion connects to my idea that immersion has to be approached as an experience that observes the world and integrates it in a sensory experience. Listening is always a state of resonance with the world. However, the search for immersion within the continuous and invasive sonic context can lead to dissociation and alienation.

The search for immersive experiences could also be perceived as an aesthetic extension of the immersive conscious modes which occur in our everyday life. In the back cover of Ruth Herbert's *Everyday Music Listening* is written: "Absorption and dissociation, as manifestations of trancing [immersive conscious modes], are self-regulatory processes, often operating at the level of unconscious awareness, that support individuals' perceptions of psychological health" (Herbert 2009, back cover). Herbert proposes that shifts towards conscious modes are biological traits that serve as resting and protective mechanisms. To support her proposal, Herbert describes the research of the psychologist Andrzej Kokoszka who "argues that these rest episodes exhibit natural and cultural 'protective mechanisms' that counteract the detrimental effects of information deprivation or overload" (Herbert

2009: 203). The forms of immersion that Herbert investigates are referring to conscious modes that are not only related to music listening. The resting episodes can occur in diverse situations with or without music. Herbert tries to describe the connection between the biological origin of rest episodes with human cultural (not only referring to the arts) activities, as she further proposes:

> It is therefore possible that hobbies, for example (including music listening), may function at one level as external justifications of periods of mental and physical recuperation, behavioural 'masks' that serve to validate a need for rest and rejuvenation, used in a culture where merely to sit and stare (certainly in public) might be considered at best a waste of time with no measurable end-product, and at worst offensive (Herbert 2009: 203-204).

The quote above suggests a physiological and psychological origin of hobbies and cultural practices. The notion that the existence and establishment of a musical cultural context is a result of biological necessities suggests that music in its cultural context can easily lack a "special" sense, and participates as a conventional necessity within the normality of daily routines. Herbert's implied intention to understand the origin of art might cause the reader to perceive an air of commonness in relation to the special mediating effect of music. Considering the fact that music listening (often) occurs within an everyday context, it is necessary to give a different and special attention to that which might *artistically* transform the perception of everydayness. Herbert's case studies give evidence of the diversity of aesthetical impressions that people experience through music in daily situations. From a composer's perspective, Herbert's research therefore serves, as an invitation to critically observe and evaluate everyday and artistic situations that people might perceive as special.

Sloterdijk describes a similar notion to that of Herbert, but from an anthropological perspective. He describes human existence as consisting of "on and off" cycles:

> Humans are beings who cannot abstain from dropping the curtain of the theater of the world for a few hours every day - even when during the day they define themselves as rational beings, and reason pretends to be able to maintain a long-lasting wakeful relationship with an ever-present world.
>
> A new kind of philosophical anthropology arises from the assertion that men are beings who exist in rhythms of the rise and fall of the world - existent, non-existent, present, absent. From the idea of anthropology as onto-rhythmical arises a dual program: on the positive side a metaphysic of triviality, and on the negative an ontology of discrete or gray nothingness. Within this rhythmological aspect, there emerges a secret affinity between diverse parts of human life which are never normally considered together: sleep and stupidity, the oldest spaces of withdrawal from the world, touch upon the cultures of drugs, of meditation, of speculation, and of music, the gracious art which, as is usually said, transports us from the pale hours to a better world. They follow one another like the components of an immune system for a defense against the infectious and excessively demanding world (Sloterdijk 2008: 289-290, my translation).

The “immunological system” described by Sloterdijk is analog to the “protective mechanisms” mentioned by Herbert. The “on and off” natural cycles, as protective, resting and restoring necessities, are mirrored in our cultural practices. Therefore, music can be perceived as a habit within the “on and off” loop during wakefulness. Music participates in an overloaded social context where “disconnection” is a necessity. In this context, music is commonly used as a mechanism of dissociation. As Sloterdijk says, it is common to describe music as taking us to a better world. This ties music with a movement to another world. In this context, music works functionally and participates in modern life as a necessary rest mechanism. From this perspective, the better world that music offers is integrated as a temporary dissociation within the alienating and conditioning factors of the socio-cultural context. Thus, immersion as a result of music listening does not affect our perception and critical awareness of reality. For this reason, to create an open and plural form of immersion, as mentioned earlier in relation to Herbert’s notions, it is necessary to question and observe critically the automatisms and habits of musical practice. What artistic characteristics can produce is a long-lasting aesthetic effect which affects one’s sense of being and which does not only remain in the commonness of the everyday loop of biological and routine immersions.

Reflecting on the concert setup and experiences of *La línea* brings to surface diverse problems and new perspectives in relation to concert habits. The circular setup *of La línea* seems to create sufficient conditions for a womb-like experience. The invitation towards a different setup, and the voluntary participation in the concert context prepares the listener to achieve an immersive state. The voluntary participation in a different concert setup creates a ritual ground. Just by entering the circle, the listeners experience a “giving oneself in” to an offered composed physical context. The listeners know that they are entering into a composed context. In this act, the listeners commit and simultaneously experience an open attitude towards the offered situation. A ritual requires a commitment. In a ritual, the participants cannot do whatever whenever they want. In this way, *La línea* resembles a meditational ritual. Openly entering into a ritual ground with an experiential expectation is analog to the voluntary aspect of meditation. Entering into a framed circular space is essential for achieving an open perceptual attitude.

The ritual sense is increased due to the existence of recognizable spatial borders. The circular form of the piece can be transported as an instrument from place to place. And, just as any other instrument, it will resonate and behave differently in every given space. However, in this specific case, the audience is part of the instrument. The listeners can perceive themselves as belonging to, and completely involved by, a womb-like resonating entity, and its resonance echoes in the architecture that surrounds it. Belonging to a resonating entity does not mean that the circle is an individual frame separated from reality. Belonging in a resonating entity elucidates the existence of the self within the multiplicity of the world. Jean-Luc Nancy proposes that the notion of unity, which can be associated to the perceived inclusiveness of the circular space in *La línea,* cannot be understood as an isolated “one” but as a unity of diversities which are worlds within the world.

> The unity of a world is not one: it is made of a diversity, and even disparity and opposition. It is in fact, which is to say that it does not add or subtract anything. The unity of a world is nothing other than its diversity, and this, in turn, is a diversity of

> worlds. A world is a multiplicity of worlds; the world is a multiplicity of worlds, and its unity is the mutual sharing and exposition of all its worlds—within this world (Nancy 2000: 185).

From the perspective of this quote, *La línea* exposes itself as a world, and in doing so it also exposes its diversity within, and the diversity that surrounds it. For Nancy, the ontological connotation of his argument is a condition *sine qua non*. However, in the context of Nancy's quote, the argument arises from a philosophical reflection. What interests me is not just acknowledging this inherent ontological condition, but rather exploring how a musical or artistic event can reveal or express this condition through its aesthetic and perceptual characteristics. In this way, *La línea* can describe diverse layers of exposition. The individual characteristics of listening in a given position in space are projected to the whole content of the circle as if it was one big listener in relation to space (many ears create one circular listening space). This creates a multilayered condition of being. The multiple positions (listeners) in the area inside the circle create a diversity within a homogeneity. Then, the circle resonates as a singular entity with a diverse surrounding architecture. Moreover, this setup may allow us to imagine the interaction of spatial layers beyond the architectural and environmental limits. This musical context reveals a sense of being, where "the outside is inside; it is the spacing of the dis-position of the world; it is our disposition and our co-appearance" (Nancy 2000: 13).

2.2.3 Descriptions of *La línea* in diverse spaces

The disposition of the circle in relation to the surrounding architecture conditions the listeners' perceptual and psychological relations with the physical space. Nevertheless, what creates this perceptual diversity is the contrast between the closed homogeneous environment inside the circle with the random forms of the surrounding architecture. This reveals that I was not concerned in using the architectural qualities of a space as reference to develop the composition. The specific characteristics of the possible surrounding architectures (public supplies)[31] were not taken in consideration to develop the spatial ideas. This statement seems to contradict my goal of transforming spatial perception with the surrounding context. However, it does not, because the movements of the conductor and the spatial design point and project sound towards the space outside the circle. I composed the circle as a point of observation towards its interiority as much as its exteriority. The closed and homogenous environment of the circle is what allows the transformation of spatial notions with any surrounding context. The spatialized sounds within the circle were composed aiming at persuading the listener to simultaneously perceive the space within and outside of the circumference, disregarding the characteristics of the surrounding architecture. This makes *La línea* a piece that should be able to relate to any given space.

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[31] The fourth part of Brandon LaBelle's book *Background Noise: Perspectives of Sound Art* is titled *Public Supply: Buildings, Constructions and Locational Listening.* This chapter explores the relation between architecture and the experience of sound in diverse sound art installations. The term "public supply" makes reference to the physical spaces where sound installations or performances can be situated. These spaces range from traditional spaces as concert halls, theatres and museums to any sort of closed space or outdoor spaces as streets and parks. In this sense "public supply" refers to any form of architectural environment.

As in *What about Woof?,* in *La línea,* the hall and the surrounding physical structures affect the sort of transitional experience that the audience goes through. The main difference between the two pieces is that during the compositional process of *La línea,* I acknowledged and accepted that the diverse physical spaces, in which the piece is performed, are going to condition the perception of the piece, while in *What about Woof?* the diverse perceptual effects and variations between setups happen due to spatial limitations. In *What about Woof?* it is necessary to "tame" the hall (as Xenakis would try with his compositions). The variations between performances occur due to a struggle with the physical spaces. On the other hand, the closed setup of *La línea* is created expecting the possibility of any type of surrounding space. *La línea* has been performed in many different settings, and in each context the relation to the surrounding space is conditioned by the position of the circle. As it occurs in every musical performance, the different settings also present diverse forms of interaction between the composed and environmental sounds. However, the main perceptual differences between the performances are caused by the different spatial relations between the circular area and the surrounding physical structures. In the following paragraphs I will describe the different settings in which the piece was performed to contextualize this argument.

The audience going to the stage. On two occasions, the circle was built on stage. In these cases, the traditional area for the audience to sit was visible and empty. The audience occupies the conventional space for the performers. This immediately transforms the context for the listener; the duality and the usual comfortable distance that a traditional setting gives is erased. The audience is aware of the role change of the hall. The hall works as a transitional space because the audience does not sit in their usual location; they have to walk through the hall to another place within that hall. However, the use of the stage in this way is not really unusual; composers have done it many times without thinking of doing anything particularly special, apart from taking the opportunity to create a more *neutral* space than the concert hall itself, in other words a space which could be "coloured" more fully by the music and events taking place there, rather than already being "coloured" by expectations regarding its accustomed use. The main difference of *La línea* with this attitude is that, despite being a relatively common format, the circular setup aims at producing spatial sensations that relate to what is outside of the frame of this piece. Additionally, during the composition process, the circular setup is taken as something special and essential in the functioning of the piece. If significant importance is given to the physical format during the creative process, the music may transform the way we perceive the physical space despite the possible conventional settings. To perform *La línea* with the audience on stage while they are able to see the audience area empty is different than listening to a classical string quartet in a similar setting, basically, because the musical structure of *La línea* is designed in relation to its exteriority. This should sonically emphasise the different spatial sensations and relations that the setting of the piece on stage produces. From this perspective, the empty space has an active role in the perception of the piece.

Performers going to the audience area. On one occasion the piece was performed in the audience area. In this case, the stage area was visible and empty. This does not differ much from the opposite version mentioned above. However, the listeners are more familiar sitting in the area where they would usually sit; there is indeed a clear change of setting in reference to where the sound sources come from. But in this case, the performers and the conductor are the ones adapting to the audience space, and not vice-versa. As a result, in this situation there is still a slight sense of separation as in a traditional concert setting. The audience is in the "official" audience area, and this allows the listener to begin the performance with a more traditional attitude. This attitude might affect the sense of awareness and inclusion of the surrounding physical space that the musical structure intends to produce. In this setting, the listeners are visited by the musicians in their conventional place of comfort, and the new character of this visit might draw the attention of the listener towards what is new in their territory.

Neutral space. On another occasion, it was performed in a big conference hall. As someone enters this hall, the first impression is as if it was a big empty warehouse. The hall is a big rectangular prism with a very high ceiling, about ten meters high. In this case, the symmetry and emptiness of the building creates a drier environment for the piece. The boundaries of the circle are less evident for the audience. This version can be compared to Xenakis' *Polytopes* in which the buildings and the media are built together as an interactive whole. The borders of the circle blend with the building walls as a complete installation. Consequently, the effect of perceiving the hall, as a transformational space is weaker. The hall does not work clearly as a transitional space. In this case, the audience comes out of the piece when they come out of the hall. The performance happens in an area "of its own", which equates the hall to the circle. This self-inclusive characteristic made the performance more common in the sense that it isolates the performance as a virtual entity, separated from the immediate surrounding reality. In this case, I consider the effect of the physical environment as not aiding in achieving my intended experiential goal (to perceive the interaction between the space within the circular setup and the space outside of it). The world created within this physical boundary limits the possibility of producing a multilayered sense of reality, erasing some of the plural readings that the piece can offer. This problem reveals the necessity of a spatial disposition in which *La línea* co-appears with other spaces to create the intended effect.

Outdoors. *La línea* was performed once outdoors. The space was inside an old convent (currently a university), in an open courtyard. As a result, the performance could still be considered as happening inside of a building, or surrounded by united constructions. This is the only performance which included a significant participation by environmental sounds. This made the piece work in a very different way. The soft sounds of the composition blended with the wind, birds, distant cars, people walking, voices, and all sorts of small sounds. This created not only a spatial transformation in relation to the inner sound characteristics of the circle, but a blending of sonorous spaces.[32] The audience enters into a performance space by choice. The sound is constant, and works like a thin surrounding curtain that transforms the sounds outside. The sounds outside are perceived as being close, and they can draw the attention of the listeners as if they were taking a breath during diving. The coexistence between the sound of the piece and the environmental sounds enhances the listeners' attention to both.[33] This might not be necessarily pleasing for the audience. Some might want everything around them to be silent, and others might give in to the blending of internal and external sounds. In any case, the presence of both internal and external sounds cannot be erased. The framed sounds of the circular instrument musically resonate with the sounds of the surrounding environment which is redefined as a dialoguing musical space.

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[32] This blending is represented in the immersive model of entering into water that I will describe in Chapter 3.

2.2.4 Habitus and the contexts of performance

Perception of multiple physical and virtual spaces is not just a discrete experience detached from socio-cultural influences. Physical and virtual spaces can be attributed with multiple meanings. Personal experiences and specific socio-cultural contexts affect the way in which people perceive physical spaces (theaters, churches, hospitals, stadiums, city streets, schools, etc.). Simultaneously, social conventions are at work, exceeding a mere individual perception. Consequently, in order to reflect on immersion from a spatial and multilayered perspective, it is necessary to acknowledge the social context and how conventions influence one's experiences.

In the performances described in the sub-chapter above, the immersive and open qualities arise as a confrontation to an embodied "habitus". "Habitus" is a term that relates to our introjected social behaviors and culturally acquired values. I consider it necessary to delve into this term because it describes a sociological phenomenon and context that may obstruct the perception and understanding of a new approach towards immersion.

The sociologists Loïc Wacquant and Dipane Hlalele describe habitus as follows:

> The way society becomes deposited in persons in the form of lasting dispositions, or trained capacities and structured propensities to think, feel and act in determinant ways, which then guide them (Wacquant 2005: 316).
>
> Habitus is created through a social, rather than an individual process leading to patterns that are enduring and transferable from one context to another, but which also shift in relation to specific contexts over time. Habitus is not fixed or permanent and can be changed in unexpected situations or over a long period of time (Navarro, 2006). Bourdieu (1984) views habitus as neither a result of free will, nor determined by structures, but created by a kind of interplay between the two over time; dispositions that are both shaped by past events and structures, and that shape current practices and structures and also, most importantly, that condition our very perceptions. Habitus is conceived as the mental structures through which an individual apprehends the social world … essentially the product of the internalization of the structures of that world (Hlalele 2012: 269).

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[33] These ideas are closely related to those of John Cage. Later on I will elaborate on them in relation to Cage's thoughts on silence and music.

The historical processes that have led to the diverse musical contexts of today has molded the way we relate to them. Social structuring and conventions condition, to some degree, the way in which people experience and understand immersion and openness. As mentioned in the quote above, habitus does not happen as a consequence of one's free will, but as an interaction between pre-existing social structures and individual choices. Subjects can only begin to interact in an already present social context. As a consequence, it is necessary to acknowledge that an introjected habitus in the context of musical performances is a result of pre-existing, though constantly developing, social processes. From this perspective, open and immersive experiences, which intend to integrate different layers of reality, appear to occur as a confrontation with the more conventional aspects of social reality. In my opinion, habits during musical performances are strongly connected to spatial conventions that occur within what the French Marxist theorist, writer and filmmaker Guy Debord calls a "society of the spectacle".

Debord describes a society that, through mass media, has become a mere representation of a more authentic social life. Although Debord's approach is merely political, some of his arguments may be used to describe aspects of the cultural and social context in which music is performed, and to analyze how social conditioning may affect immersive experiences. For Debord "the spectacle is not a collection of images, but a social relation among people, mediated by images" (Debord 1983: n.p.). He argues that in a "society of the spectacle", perception and authentic social relations are impoverished and that this society is deprived of its critical potential. In this way, a society is manipulated towards a state of passiveness which alienates its population from real experiences. I notice a resemblance between Debord's description of the spectacle and immersion regarded as a dissociative experience into a virtual reality and intended to be separated from the real environment.

> The spectacle presents itself simultaneously as all of society, and as instrument of unification. As a part of society it is specifically the sector which concentrates all gazing and all consciousness. Due to the very fact that this sector is separate, it is the common ground of the deceived gaze and of false consciousness, and the unification it achieves is nothing but an official language of generalized separation (Debord 1983: n.p.).

This quote describes a false sense of unification via simulation, which can be understood as a form of alienation, because the way of unifying and interacting through media is perceived as false. Following Debord, the German media theorist Siegfried Zielinski describes notions of false unification in relation to the socio-economic transformations that occurred during the 20th century:

> The 20th century was a period of disunity, of terrible explosions, murderous political systems, and violent splits, punctuated by phases of economic and cultural prosperity. At the end of the century, we were inundated with concepts of artificial bonding, unifying, and reuniting, as though by way of a conciliatory gesture. Universal machines, globalization, and technological network of geographical regions and identities that are in reality divided were advanced to counter the facto divisions that have intruded between individuals and between people and machines because of

> the unequal distribution of wealth, education, culture, and knowledge. In no way did they serve to diminish real divisions; they merely created the impression that the real gulfs were easy to bridge using market strategies and technology (Zielinski 2006: 40)

According to Zielinski, the alienation created by the spectacle is a result of market strategies and the primacy of technological development. Computers and internet mediate one's relation with the world. Through these technologies one experiences only a simulation of real interaction.

However, for Debord, this simulation cannot be separated from reality:

> The spectacle, grasped in its totality, is both the result and the project of the existing mode of production. It is not a supplement to the real world, an additional decoration. It is the heart of the unrealism of real society. In all its specific forms, as information or propaganda, as advertisement or direct entertainment consumption, is the present model of socially dominant life (Debord 1983: n.p.).

Debord suggests that the social environment is an integral part of one's reality. This notion invites me to reflect about the conditioning nature of communicational and social habits on one's perceptual experiences. How do these habits affect the perception of art? It is difficult to identify how today's artistic practices are critically significant within a "society of the spectacle". How "special" are they? Are they different from mass media? Following Debord, new music practices are embraced within a socio-cultural context from which they cannot be separated. Seemingly revolutionary art forms participate in their own loop of necessary marketing. It is important to acknowledge that every artistic practice will be part of a cultural frame with its own resulting conventions (habitus). This is the main reason why I think that immersion should not be considered as a form of dissociation or as a separate virtual reality.

The co-appearance of physical spaces (the circle and external architecture) and virtual spaces (musical dimensions) in *La línea* works simultaneously as the exposition of a habitual context (simulation), and as a perceptual experience which integrates diverse layers of reality. From this perspective, I propose that the interaction of virtual and physical spaces in a context of habitus (e.g. a traditional concert setting) can be composed to expose conventions *and* to open new perceptual notions. Immersion and openness are rethought as an ability to simultaneously feel *and* critically observe our habitual attitudes. From this perspective, a music composition can be developed aiming at an experience of reality rather than creating a simulated or virtual experience. In order to (re)compose immersion, it is important to consider that the social environment where music is practiced already carries its own virtual characteristics (socio-cultural conventions). Musical immersion can be approached as an event to interconnect sensory experience with a physical reality in order to transcend one's common automatisms. This idea invites me not only to imagine each musical work as a new virtuality, but to try to renew the relations between virtual spaces, physical spaces, and the always conditioning social conventions.

2.3 Compositional processes: immersive reflections

2.3.1 Pitch, timbre and space: blurring the source

As already mentioned in the first chapter (page 37), Frances Dyson proposes that immersion is also obtained by diminishing the critical attention to the apparatuses that produce the sensorial stimuli. The awareness of the source is replaced by a direct sensory experience. When the audience associates a physical sound object to an episodic memory (such as during an instrumental concert) causing an aesthetic value judgment, it becomes more difficult to lose objective awareness. For creating an immersive experience, it seems necessary to blur the referential characteristics of any sound source. This need demands a constant re-approach towards the way that recognizable sound sources are used and presented. Repetition easily creates stylized and recognizable aesthetics.

> Any sound practice ends in a characteristic aesthetic. It is just a matter of time. The audience will build a recognizable aesthetic. The utopia of the non-referential has limits. However, we have to keep on trying that these references are less influential. It is very interesting when those references are not there.[34]

In the case of *La línea,* the blurring of timbral and referential qualities occurred not as a result of an intentional approach to this problem, but as a result of finding practical solutions for musical ideas. In the process of trying to find an effective continuous sound texture through the guitars, the timbral quality of the guitars was transformed. I used a different microtonal scordatura for each guitar and then asked the guitarists to play tremolos. This produced the effect of long sustained sounds and beatings (effects which sound unnatural on a classical guitar).[35] In this way, the referential and traditional characteristics that the guitar suggests were blurred. I considered that an effective continuous movement of sound through space would make it easier to produce spatial illusions based on pitch disposition in physical space. If each sounding position was clearly defined and recognizable, then the relation between the circle and the surrounding space would be more static. I worked and experimented on the problem of continuity in workshops with six guitar players (although the piece was eventually composed for twelve guitars). Below I will describe some of the exercises we tried during these workshops, and by doing this I will also describe how the solutions led to immersive sounds.

1st exercise: the main goal was to pass a constant sound (unison) from guitar to guitar. The passing of the note from one instrument to another should not have pauses or silences in between. Classical guitars cannot sustain sounds for long. The only way to make the illusion of a long sound without the aid of technology or additional devices is to play repeated notes with tremolo technique. Initially, I intended to create a continuous texture using the guitars in a conventional way. For this reason, the repeated note tremolo was the most logical technique to begin with. This exercise was written with traditional score notation with sextuplet tremolos and dynamic swells that created cross-fades.

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[34] Personal interview with Francisco Lopez on October 16, 2012.

[35] "Beating" refers to the audible beats that result from the interference between two close frequencies.

2nd exercise: The spatial motion of this exercise is the same as in the previous one, but now also includes a chromatic rotation, moving in semitones as the sounds move from guitar to guitar. The pitch-change between guitars fragmented the flow of sound, and even when the cross-fade was well produced, the chromatic pitch change produced a scaling effect. The glissando-like gesture that I expected within the tremolo texture did not work with chromatic scales. On the contrary of what I intended, moving from guitar to guitar in semitones too clearly defined the position of each sound source.

3rd exercise: multiple simultaneous circular rotations, performed with tremolos as in the previous exercises. In this exercise, my interest was to achieve a continuous cross-fade of three different rotations. In this exercise, different speeds and directions of rotation happen simultaneously (as seen in figure 4). The resulting dynamic contour of the overlapped lines should create three perceivable rotation speeds. This exercise resembles the rotational design of Xenakis' *Persephassa.* In *Persephassa,* Xenakis uses tremolos and cross-fades between players to create a continuous movement of sound through space. This continuity and spatial cross-fading highlights the physical movement of sound through space. The continuity aids to produce an immersive effect, as the sound-flow is not fragmented into identifiable gestures or figures. In this sense, I am considering that continuous sound, as used in *Persephassa* or in *La línea,* aid in achieving an immersive effect.

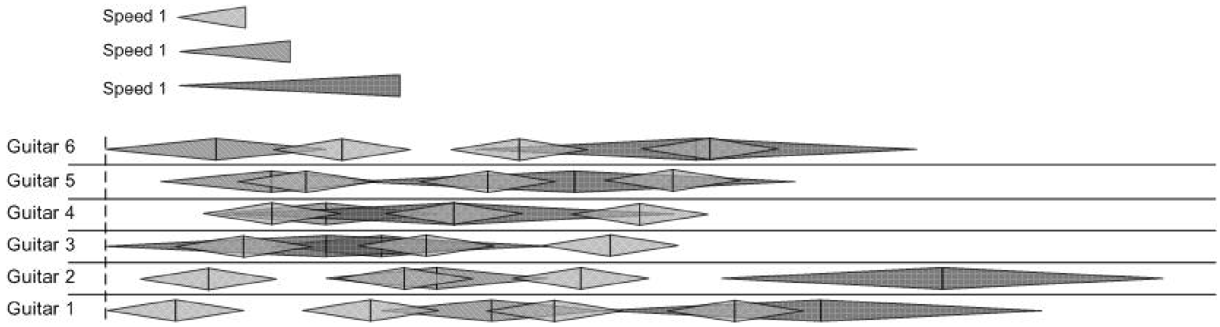

Figure 4 Cross fade exercises with three simultaneous rotations.

The result of this exercise did not work as expected. The tremolo and the demanding detailed dynamic control made the overall result nervous and erratic. As seen in the graphic above, it is difficult to recognize and distinguish the three speeds of rotation during the denser overlapping areas. In this stage of experimentation, I did not recognize that the number of guitars used was limiting a broader perception of movement. Six guitars made the different rotations overlap too often, and made each guitar sound as an isolated point.

Furthermore, the chromatic pitch change created a fragmentation of space. In a more traditional context, chromaticism is considered and perceived as a form of glissando. However, in this case, the physical separation makes the half-tone distance sound as a big intervallic jump.

The first and most logical solution to avoid this fragmentation was to alter the tuning of every second guitar by a quarter-tone deviation. Then, to aid the guitar players in a practical way, I retuned the first three strings so that they can easily play a unison with the three of them (with an easy fingering for the left hand). This retuning also affected the guitar timbre. The first two strings of each guitar were lowered to easily produce a unison with the third string in its common tension. The lowered tension of the first two strings, plus the difficulty of having a precise tuning with this low level of tension, makes the resulting sound from the tremolo sound buzzy, losing the referential quality of the guitar. In this context, each guitar individually sounds like a plucked string instrument, but not much like a classical guitar. The continuity created by the change of timbre, plus the microtonal distance, blurred the specific physical position of the sound sources. When all of the guitars are sounding simultaneously, the timbre becomes even more undefined, and the physical objectivity and referential quality of the sources become even more blurred. The guitar loses its traditional role, and the referential associations disappear during the sonic experience. In this way, the listener’s attention to any specific physical position is decreased.

This phenomenon also creates a perceptual transition from the common cultural expectations that a guitar implies, towards an experience of sound without the source as protagonist. This notion can be related to the characteristics of acousmatic music in which any sound may be used as musical material and where there is no visual relation with the originating cause. In the 1950s, which is the historical period when *musique concrète* and acousmatic music began to develop, such compositions might have had an immersive effect in which the unconventional sounds transform the perception of the conventional concert context. The timbral novelty of the musical material used might have opened a multilayered immersive space due to the clash with the conventions of the time. However, as quoted earlier, “any sound practice ends in a characteristic aesthetic” (Lopez 2012). In the case of *La línea*, the use of the guitar refers to the instrumental tradition of an instrument that we often listen to in our everyday life. Probably people listen to guitars mostly through speakers as an acousmatic sound. In any case listeners are able to associate the heard with the instrument, extracting the instrumental sound from its acousmatic appearance. Despite the diverse musical styles in which guitars are used, and the diverse techniques that these imply, we can consider that, generally, we hear guitars played in a conventional manner. Accordingly, the expectations of the listeners relate to what the instrument culturally represents. In the case of *La línea*, time is needed to deform these cultural expectations that the known instrument offers. The embedded traditional attitude towards the forthcoming artistic event is key to persuading the listeners to achieve an immersive state. The traditional expectations are deceived, and the listeners are slowly persuaded into a more open and experiential mode. The presence of this sort of transitional time also reveals a clear difference with “simulated” realities, where sounds are immediately non-referential or immediately associated to a virtual object. The convention of the concert, due to its “normality”, can be associated to an everyday context. A certain form of musical immersivity is expected, and the listeners expect that an aesthetic event will happen. In the case of *La línea*, the process of mediation occurs as a sublevel that transitions after the music begins and occurs within it. Sound starts as expected, however the “new” way that sounds are presented transforms the expectations gradually into a different experiential space. Therefore, the transformation that occurs within the duration of the musical event can be compared to the perceptual transformations that occur in everyday situations where music is present. In an everyday context, such as during shopping when music suddenly begins (or continues), the mediation occurs randomly, in an unexpected way, and with no need to pay attention to. Music is part of the ordinary everyday life. Music appears as a presence that blends with the spatial environment, transforming our perception without us necessarily noticing it. Analogically, in a conventional musical event, the music begins as expected and the listeners sit in the musical space which can be compared to entering a shop. In this context, the musical beginning is also part of the conventional setting (as part of a "shopping" experience). The experience of entering a shop can be thought of as conventional as a common musical beginning. Possible transformations towards immersive conscious modes and new forms of awareness may happen after the music started, as transitions within music (as well as within shopping situations with music). The audience, when listening with a conventional attitude, might experience these transitions in an imperceptible way. In this way, the characteristics of these immersive transitions within music could be compared to the mediating and transitional characteristics of music in everyday contexts.

However, in a music performance, the conventional expectation is a form of predisposed state of openness that is not natural to everyday contexts. For this reason, in *La línea* the referential associations that arise from the guitar's presence on stage serve to deceive the expected. The presence of loudspeakers immediately offers the possibility of a virtual space, whether the sounds are synthesized or concrete. This possibility is not offered by a classical guitar played without amplification. The sounds that appear from a loudspeaker offer an immediate virtual space. Furthermore, from a loudspeaker we can expect almost every sort of sound. There is no point in expecting a particular sound from a loudspeaker. From a classical guitar, visually present and acoustically performed, the members of an audience can expect sounds that are limited to its physical possibilities (including extended techniques). As a consequence, in *La línea*, to achieve a non-referential listening, a longer transition is necessary. This slow process helps to perceive immersion as an integration of diverse perceptual layers and not only as an immediate virtual space created by sound.

In *La línea* there is a confrontation with the traditional limitations of the instrument. The new timbre in *La línea* does not occur from a radically different usage. The guitars are not played with objects, or as a drum, or as bowed instruments. Sounds do not appear immediately as non-referential. The compositional exercises previously described reveal how the new timbre results from trying to create a constant sound with an instrument that does not resonate for long. The traditional nature of the instrument was challenged by the need for a specific sound gesture. The tremolo and the new scordaturas appear as a result of this necessity. None of these uses are totally new for the guitar. However, the resulting sound texture when all twelve guitars play simultaneously offers a very uncommon timbre and continuity for guitars. As the listeners experience the piece, the physical objectivity of the guitars slowly blends with a sonic outcome that gradually becomes a sonic virtuality. The slowness of the transformational process allows all the pre-existing layers (physical spaces, expectations, social context) to keep an active role throughout the transformations within the piece, resulting in the experience of a multilayered reality.

After retuning the instrument and finding a timbre that fits the needs of the composition, the continuous movement through space could be solved in an easier way. The rhythmic continuity and flow was solved by an improvised exercise during one of the workshops. I stood in the center of the six guitar players which were placed forming a circle, and pointed with one arm towards one guitarist and started rotating. All of the guitar players had to play all the time the tremolo at an almost imperceptible volume. Additionally, they had to play louder when my arm was pointing towards them. As a result, they could focus more on listening to the passing sound from guitar to guitar. I instructed the players to attempt to create a larger cross-fade, so as to not leave a silence or softer gap in between them. To solve this, I told them to look to the pointing position as the center of an area, the center being its loudest point and the imaginary external borders as the softest. (Figure 5).

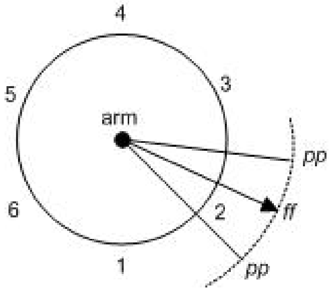

Figure 5 The pointing arm guides dynamic fluctuations

Consequently, the flow effect I expected was immediately achieved. The players were fully focused on the moving arm and on listening. We immediately started trying different forms of reading my arm's movements. Some of the variations that I finally used in the piece were:

- playing with two arms moving simultaneously in different directions
- speeding up and slowing down rotations,
- using the height of the arm as a volume controller
- changing the speed of the tremolo as I walked closer to or away from the players.

After defining and practicing a series of instructions on how to read the movements of the conductor, the intended flow of sound between players was achieved. While conducting and improvising inside the circle I felt that every movement I made seemed to have a sound and spatial effect. As I moved my arms, I felt that I was moving a substance that reacted very naturally to my gestures. Through this experience, I discovered myself in an environment that I did not expect in the beginning of this project. The whole setup was working as one interactive instrument. At the same time, it was easier for me to visualize myself as a listener. We always listen when we play an instrument. If I play a guitar or a piano, I also listen to it. However, in this case, my distance from the sound source with its sometimes unexpected sound quality made it easier for me to perceive myself in a dual state of performer and listener. The sounds made me aware of my physicality. I perceived myself as being moved by the sounds, and simultaneously being responsible, through my movements, for the sounds produced. This perceptual effect interested me because I imagined that my experience as a listener would also be experienced similarly by the audience. I was able to, through listening, empirically experiment with the spatial illusions that I initially intended to produce. These experiments led me to situate the audience facing the conductor.

My intention in setting the audience facing the conductor was so that the audience would perceive the connection of physical movement with sound, without focusing on the sound sources. The imaginary lines that connect the conductor with the sounds pass through the bodies of the listeners. When the arm of the conductor is pointing towards the guitar players, it also points towards the audience. As the arm points towards the listeners, they perceive the sound coming from behind as an intensification of their presence, and as an embodiment of the visual gesture. In this way, the visual effect produces a sound sensation that directly affects the listener. Every visual instruction is connected to what is heard. I imagine that at a certain point during the piece, some listeners within the audience might give in to this way of listening, and actually feel themselves as producing the sound when the conductor points in their direction (listeners that perceive themselves as resonating). In this sense, the visual aspect of the conductor enhances the sonic experience (not of listening to the material or its development but of listening to oneself in a resonating organicity).

I decided to work on the piece from this new perspective, but as a result, I was obliged to sacrifice the figurative complexity that I could achieve with traditional notation. The simultaneous speeds of rotations and detailed rhythmical ideas were abandoned, as the focus of the players could not be on their scores but had to be on the conductor's movements.[36] This forced me to work with very simple material of a very clear gestural nature. As the movement of sound had to be connected to the movement of a human body, the type of sound gestures were always limited by the body's limitations. These limitations influenced the way I approached the development of rotations and the relation of the piece with space. The positive aspect of these limitations is that every musical possibility had to pass through an embodying process, and as mentioned in the previous paragraph, the body movements were always connected to a sonic outcome. This process reveals how the composition and the musical outcome are a result of a physical immersion, where the perception of physical space, body and sound are always interdependent. This reveals that *La línea* is a composition that results not from immersive ideals which are objectively affecting the approach towards the compositional processes, but from a process which is immersive. The embodied sensation (immersive) inside the circle was a discovery that occurred as a result of the exercises described earlier which originally aimed to produce simple spatial movement of sound. Once I defined the circular setup and behavior of the material, every process had to depart from an initial physical experience (conducting limitations). I had to first immerse in a physical behavior that later led to new processes. The virtual qualities of the piece arise from this immersive origin.

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[36] This is different from the shared attention that performers give to the conductor and to the score in a conventional setting. As I will explain further on in *La línea* the conductor movements communicate musical information that is missing in the performers' parts. The resulting choreography works like a score in motion.

This immersive process led to the creation of a score with open characteristics. As mentioned earlier, the conductor's movements affect the way sounds are produced. This forces the players to always look at the conductor's movements. As the conductor has to turn and move around, he or she cannot have a score in a fixed position and follow it (the conductor has no choice but to memorize the score). This interdependency demanded me to invent a different kind of score. The first spatialized musical sounds that I composed were adjusted to the physical possibilities of the conductor. I invented a way to write these movements in a score that is a set of choreographic instructions (Figure 6) plus some written cues to trigger pitch changes.

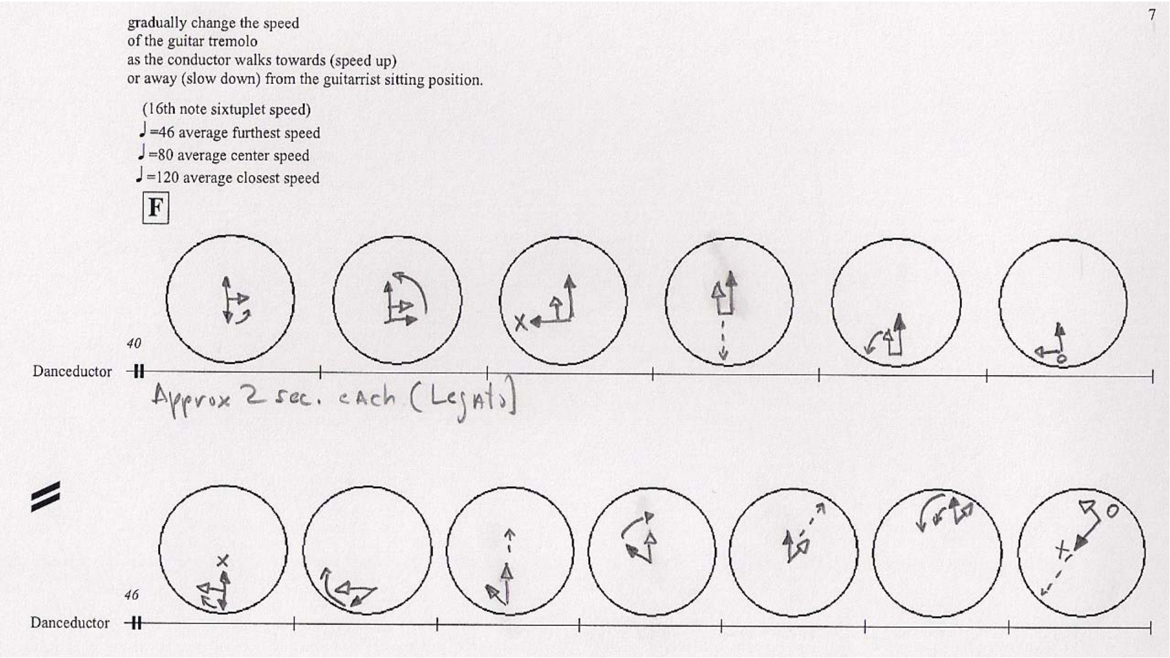
7
gradually change the speed
of the guitar tremolo
as the conductor walks towards (speed up)
or away (slow down) from the guitarrist sitting position.
(16th note sixtuplet speed)
♩=46 average furthest speed
♩=80 average center speed
♩=120 average closest speed
F
40
Danceductor
Approx 2 sec. each (Legato)
46
Danceductor

Figure 6 Choreographic instructions for conductor.

When I was writing the movements, I had a spatial map of the pitches and a structural timeline to know when and where the pitch changes would occur. However, when I finished the score, only the circles with the inner indications remained, as seen in Figure 6 above. Therefore, the conductor cannot be completely aware of the specific pitch map around him. This did not result from an intentional choice. This type of score resulted as a practical need to communicate a choreography that needs to be easily memorized. The specificity and simplicity of the circular instructions describe a clearly fixed structure that results in a performance that is structurally not mobile. The focus demanded by the choreography does not allow the conductor to make a representation of the sonic outcome. The conductor's part works as an incomplete source. This incompleteness persuades the conductor to have an open attitude towards the score. The feeling of openness does not reside on the structural and interpretative mobility of the score, but on the fact that the conductor is an indispensable part in completing a whole that cannot come to life without his interaction with the other parts. In *La línea* each part is incomplete in itself and can only be completed through the interaction between the performers and the conductor. This phenomenon relates to scores that do not offer the possibility of making a sonic representation through reading. I consider this an open characteristic of the score, which I call "invisibility".

The sonic "invisibility" of the score induces the conductor to be expectant of the sonic result as if he was going to listen to the piece for the first time. The conductor as listener aims at perceiving something more. Merleau-Ponty reflects on this notion: "It is thus of the essence of the thing and of the world to present themselves as 'open', to send us beyond their determinate manifestations, to promise us always 'something else to see' " (Merleau-Ponty 2002: 388). In the context of this quote, openness is approached as a necessity against the limitations of the objectivity of perceiving a thing as "one". For Merleau-Ponty, the objectivity that arises from visual logic restrains the full perception of objects and of the world.[37] For him it is necessary to recover a sense of mystery which leads to a perceptual subjectivity. These notions connect to how *La línea* is perceived as open. The determinacy of signs and symbols in the score does not clearly connect to the sound representations. The score creates a gap between representation and experience. The fixed aspects of the score clearly present a part of the experience (choreography) but they hide, almost completely, the sonic outcome. Because of this characteristic, in the moment of the performance, the conductor can perceive himself as a listener despite knowing how this interactivity operates.

The guitar parts work in a similar way. Each guitar part has the conductor's line (with its circular designs) on top of their own. Most of the time, the players hold particular pitches for extended durations in order to be able to look at and focus on the rhythmical and dynamic indications created by the conductor's movements. The guitar staff indicates few points to change pitches. This results in an almost empty score. The conductor's movements work as a score in motion, complementing the guitar parts. Accordingly, the performers depend on the conductor to complete the overall sonic result. The performers, in the same manner as the conductor, become listeners. They depend on the group interactivity to be able to listen to the full sound result. This interdependency causes the players to focus on how their communicative behavior affects the overall interactivity.

Although the previous argument shows an open attribute in the score of *La línea,* the fixedness of the score and its non-suggestive instructions contradict other perspectives of an open work. For Umberto Eco, the participation of the performers has to add an individual characteristic to the work:

> …the individual addressee is bound to supply his own existential credentials, the sense conditioning which is peculiarly his own, a defined culture, a set of tastes,

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[37] This idea can be associated with the notion of "false objectivity" as discussed in Chapter 1.

> personal inclinations, and prejudices. Thus, his comprehension of the original artifact is always modified by his particular and individual perspective (Eco 1989: 3)

When addressed to the listeners, the argument above seems to be inevitable. But if addressed to the performers of *La línea* those personal characteristics are somehow void and seemingly unimportant in their performative and compositional role. This can be interpreted as if the players were used as parts of an organic system. This system enables the players to experience all of the characteristics presented previously in Eco's argument as listeners but not as performers. Prior to the performance, the memory of the piece is of no importance, and their performative focus is replaced by their particular and unique listening expectations. The resulting sounds that the performers listen to come from a communicational task, more than from a personal interpretation of the specific sounds within the score.

The "open" characteristics of *La línea,* previously described, derive from the necessity for finding practical solutions to notate the functioning of a previously designed interactive space. The open characteristics are a result of the immersive characteristic of my initial experiences as a conductor during the creation of the piece. This also suggests that the development from an immersive goal or experience towards a score of open characteristics is sometimes a practical tendency. In the following chapters of this dissertation, I will present other cases to sustain this argument. Music that intends to produce immersive effects tends to demand for an open approach. As mentioned earlier in the case of *La línea*, I did not intend to produce an immersive experience. In *La línea,* immersion is the experiential result from the performance of spatial ideas. Musical spatialization implies the creation of an immersive space. For this reason, I perceive the solutions that led to the immersive conducting modality of *La línea* as a result of the natural interdependency between space and immersion. Spatialization and immersion interconnect to develop into a score of open characteristics.

2.3.2 Rotational Perspectives

When the conductor is in the center of the circle and acts as a movement controller, the kind of spatial relations between him, the audience, the sound sources, and the space outside the circle can produce many diverse relationships. The notions and processes that will be described below arise from my experience conducting the guitar players during the initial workshops. Some of these notions will seem to contradict with the described conducting limitations mentioned earlier. So it is important to clarify that these ideas are extensions and "imaginations" that occurred within the listening/conducting experience. Later on, during the compositional process, I adapted these ideas to the physical limitations of the conductor. As a consequence, the composing became an overlapping and cyclical process, starting from a physical experience, moving towards a virtuality, and returning to a physicality, all mingling back and forth. This resulting compositional method describes an immersive process in which physicality (spatial and human) and virtuality (musical timespace) intermingle. Through the following presentation of the resulting compositional processes I intend to demonstrate the existing interactions between the virtual and physical spaces that are present in *La línea*. These processes also reveal the compositional origin from where I developed the arguments presented on the subchapter 2.2.

The circular setup of the piece aims at producing rotational sound gestures. I approached these rotations from three perspectives (Figure 7). In the following paragraphs I will explain each perspective.

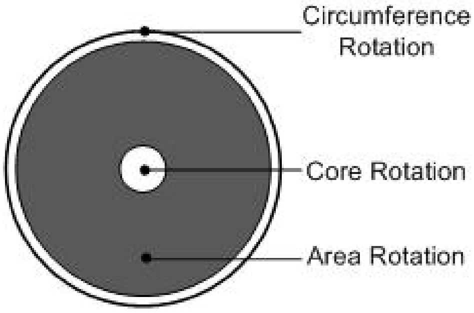

Figure 7 The three rotational perspectives.

Through the piece, I shift from one perspective to another. These perspectives appear in sequence, overlap, blend, and separate in different ways. The goal was to create a perceptual illusion where the virtual and real spaces blend to cause a feeling of spatial disorientation. The virtual implications of this occur through the changes inside of the circumference. The real perceptual changes occur as a consequence of the relation between the resulting virtuality within the circle with the physical space outside of it.

To understand how the three rotational perspectives are perceived, we have to imagine ourselves sitting in the "area of rotation" looking at the core (Lx in Figure 8). When there is only a "circumference rotation" (as seen in Figure 8) we can perceive ourselves in a specific position that is being surrounded. There is no correspondence between the facing direction of the conductor and the rotating sound. Only the pitch rotates to a new position.

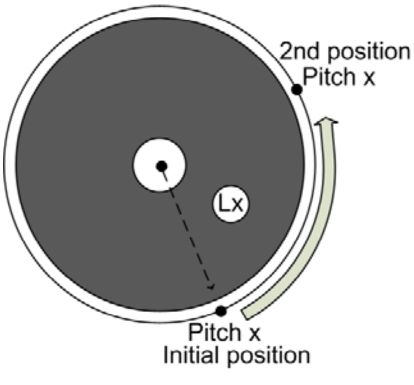

Figure 8 Circumference rotation

When there is a "core rotation" (as seen in Figure 9), only the conductor rotates.

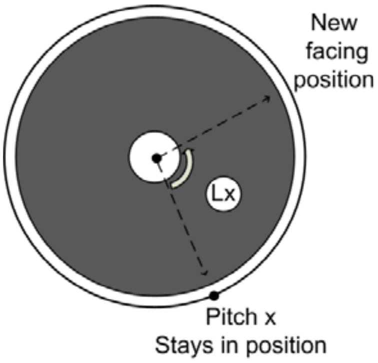
New
facing
position
Lx
Pitch x
Stays in position

Figure 9 Core rotation (conductor rotates)

The "area rotation" (Figure 10) happens when a core rotation (visual) corresponds with the circumference rotation (pitch). During an area rotation, the listeners change their position in relation to the other two corresponding points.

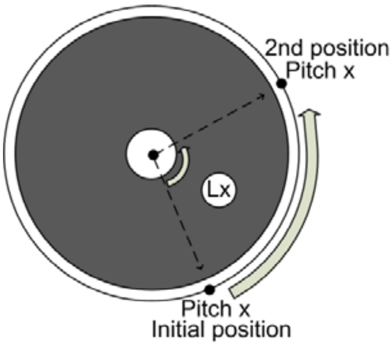
2nd position
Pitch x
Lx
Pitch x
Initial position

Figure 10 Area rotation

Focusing on producing a rotational effect in each perspective leads to the creation of different musical material and perceptual situations. The overlap and diverse combinations between the three forms of rotation create diverse relations and inconsistencies between physical rotation and virtual dimensions.

The rotational perspectives are connected to a more general perceptual interaction: the internal vs. the external movement (Figure 11).

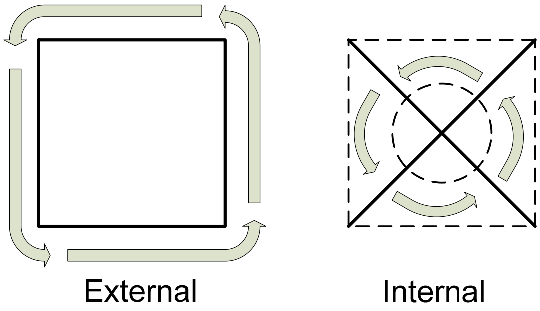

Figure 11 External and internal rotational perspectives.

For instance, a single musical idea can be approached in different ways as seen in Figure 11. I consider the angles and lines as the virtual position of sounds, and not as the physical positions of the sources. This means that the sources will have to adapt to the previously proposed sound movements. The first square on the left shows four sounding points (vertices). The square approach results from an external and surrounding perspective. If we visualize the rotation of only the 4 vertices, we only perceive the linear movement of a square circumference. However, if we visualize the rotation of the inner lines of the square, we can see the area that they will cover (as seen in Figure 12 below, in the second circle from the left). This new perspective produces a shift of focus towards the inner changes. As a result, it is possible to identify the diverse possibilities and relations between an external and an internal approach. In the third circle from the left (as seen in Figure 12), the same vertices of the first circle are presented as a cross. The rotation of the cross covers the full inner area. The cross rotation makes one perceive the sound as a current that pushes the inner areas. In *La línea*, the differences between both approaches (external and internal) are reflected in the way pitch, rhythm, dynamics, and visual elements are used. Related to this, the visual relation between the audience and the conductor conditions some of these effects. For instance, if there is a harmonic rotation and the conductor does not move, the audience perceives a surrounding external movement. However, if the same harmonic rotation happens with the conductor rotating in synchrony with it, the audience perceives an internal rotation. In the latter example, the conductor can be understood as the center of the cross.

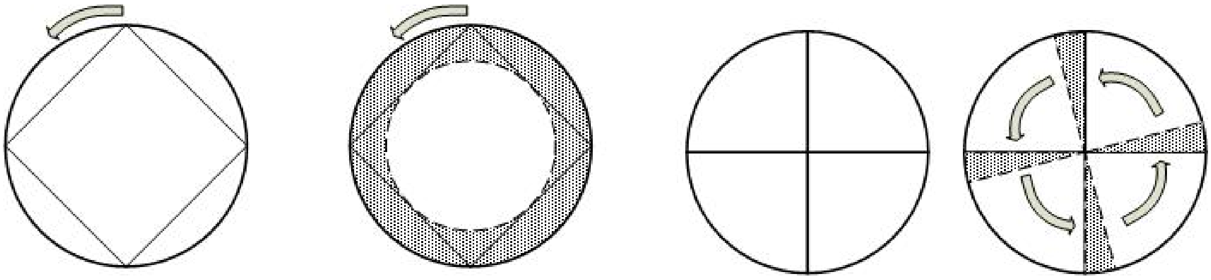

Figure 12 Square and cross internal perspectives

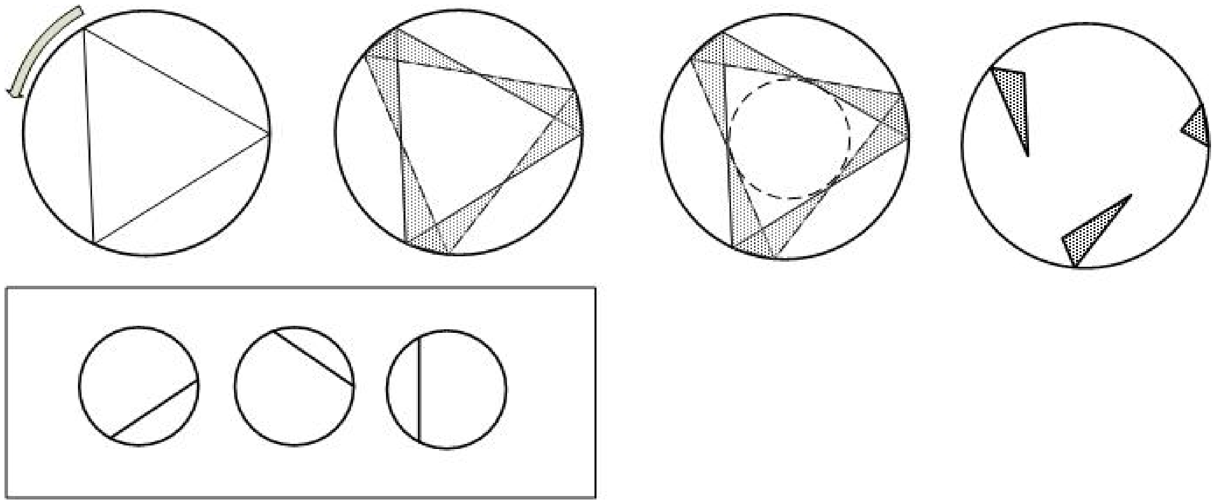

Figure 13 Triangular internal perspectives

In Figure 13, we can see the same process as in Figure 12, but with a triangular design. The framed rectangle in Figure 13 that shows the single lines inside the circle aims at isolating the inner spatial events that can be approached separately in the compositional process. The last circle on the right shows areas resulting from the rotation of the triangle. I approached these areas as mobile figures which have a characteristic timbral and harmonic color. For instance, if I move and rotate one of the resulting polygons to another position within the circle, I would project the original sounds that created the polygon, from the polygon towards the circumference, creating a different surrounding spatialization of the sounds corresponding to the polygon. In this way, a small fragment within the circle can project different spatial forms towards the outside. (Figure 14)

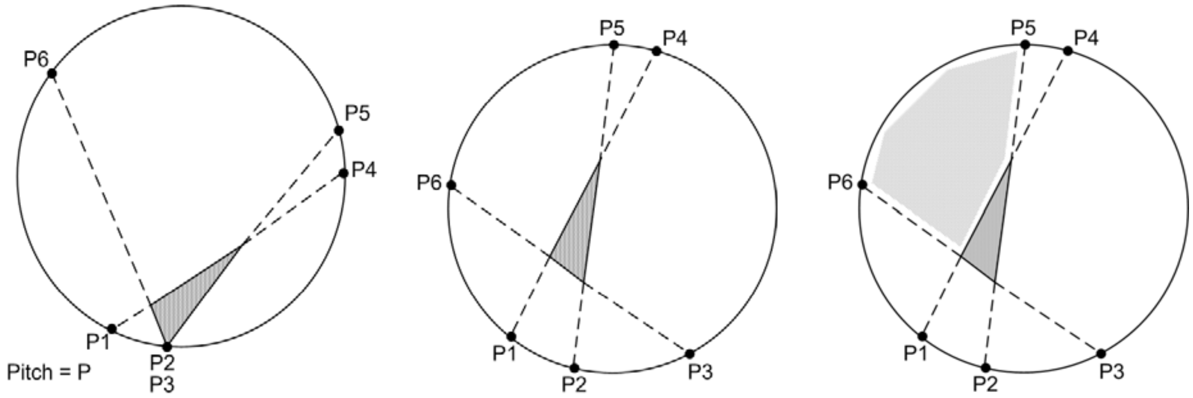

Figure 14 Pitch projection from inner polygon.

The circle on the left (seen above in Figure 14) shows how each segment of the polygon is prolonged to connect with a sounding point (pitch) on the circumference. The circle in the center shows a displacement of the polygon and how the same pitch material is projected into a different spatialization. The circle on the right shows a shadowed area that represents a new area resulting from the projecting lines. The shadowed area is defined by the sonic characteristics assigned to the guitars that are between P5 and P6. This process reflects how a common external approach (circumference rotation), when approached internally (as a cross rotation), can create new spatial projections from the inside. This reveals that the sonic material perceived by the listeners inside the circle is a result of a process that looks outwards (from inside the circle towards the outside). This does not guarantee that the listeners will recognize this approach. This process creates new spatial relations that would not occur in a common inward looking approach (focusing on what occurs inside the circle). In *La línea* the spatial outcomes that come from an outward looking process (focusing on the space outside the circle) may allow the listeners to simultaneously feel surrounded by sound and to perceive the external physical space beyond the sonic boundaries created by the circular setup. This experiential description can be perceived as a phenomenological idealization. However, I devised this description in relation to my listener's experience of *La línea*. Therefore, I consider this perceptual description as a real experiential possibility.

Following the logic of an outward approach, I also project lines from the resulting intersections of different rotations (Figure 15). The intersections project sounds towards different points of the circumference. This can produce an irregular sound effect of random positions. These positions still follow the proportional space of a simple rotation.

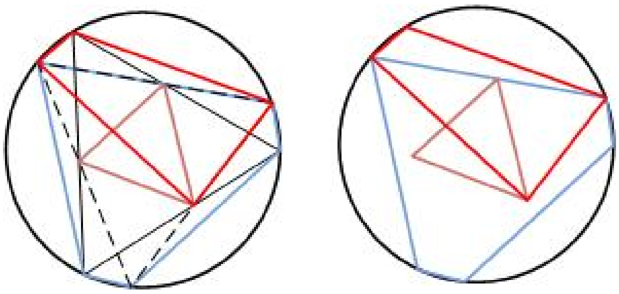

Figure 15 Projection of intersections of overlapping triangles.

Keeping the internal and external movements as a reference produces a focus on the movement of sound disregarding the position of the sound source. In this way, the musical gestures and the sorts of sounds chosen for each player come from observing a movement within a limited spatial area of the audience. For instance, a spatial sound gesture that occurs within a polygon inside the circle could demand the use of a player that seems totally disconnected from the position of the polygon. An initial imaginary movement of sound is what is used to compose the spatial design, and not the position of the source. I am differentiating spatial processes that begin their approach from the position of the source with the ones that focus on movement of sound disregarding the possible sources. The perceptual goals between one approach and another might be similar and end in similar results, but I consider that focusing on movement prior to the placement of the source is more clearly an immersive approach. To imagine the spatial movement of an undefined sound is to imagine a perceptual transformation of the medium that we are in. As a consequence, the gesture I initially imagined will have to encounter physical reality, resulting in a musical gesture that is neither a representation of the initial imagination, nor an imposition of the possibilities of the sound source.

We perceive currents as transformations of our medium, but not as separated gestures coming from a source. When we dive in the sea, we perceive ourselves as moved by the environment. We can recognize the presence of a current, but experientially we cannot separate it from its environment. From this perspective, focusing on the source as the departure point to create an immersive experience seems to be a contradiction. The sources have to adapt to the proposed behaviors of the imagined environment. This adaptation implies that the sources are also affected by the nature of the proposed environment. In *La línea,* the sound sources react and are moved by the imaginary currents of space. Thus, the behavior of the source and the gestural environment cannot be separated.

2.3.3 Pitch as an imaginary space

Pitch is used to develop a virtual space that interacts with physical space. Specific pitches are initially connected to specific positions in the physical space, and then these positions start to change (gradually rotate or jump). The physical association with pitch starts to interact with virtual uses of pitch and harmony. Initially, I imagined intervallic distance as a virtual physical distance. It is important to understand that the virtual space in which I describe these ideas has physical conditions that are imaginary and do not correspond with real perception. These virtual compositional ideas are transformed in their real sonification. For this reason, the following description does not correspond with perception based on psychoacoustics.

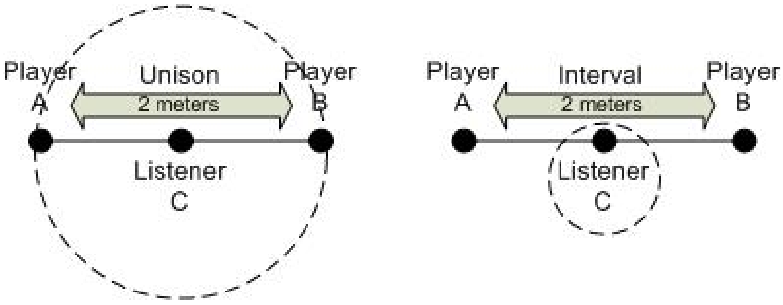

Figure 16 Pitch representation of virtual space

If a listener (C) is located between two players (A, B) sitting two meters apart he or she can easily perceive their physical distance from the sound sources. I propose that if the two players play a unison the listener is contained in the pitch area perceiving no distance from player to player (left circle in Figure 16). The listener uses the same space as the players, as if they all were contained in a single spot. If the intervallic distance between players increases, the virtual pitch distance between players will also grow, so that the listener will perceive his own position separated in relation to the players (right circle in Figure 16.) The listener feels himself situated between two sounds.

With this logic, I approach the circle in the following way:

The range of the circle is defined by the diameter length between the first and seventh guitar (Figure 17). The increasing of intervallic distance and pitch rotations will always have this axis as a reference, making it work as a "fundamental" spatial disposition (as a spatial tonic). This means that when there is a unison between g1 and g7 the audience shares the same pitch distance, as if everyone was placed in a single spot. I imagine the surrounding unison as a sort of shared spatial unity.

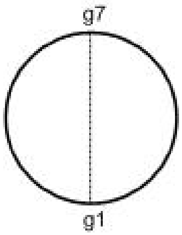

Figure 17 Bottom and top guitar of the circular setup

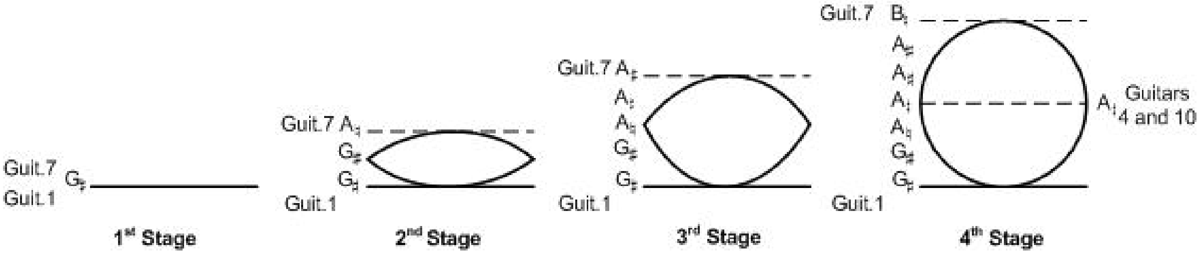

Figure 18: Spatial pitch progression in first section.

The first intervallic distance between these two guitars is a unison (G#) as seen in the first stage in Figure 18 above. This means that all guitars of the circle play in unison. Therefore, as described previously, the listeners are all contained in a single spot (visualized as a line, seen on the left of Figure 18 above). In the first stage of the piece, all of the players play a unison tremolo at an almost imperceptible volume. This makes the G# sound like a buzzing vibration present through all of the space. However, once the conductor starts rotating, a circling motion of G# starts to be perceived around the audience (through dynamic variations of the players). The rotation of the conductor and the dynamic rotation through the circumference correspond to each other. This correlation corresponds to the "area rotation" described earlier in figure 10. However, on a unison rotation there is no pitch change so there is an inconsistency in relation to the "area rotation" described above, where there is a movement in space of a pitch in reference to other pitches. For this reason, the unison rotation, when corresponding to the conductor rotation (core), is not perceived as an area rotation but as a core rotation that reveals the sonic space. Considering that I observe the unison as a unified virtual space, I perceive this unison rotation also as a rotation that occurs within the listener's body, as an embodied and internal sonic rotation.

This description of the unison rotation will be interfered later by short and slow quarter tone glissandos. Iannis Xenakis says that "The glissando is a straight line slanted in space … it is time and pitch rolled into one" (cited in Labelle 2010: 185). For Xenakis the glissando "represents the most usual behavior of a sound, while a sustained note is something special because the slope of the pitch versus time change is nil" (Varga 1996: 69). He visualizes the constant pitch shift of a glissando as a physical gesture that designs a form in a virtual space that is projected as sound in the actual physical one. In Xenakis' music, pitch motion is thought of as spatial motion (as one of the musical dimensions described by Erik Christensen). This notion of pitch shift related to movement in a virtual space is what allows me to imagine an actual physical rotation of a unison as a static situation in a virtual sense. Simultaneously, when there is a unison rotation, it is easier to associate the spatial movement to a physical reality. The forthcoming microtonal pitch changes slowly and virtually interferes in the perception of the physical objectivity produced by a rotating unison. In this way, the designed virtual pitch architecture overlaps, blends, and contradicts with the physical spatial changes. In this compositional process, physical motion through space can be associated with a motionless virtuality, and vice versa, a virtual motion can be associated with a fixed physical point.

The circling unison of the first stage stays for more than a minute before the pitches start to change into the next opening stages. All of the pitch transformations are very slow and they all come out from continuous quarter-tone glissandos in space. I perceive these slow and short glissandos as deformations (an opening circle in the case of the first section as seen in the stages 2, 3 and 4 in Figure 18) of the given unison space. The perception of this should be like being part of an energized environment that starts to slowly move and transform. In *La línea* the tremolo activity never stops. This makes it difficult to perceive when the pitch changes begin exactly and where they lead to. This is done intentionally so that the listener discovers himself in new situations in this constant tremolo texture without leaving the continuous flow of the given environment. Nevertheless, some fixed behaviors, such as the rotating unison of the first stage, stay for a long period of time (in proportion to the piece's length) to define and set conditions of space that must be clearly perceived.

The first guitar will stay as a fixed fundamental in the following stages. As the circling sound movements pass repeatedly by the seventh guitar, its pitch starts to gradually rise in semitones. The remaining guitars complete the interval (fill the space) between guitars 1-7 with quarter-tones, producing the already mentioned glissando effect. This process stops when the intervallic distance between guitar one and seven grows to a minor third (Figure 18, 4th stage.). This interval is a result of the quarter tone distance between each guitar from bottom to top. The resulting pitch disposition is used as a recurrent point of arrival throughout the piece (Figure 19).

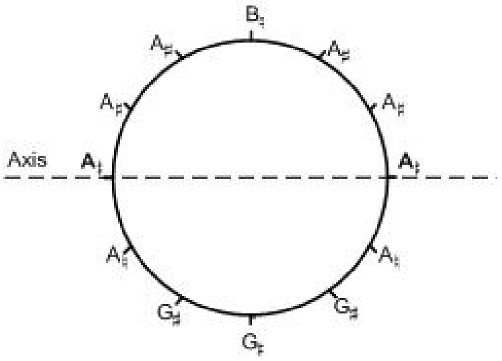

Figure 19 First open pitch disposition

When the intervallic distance reached a minor third, more pitches were required to fill the glissando movement, thus it gradually starts to become possible to connect pitch with spatial positioning. In this sonic context, the sound movement is still perceived as surrounding glissando gestures. This makes it very hard to identify and assign a pitch to any specific position. The pitch positions work more as illusions of position than actual identifiable spots in space. The sounds tend to repeat in a certain position, but they do this always coming from within a circling glissando gesture. Once the first open pitch positioning is defined (as seen in Figure 19 above), the circumference starts to rotate, and based on my experiences as a conductor of the piece, it does not give time for the listener to actually discover or define the spatial pitch structure (Figure 20).

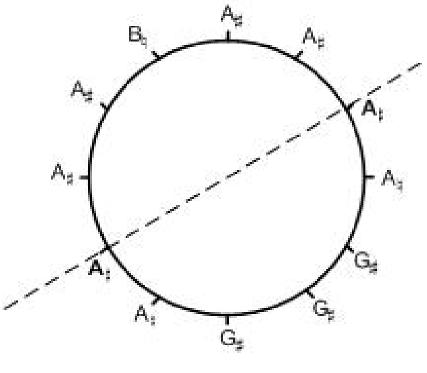

Figure 20 Rotation of the first open pitch disposition

This behavior causes pitch to be perceived as a constant flow. In the first sections of the piece, the harmonic and modal relations are almost erased in the microtonal movements. The more traditional motivic, harmonic, or tonal uses are replaced by the use of pitch to draw a spatial design and to create a continuous sensation. However, the previously described processes still reveal the presence of a spatial narrative as an equivalent to a harmonic narrative that could be associated to a musical tradition. The imaginary gravitational forces push and accelerate the pitch rotations to specific dispositions that repeat throughout the piece. Nevertheless, as mentioned before, the exact position of each pitch will be hard to define within the continuous sound movement. In spite of the existence of spatial pitch cycles, the constant sound flow in space within a small microtonal range seems to make pitch not important in its more traditional musical sense. The spatial and pitch narrative blend in a process of movement that creates an environment that transforms in a musical way without revealing its formal relations. There is an intended musical transformation that creates a sense of "directionality". However, this "directionality" is not revealed in the surface, as there are no clear musical figures or a marked musical structure. As a consequence, the listeners do not place their attention in formal or structural elements to create a narrative through formal associations.

2.3.4 Plural Harmony

The spatial setup and the continuous sound behavior of *La línea* invites the listeners into a seemingly non-narrative experiential territory. Each listener is in a particular position to receive the sound in a different way. The spatial and sonic characteristics of *La línea* can be perceived as part of an open form which offers multiple perspectives. The openness resulting from the disposition of musicians and audience sets the conditions for a singular experience within a shared plurality. This open nature can be related to immersive experiences in which the immersants perceive themselves in a shared space interacting from their own perspective. In *La línea*, the immersive environment results from the experiential sharing that occurs within the continuous sonic and spatial transformations.

By composing the continuous sonic texture of *La línea* I intend to make it difficult for the audience to recognize specific spatial patterns and defined points in space. Uninterrupted repetitive motifs without contrasting events and long lasting drones are common characteristics in traditional immersive practices. On the other hand, contrasting events and irregularity can maintain someone's attention, shifting in between different forms of expectation and also changing one's mind states. Change invites the listener into inventive participation and formal awareness. This creates a dialogue where the source imposes its formal presence and presents itself as "an other". Continuity blurs this separation. In *La línea*, the continuous presence of stimuli transforms its perceived referential origins into an experiential and characteristic environmental constant. From this perspective, continuity seems to be an essential feature in the achievement of an open perceptual space. As well, in this space, formal narrative seems to lose importance.

From a musical perspective, it is common to compose a development or a kind of directional flow for producing perceptual transformations. To achieve a perceptual transformation, the listeners do not have to acknowledge that there is a musical process that guides them. This approach differs from sound installations where the listeners can walk and move freely, creating their own musical flow. It is common that in sound installations, visitors can enter at any moment. This gives them more freedom to follow their own path which differs from the linear presentation of events of musical works. When an invented reality is created as a simulation, it does not necessarily require a predesigned directionality, but mainly the establishment of experiential conditions and open interactive elements. It is more habitual to find non-directional (or non-guided) approaches in sound art than in a music concert context. Directionality is characteristic of western classical music. Composers commonly decide the order of sonic events in their compositions. This often leads to an imposition of directionality, whereas non-directionality seems to be an essential characteristic of immersive and open experiences. Nevertheless, when there is a total absence of musical guidance, the special qualities of the offered sonic event or environment may transform into an experiential normality. In everyday life, we constantly relate to multiple sonic events that might or might not have a musical impression. In sound installations that depend on the listeners' free interaction, there is no need for composing sound events in time, because the listeners will be responsible for the duration and transformation of the sonic events themselves. This makes me establish a clear differentiation between immersive music and immersive sound environments. Music is more often composed considering a linear presentation of events within an specific time frame. In this way, music aids experience through a sonic guidance, while a sound installation does not necessarily aim at being musical in a guided or linear sense. This does not mean that an installation will not be perceived musically by the visitors. A non-guided installation offers an open sonic environment that the listeners can perceive from their own multiple and particular perspectives. But in these cases the linearity and temporal frames, which are commonly associated to diverse musical practices, are absent.

Through listening to immersive music, the audience experiences perceptual transformations which blur or hide the music's structural qualities (diminishing critical awareness). This listening process goes against an Adornian "adequate listening". Theodor W. Adorno classifies types of music listeners in a hierarchic structure (he does not present it clearly as such but the hierarchy can be deduced by his qualitative arguments). For Adorno the adequate listeners are the *expert* type (on top of the hierarchic structure), and the *good* type.[38] For Adorno, the *experts* (mostly musicians) are the listeners that are fully conscious of the musical structure. They are able to identify parts of the structure and participate by imagining formal possibilities. The good listeners are also "structural listeners" but they do not have the musical knowledge to identify technical details. Their associations are a result of a natural talent (for Adorno this type of listener is "a musical person"). From the perspective of immersion, it is quite problematic to categorize listeners in this way. Furthermore, the diversity of listening attitudes of an audience makes this hierarchy less convincing.

In order to avoid this hierarchic perspective, composers may aim at blurring referential, structural, and conventional elements by offering a work open to multiple perceptions and interpretations. I perceive a similar concern in some of the works of György Ligeti. In the fragment below Ligeti describes his orchestral work *Apparitions* (1958-59) as the result of the interaction between "states" and "events":

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[38] In a less clear hierarchic order, Adorno describes the other listener types: *culture consumer*, *emotional listener*, *resentment listener* and the listeners to whom *music is entertainment*. On the lowest level one finds the *indifferent*, *unmusical* and *anti-musical* listeners. I will not discuss these types. The argument I am presenting is related to the *expert* and *good* listener type.

> The musical form has its origin in a continuous interaction between states and events. The states are interrupted by suddenly appearing events and are changed by their influence; and vice versa: The altered states also have a certain influence on the nature of the events; for the latter must always be new in character in order to continue to change the altered state. In this way, an unceasing transformation is created (Ligeti 1967: 169, translated by Erik Christensen).[39]

Erik Christensen refers to the phenomena that Ligeti describes in the quote above as transformations of energy (Christensen 1996: 29). Ligeti's "unceasing transformation" seems to create a continuous flow which gives the music an open character rather than a framed structure. Approaching musical material as transformations of energy can be considered an "immersive attitude" because this approach implies an experiential goal that is not related to a particular formal perception of the work. From this perspective, the goal of composers is not to reveal structural material but to offer an experiential space open to diverse interpretations. The sonic result of *Apparitions* does not clearly exemplify the notion of transformations of energy. The sudden "apparitions" of new contrasting events still may be perceived as isolated events which fragment the piece. Erik Christensen describes how Ligeti's notions were further developed and improved in the orchestral work *Atmosphères* (1961):

> This is music without melodic or rhythmic gestalts, and without clearly discernible pitches and durations. *Atmosphères* is a flow of sound. Subtle changes in timbre, intensity and movement create auditory impressions of variable sound masses appearing and disappearing, approaching, passing and withdrawing (Christensen 1996: 29-30).

From Christensen's perspective, for the creation of a continuous flow or transformation it seems essential, on the one hand, to continuously renew the character of the appearing events and on the other to present material in a way that is not clearly discernible. The immersive quality in *Atmosphères* seems to rely in the latter. *Atmosphères* consists of one continuous flow in which Ligeti did not intend to present the work in perceivable fragments.

The concept of "micropolyphony", as defined by Ligeti, describes a musical process which intends to not reveal the structure of the material; it radicalizes a traditional practice (polyphony) to obtain new sonic effects. Ligeti describes this style in relation to *Atmosphères* in the following quotes:

> My music is a continuous flow, unbroken by bars, like a Gregorian melody. You could not analyze it according to Riemann's rules.[40]

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[39] "States" refer to continuous musical flows that are perceived as continuous and not radically changing musical environments. "Events" are occurrences that appear influencing the sonic nature of the musical flow.

[40] Hugo Riemann (1849-1919) was a German composer and music theorist. Due to his theoretical works on musical harmony, Riemann is considered to be one of the founders of modern music theory and an important influence for modern musicology (Encyclopædia Britannica). Ligeti is referring to the positivistic methodologies that are characteristic of Riemann's theories.

> The thematic-motival structure and its role in the progress of music is almost completely abandoned.
>
> *Atmosphères* is just a floating, fluctuating sound, although it is polyphonic. *Atmosphères* […] have a dense canonic structure. But you cannot actually hear the polyphony, the canon. You hear a kind of impenetrable texture, a very densely woven cobweb. I have retained melodic lines in the process of composition, they are governed by rules as strict as Palestrina's or those of the Flemish school, but the rules of this polyphony are worked out by me. The polyphonic structure does not actually come through, you cannot hear it; it remains hidden in a microscopic, under-water world, to us inaudible (Ligeti 1983: 14-15).

The quotes describe musical characteristics that correspond to immersive notions. The sonic outcomes of micropolyphony can be described as being of an immersive nature, deviating from music which exposes its processes through the sonic result. From this perspective, I consider Ligeti's musical goals to be of an immersive nature and that his micropolyphonic works such as *Atmosphères* represent a historical opening towards music of immersive characteristics. However, the compositional processes of Ligeti still have a traditional origin. Melodies and counterpoint are used to create the "cobweb". For example, canons are perceived as processes of accumulation and densification or as shifts and openings of pitch ranges. These characteristics, which relate to pitch contour, correspond to earlier forms of counterpoint such as renaissance motets or early baroque fugues. The overall micropolyphonic texture in Ligeti's music inherits a sense of directionality that is related to pitch range and variations in density.

Atmosphères guides the listener through a sonic flow that is musically designed with an underlying structure that is not clearly presented on the sonic surface. An underlying musical structure which guides the listener is one of the main traits that differentiate a musical immersion with other forms of immersion. This reveals that structural listening is not the main goal in creating immersive compositions but only one of the perceptual possibilities. I consider "guiding", from a composer's perspective, as a necessity to achieve a "musical" immersive experience. However, in *La línea,* my immersive goal is to create music where listeners do not perceive the presence of a direction despite being guided. I intend that the listeners maintain an open attitude through the full duration of the musical piece.

The sonic result of *La línea* resembles a micropolyphonic texture as in Ligeti's music. However, in the case of *La línea* the sonic outcomes result from the spatial mechanisms and not from a reinterpretation of traditional approaches such as polyphony. In order to create a continuous and immersive musical texture such as the one in *La línea* it is not necessary to depart from traditional processes. In *La línea* the spatial mechanisms produce multilayered textures which do not have a polyphonic origin. The resulting harmonic development creates gradual and continuous perceptual transformations. The harmonic changes are not evident due to the continuous texture, spatialization and the slowness of transformation processes. Also, the initial standardization of a microtonal pitch color and the rotational qualities make it difficult to specify when and how the sounds transform.

In the last third of the piece, the pitch range starts to open out from the circle's axis. The first fixed-range starts to slowly open during the four stages shown below (Figure 21). Each stage adds a semitone to each interval that moves away from the axis. The intended slow opening of the pitch range would have been even better disguised by adding a quarter-tone during each stage. However, the tuning of the guitars would have needed to change during every stage, and to do this precisely required a level of complication that did not fit the flowing behavior of the performance.

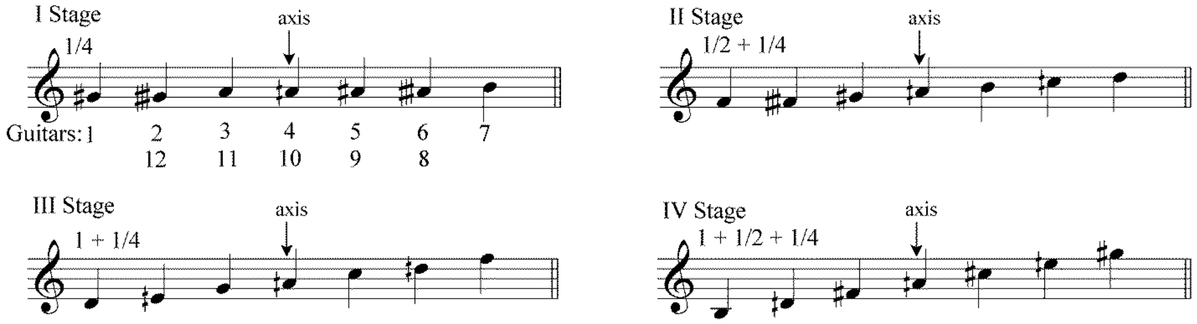
I Stage
1/4
axis
Guitars: 1 2 3 4 5 6 7
12 11 10 9 8
II Stage
1/2 + 1/4
axis
III Stage
1 + 1/4
axis
IV Stage
1 + 1/2 + 1/4
axis

Figure 21 Pitch range opening process in four stages.

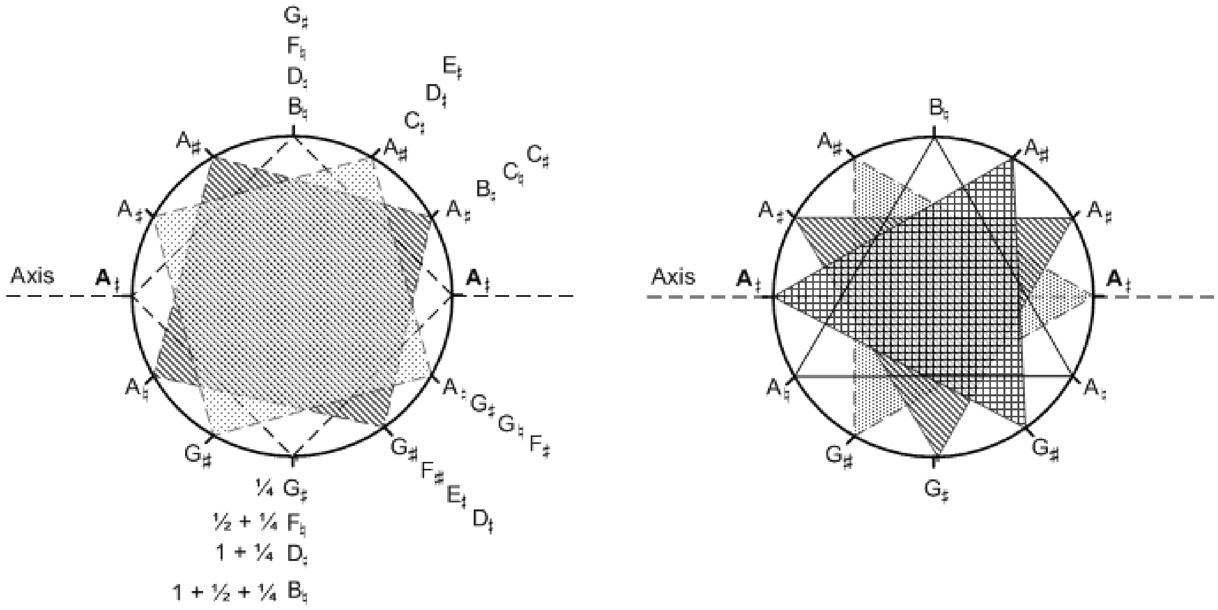
G♯
F♮
D
B♮
E
D
C
C♯
C♮
B
A♯
A♯
A
A
Axis
A
A
A♮
A
G♯
G
G♮
F
G♯
F♯
E
D
¼ G
½ + ¼ F♮
1 + ¼ D
1 + ½ + ¼ B♮
B♮
A♯
A♯
A
A
Axis
A
A
A♮
A
G♯
G♯
G

Figure 22 Square chords describing pitch range opening process. Triangle chords (right).

During this process of opening the pitch range, the continuous tremolo texture is still the main sound behavior. The new sounds of each stage appear as crescendos that rise out from a sonic flow built from many pitches. As the disposition of pitches gradually opens within this flow, harmonic colors start to be perceived (as chords). These harmonic pitch groups are built from square and triangle rotating cycles (Figure 22). Chords cross fade rotating from one square (or triangle) to the next. This produces a continuous harmonic movement in space that blurs the specific location of each chord. The cross-fade space in between guitars adds a new harmonic and spatial layer to the harmony defined by each sound source. The overlapping of chords creates a spatial multi-directionality where each listener experiences his/her own harmonic context.

In the beginning of the piece, each listener experiences the motion of sound through space in a particular way due to their unique position. Pitch is initially used to aid the perception of physical movement in space and it is divested of a traditional harmonic sense (as chords or modal colors). The pitch material in the first two thirds of the piece is a microtonal cluster within a minor third, and as this interval never stays in a fixed spatial disposition it is hard to recognize. The resulting pitch texture does not produce audible chords or characteristic harmonic colors. The transition from this close range (minor third frame) towards open harmonies is very slow. The goal of this slow process is that the spatial and sensorial perception produced in the beginning blends gradually with a more familiar harmonic listening. The new harmonic layer appears gradually as a new music that moves within the nature of the spatial music from the previous fragments. Simultaneously, the opening pitch range expands the physical and virtual spaces (as seen earlier in Figure 16). As a result, the opening range of pitches can be imagined as sounds that reach out further into the surrounding environment. In this way, the surrounding space that was being affected by a spatialized sonic process, which could be perceived mainly as a music that emphasizes spatialization, is gradually being transformed by a new harmonic musicality. In *La línea,* the spatialized beginning moves towards a harmonic experience that opens a new virtual space within the spatial nature of the piece.

In *La línea* the opening harmonies result from spatial processes and not from a solely harmonic approach. As a result, the harmonies are displayed in diverse physical and virtual (referent to pitch in the musical dimensions) dispositions simultaneously. Even if my approach did not depart from a more conventional use of harmony I perceived an aesthetic familiarity when listening to the harmonic opening. There is a cultural conditioning within the aesthetic (sometimes perceived as emotional) associations of harmony. Most of the music that is reproduced in public spaces (cinemas, elevators, waiting halls, supermarkets, cafes, restaurants, bars, in the streets, etc.) of the western world have harmonic characteristics that can be related to the tonal system. Tonal harmonies continuously raise, disappear and blend within the western cities' soundscape. In *Singing Neanderthals: The Origins of Music, Language, Mind and Body,* Steven Mithen states that there is a connection between aesthetic preference and the tonal systems that belong to western culture (Mithen 2005: 52). With this argument, Mithen suggests that there are prevalent types of harmonies in western sonic environments and that society prefers the harmonies that they are more often exposed to.

This argument can be further contextualized by exploring how listeners create this association. In "Attitudinal Effects of Mere Exposure" (Zajonc 1968) the social psychologist Robert Zajonc proves through a series of tests "that mere repeated exposure of the individual to a stimulus object enhances his attitude toward it. By 'mere' exposure is meant a condition making the stimulus accessible to the individual's perception" (Zajonc 1968: 1). This article explores aesthetic and emotional appreciations in relation to language and symbol perception. The few musical experiments presented in Zajonc's investigation demonstrate how repeated exposure to a type of music can enhance the listeners' affinity towards it. In the article *Absolute Pitch as a Learned Phenomenon: Evidence Consistent with the Hick-Hyman Law,* the music cognition researchers Jasba Simpson and David Huron prove the correlation between repetitive exposure to Western music and acquiring absolute pitch:

> An analysis reaction time data collected by Miyazaki (1989) provides additional support for absolute pitch as a learned phenomenon. Specifically, the data are shown to be consistent with the Hick-Hyman law, which relates the reaction time for a given stimulus to its expected frequency of occurrence. The frequencies of occurrence are estimated by analyzing a computer-based sample of Western music. The results are consistent with the view that absolute pitch is acquired through ordinary exposure to the pitches of Western music (Simpson and Huron 1994: 267-270).

Simpson and Huron's research could be associated to the research of Robert Zajonc. Tonal preferences arise as a result of listening repeatedly to a limited amount of musical models. The Hick-Hyman law suggests that there is tendency to discard among the unknown choices and to frame our choices among the most familiar ones. Correspondingly, we can deduce that our aesthetic choices could also be conditioned by these laws.

From a historical point of view, the sole existence of the terms "consonance" and "dissonance" elucidate the conditioning association which has been created between harmonic relations and aesthetic perception. The "doctrine of the affects" in the Baroque period established a dependency between harmony and emotions (the doctrine derives from earlier notions, as in the specific moods assigned to Greek modes). Although the affects were used rigidly during a short historical period, the association between harmony and musical aesthetic continues to echo up to the composers of today. Affects created an aesthetic archetype that evolved into a diversity of emotional-harmonic conventions.

As a result, it is difficult to ignore that the predominant harmonic environment affects and conditions the way in which music is perceived and composed, despite the diversity of approaches that are used to develop pitch material (microtonal, spectral, serial, mathematical, spatial, aleatoric and others). My intention is not to state that harmonic conventions are universal features of music but an influencing factor in the creative process and in the receptive effect. From a composer's perspective it is important to not take these notions (affections, consonance, dissonance, etc.) as empirical facts. The composer Horacio Vaggione argues: "Of course, there are primitive principles underlying musical practices, but these should not be qualified as foundations of 'music itself,' for this would negate the possibility of developing other musical practices related to different assumptions" (Vaggione 2001: 55).

In order to approach immersion from a compositional perspective, it is necessary to acknowledge and observe critically the determining and influencing effects that music has on listeners' everyday life.

2.4 Reflection

The rotational and pitch processes presented above demonstrate how the mutual influence between imaginary and physical spaces gives form to the musical result of *La línea*. By presenting these processes, I intended to reveal the musical origin from which I developed the opening arguments of this chapter. These processes elucidate a compositional approach that departs from a musical virtual space that is always moving towards and interacting with physical reality.

As argued by Erik Christensen, the interaction of musical dimensions creates a perceptual virtual space. Generally, composers develop their compositions without taking into consideration how musical dimensions relate and interact with the physical space. This implies that composers usually aim at an immersive experience within this virtuality. The use of spatialization in Xenakis also reveals his interest in creating a self-contained virtual space, despite the different spatial disposition of the performers in some of his works. On the other hand, in *La línea*, the multiple interactions that occur between the virtual characteristics of music and the physical reality were taken into consideration to develop the composition. As a result, the physical space transforms the perception of the musical outcome and vice versa, the musical outcome transforms the perception of the physical space. From this perspective, immersion is not thought of as the experience of a self-contained virtuality, but as the experience of multiple realities that are transformed through their interaction.

The harmonic processes of *La línea* trace a slow transition that begins from the presentation and definition of an experiential territory towards an increasing harmonic musicality and increasing rhythmic changes. The harmonic opening occurs within a spatial composition that combines multiple and diverse perceptual perspectives. As a result, harmony is not only a color displayed linearly in time, but a musical layer displayed in physical and virtual spaces exposing their interaction and multiplicity with an aesthetic sense.

Chapter 3

On *Eufótica*

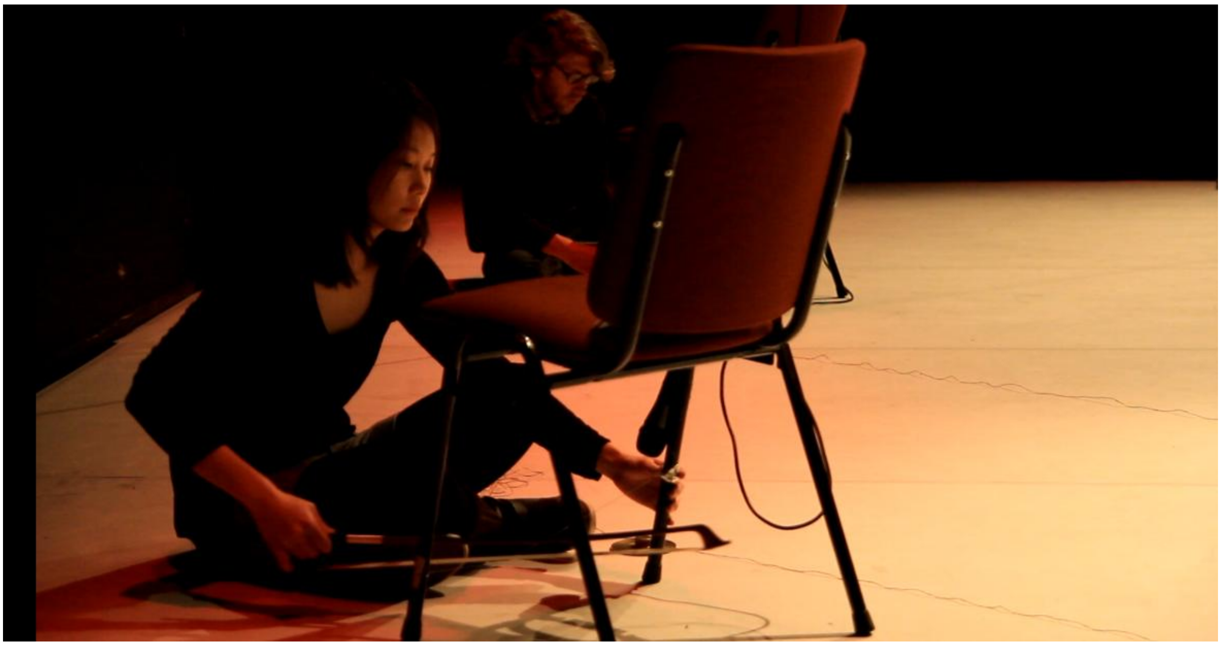

Figure 1 *Eufótica* (2010), performance at Theater De Gouvernestraat, Rotterdam, March 23, 2011.

3.1 Introduction

Eufótica for six musicians and tape was commissioned for the "XX Festival de Musica Contemporanea UC" (20th Contemporary Music Festival of the Catholic University of Chile, Santiago, November, 2010). I continued developing this work during a residency (November 2010-January 2011) in Loos Studio in The Hague. The main instrument used by each player is a chair with a metallic wire tied between its legs (Figure 1).

In this chapter, I will present general notions of sound perception under water, focusing mainly on sound localization by human listeners. In *Eufótica*, the characteristics of sound perception underwater are used as a reference for designing the visual and spatial setup. I did not try to emulate in an exact way underwater sonic conditions, but attempted to freely use these notions of underwater sound perception to develop musical material and spatial relations. Having underwater auditory perception as a reference for approaching the composition brings diverse problems which can be represented in virtual, physical and symbolic ways. In any case, departing from the nature of a different environment transforms the perspective from which common musical elements, such as harmony, rhythm, counterpoint or dynamics, are approached. The conventional characteristics of the performance space are brought into relation with spatial visual-aural ideas that do not correspond to the physical logic of a traditional concert environment. In *Eufótica* this approach resulted in various perceptual illusions that trigger a spatial awareness in the listener.

As in *La linea desde el Centro,* I intended in *Eufótica* to blur the perceptual boundaries between the musical time-space and the surrounding environment (non-musical time-space). I composed *Eufótica* bearing in mind the traditional context and conventional characteristics of the hall where it was going to be performed. In this chapter, I continue to propose that it is possible to use conventional characteristics of traditional music contexts to open different forms of relating to the surrounding environment, as well as inducing a mode of aesthetic appreciation in the listeners that will last beyond the time of the performance.

I will consider the special listening attitudes of exclusive attention towards concert contexts as an aspect of enculturation. Listeners who often go to concerts may perceive their entrance to the hall, their clapping when the music finishes, or the audience-stage duality as natural aspects of the concert ritual. Therefore, the conventions and habits of these contexts can be approached as musical material that can be molded to achieve new perceptual and psychological experiences. For example, music concerts can be understood as ubiquitous and conventional rituals. In a concert context there are ritualistic features that are common for an audience. This implies that there are habitual expected conditions and a traditional order of events. The habits that mold the concert experience offer a comfortable position for listening to music. When having in consideration the comfort of the concert ritual, it is possible to re-ritualize this process while transforming the conventions in order to make the audience perceive a multiplicity of experiential layers with a new perspective. From my composer's perspective, I propose that the conventional elements can be exposed and used to generate new artistic ideas. The conventions can become a source of musical material and in some cases intended to be present in the musical setup. Hence, by transforming conventions I do not intend to negate them nor aim at achieving an original result but to generate an interaction between conventions and newer performance situations in order to expose a multiplicity of experiential layers.

One of the re-ritualization characteristics of *Eufótica* is reflected in the special disposition of musicians, audience and loudspeakers in space. The goal was to recompose the spatial setup of the concert space in order to avoid automatic attitudes towards music listening. The re-disposition of musicians within a conventional space is not a new practice. I consider that it is more common to think of the performance space as a closed structure (as in Xenakis' approach described in the previous chapter) even with the possible variations of spatialization. In *Eufótica* as well as in *La linea desde el centro,* I question this "closed" approach. Therefore, I explore the relations between events inside a circular setup with the physical space outside of it. Through this chapter I will demonstrate how this multi-spatial concern influenced the resulting musical processes and affected my approach towards the sound sources in their sonic and visual presentation.

Moreover, this chapter reflects on the idea that the creation of completely new contexts without taking into consideration listener habits and performance conventions might just result in experiential idealizations. Relocating music to unconventional contexts tends to make music blend into the multiple experiential layers of society's daily routines that listeners would, in any case, naturally experience as multiple. The overlapping of diverse musical and sound stimuli within daily life creates a homogeneous texture of layers of experience where aesthetic appreciations blur, rise and change. Many express forms of immersion are constantly occurring, overlapping and transitioning in everyday life.[41] Everyday experiences which affect aesthetic appreciations of reality do not necessarily have a critical or a significant lasting effect. Because of this ephemeral quality, the constant variety and simultaneous stimuli of modern everyday life, I propose that immersive environments that are created with the goal of producing significant critical and aesthetic effects depend on their contrast from these everyday situations (in reference to Ruth Herbert's examples).

As the meaning of *Eufótica* suggests (described in the following sub-chapter), the immersive environment should not make the listeners completely dissociate from their surrounding physical space. Through *Eufótica,* I will describe an approach towards immersion as an experience of simultaneous co-existing realities. I consider a conventional musical context as a comfortable space where immersion can easily occur as a form of dissociation from reality. In *Eufótica,* I explore what the differences are that might avoid this sense of total dissociation. Avoiding dissociation might be perceived as contradicting some of the definitions of immersion. In the case of *Eufótica,* the intended immersive environment must be understood as a filter that transforms the mode of awareness where different layers of experience overlap. What is music? What is virtual? What is real? What is sounding? From where? Immersion in *Eufótica* intends to offer the simultaneous experience of all these questions.

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[41] Here the term "express" means rapid, efficient and transitory, as when used in relation to delivery.

3.2 Diving: immersion as a metaphor of underwater experiences

3.2.1 The title

Entering into an immersive experience can be understood as entering into a special conscious mode, or into a special physical space which can be identified as different from a mode of full awakeness or a normal physical reality. This notion can lead to the idea that immersion occurs within a framed environment that is surrounded by an external one. The identification of a characteristic immersive period of time suggests that there is a going-in and a going-out, a pre and a post time-space to the duration of immersion. For example, when describing an underwater immersion, the commonly used terms *submerge* and *emerge* represent the transitions that separate two different environments. From this point of view, it is easy to observe the immersive time-space isolated or separated from that which surrounds it. This separation can be perceived as a duality: immersion implies an interiority that has a corresponding exteriority. The immersive reality can be perceived as an "other" and as "different" in relation to the environment that surrounds the experience. This duality can also be associated with the relation between simulated environments and their real referents. By using the term simulation, one knows that the experience offered by the simulator refers to a copy of reality. Therefore, the simulated realities automatically enhance their perceived separation from reality. A simulation is not reality or something in between realities. It is a copy. When I enter into a flight simulator, I immediately know that it is not the real thing despite the verisimilitude of the experience. These dualisms do not correspond to the immersive experience that I study and reflect in *Eufótica*. In this case, immersion occurs through perceptual transitions and also through the experience of multiple experiential layers. The meaning of the term *Eufótica* serves me to exemplify these notions.

I came across the name *Eufótica* (Spanish for *euphotic*) while reading oceanographic literature after the composition was finished.

> The *photic zone* is the surface layer of the ocean that receives sunlight. The uppermost 80 m (260 feet) or more of the ocean, which is sufficiently illuminated to permit photosynthesis by phytoplankton and plants, is called the *euphotic zone* (Greek for "well lit": *εὖ* "good" + *φῶς* "light") (Encyclopædia Britannica).

Through this term, I was able to, metaphorically, represent the kind of musical experience that *Eufótica* would produce. The sunlight establishes an uninterrupted connection between the immersive environment and the external world. It establishes a link between the underwater world and the outside.

The term *Eufótica* can be related to an immersive environment that lives in co-existence with the environment that surrounds it. Light penetrates the environment to give life to it. Both the euphotic and external world share a dependence on light to produce life. As an analogy to a musical immersive experience, the euphotic maximum depth represents an experiential border, establishing the differences between what is below and within the photic zone. An experience "below" represents a total detachment from the surrounding reality. On the other hand, an experience "within" represents an immersion in which the immersant is able to observe and simultaneously experience, from the perspective of a transformed conscious mode or physical state, multiple realities. The immersive time-space merges with what is perceived as “external”. The perceptual differences between the sensorial transformations caused by the fluid (or different) environment and reality are blurred.[42]

These notions relate to the idea of absorption as described by Ruth Herbert:

> Absorbing experiences commonly occur when individuals feel focused, balanced or pleasantly dreamy. Episodes demonstrate a preoccupation with/immersion in sensation, and alterations of consciousness are noticed retrospectively (Herbert 2011: 100).

In this quote, absorption is described as an immersive process within a mode of awareness, and not as a mode of dissociation. Immersion, in this case, functions as a form of engagement. In relation to everyday music listening, Herbert describes the “multimodal” nature of experiences of absorption:

> Although everyday absorbed trancing may be strongly emotionally arousing and intense, more common is a low arousal type of experience that is commonly multimodal in nature: where the listener engages spontaneously in a performative blending together of sights, sounds and activities. This confirms that the use of music in contexts where attention is divided in between various activities or stimuli is not *necessarily* superficial: descriptions of music in such scenarios as functioning as ‘sonic wallpaper’ that is ‘barely perceived’ (North et al., 2004), may simply be missing the point that music has the capacity to become one of several impacts that, when combined, yield experiences that are potentially richly involving (Herbert 2011: 105-106).

When translated into a composer’s practice, the previous arguments offer an immersive perspective towards composition: when taking into consideration all the aspects of the performance context, then the creative focus moves not only towards the aesthetic object but instead mainly towards the relations between the aesthetic proposal and its context. This suggests that an immersive approach would be a method of composing according to these relations. From this perspective, the aesthetic object loses its main role, and it both works as a part of and furthers the immersive experience.

As already mentioned in Chapter 2 (page 66), Herbert describes absorption and dissociation as being self-regulatory processes that serve as resting and recovery mechanisms. However, through music, these mechanisms are more evident in dissociation. “Dissociative trancing via music emerges as a common but acknowledged strategy with which to deal with the vicissitudes of everyday life (…)” (Herbert 2011: 106). Dissociation can also occur in engagement. When special attention is given to music listening, it can induce a dissociative mode. This also occurs in virtual realities that approach immersion as a self-contained space. In both cases, in engaged or passive listening, dissociation implies a detachment or a distancing from the environment. For this reason, absorption, despite being also considered a rest mechanism, and commonly associated with dissociation, is a term that better relates to my approach to immersion as a multilayered experience.

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[42] The painting “Der Jungbrunnen” (cover) by the Serbian painter Goran Djurović is related to this argument. The human figures in the painting are partly submersed. They are able to observe the substance from an external position while they are simultaneously immersed in it. I also perceive this as the ability to observe oneself through a transformed state.

However, from a composer's perspective, it is important to relocate these notions, associated to everydayness, into a special context. Absorption and dissociation in the context of everydayness can be related to the idea of "falling" as formulated by Martin Heidegger. Richard Polt describes "falling" as follows:

> Falling is the movement or direction of everyday Being-in-the-world. Everyday Dasein exists as a they-self, and is wrapped up in what it is doing, which it understands in a superficial and conventional manner (Polt 1999: 75).

According to Polt, for Heidegger, "(...) falling is a permanent tendency in the human condition" (Polt 1999: 76). In this way, falling describes a tendency towards habits. The everyday experiences described by Ruth Herbert occur within a realm of normality and they can be associated to a sense of falling.[43] These kinds of everyday immersions do not necessarily cause a consequential effect. The special attention demanded in artistic contexts contrasts with these habitual events, mainly because of the audience's conscious decision to attend an artistic event. This decision implies that the audience willingly gives a more exclusive attention towards the artistic form presented. This exclusive attention may result in a less multilayered experience than in an everyday situation mediated by music. Moreover, special attention itself does not guarantee that the artistic event will produce a more aware or open immersive experience. The initial special connotation that one gives to an artistic space, despite the common conventional usage of these spaces, serves as a point of departure for approaching composition in relation to the diverse layers that build up the performance experience. This approach points towards a questioning of the habitual automatisms of the creative process and of the conventions of performance contexts.

The photic zone acts as a metaphor of a special environment that is not perceived as separated from other layers of reality. From this perspective, *Eufótica* intends to keep the special connotation of a concert context, while blurring the conventions that generally would make one perceive the musical experience as separated from that which surrounds it.

3.2.2 Underwater sound perception

By describing the differences between sound localization in air and sound localization underwater, I intend to present the context that gave form to the ideas in *Eufótica.* Reflecting on how these ideas influenced the way the composition operates, was the departure point for developing the arguments discussed in this chapter.

Sound localization in air occurs due to the interaction between the sound wave produced by a source and the auditory apparatus and the head. Differences of phase and intensity of a sound wave provides information for the localization of a sound source:

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[43] "Realm of normality" refers to our everyday context in which we have various kinds of experiences that we consider as normal or habitual.

> Directional perception of sound in air is based on the utilization of phase (time-of-arrival) and/or intensity information provided by the arriving signal to the auditory mechanism. For the low frequencies, time differences appear to be the most important and the arrival of sound at one ear (versus its arrival at the opposite ear) can vary up to 0.6-0.7 msec. At higher frequencies the head creates a shadow effect which in turn produces a marked difference in intensity between the two ears (Hollien 1973: 1288).[44]

The intensity differences are referred to as ILDs (interaural level differences). The phase differences are referred as IPD (interaural phase difference) (Middlebrooks and Green 1991: 140). As mentioned above, each of these mechanisms correspond to the perception of high and low frequencies. This differentiation describes a dual theory:

> The notion that spatial information is derived from at high frequencies from ILDs and at low frequencies from IPDs is often referred to as the duplex theory of sound localization (Middlebrooks and Green 1991: 140).

As I will explain later, the duplex theory relates to how humans listen underwater. The acoustic properties of water are different than that of air. The ability to locate sound sources is reduced underwater. The faster speed of sound and the similarity between the impedance of the skull and the surrounding water substantially reduces the shadow effect experienced in air.

> First, sound velocity is greater in water than it is in air by a factor of from 4 to 5 (depending on salinity, temperature, etc.). Because of this many fold increase in the speed of sound, the difference in time of an arriving signal between the two ears would be correspondingly diminished, thus potentially eliminating or severely reducing directional perception.
>
> Another factor which also operates to reduce underwater sound localization is related to the intensity differential (shadow effect) that permits the auditory processing in air of the directionality of higher frequency signals. Briefly, this effect is present in air because of the mechanical impedance of the head, i.e., normally the impedance mismatch between air and solids (such as the head) is sufficiently great so that the head constitutes an effective acoustic barrier. This relationship does not hold in water as the impedance of the head is similar to that of the fluid. Therefore, sounds virtually go through the skull, reducing by a substantial magnitude (or eliminating altogether) the shadowing effect and its concomitant intensity differential. Such a situation further reduces man's potential ability to localize sounds underwater (Hollien 1973: 1288).

In this quote, the phenomenon known as bone-conduction is described ("sounds virtually go through the skull"). The sound travels through the skull reaching the cochlea (Hollien 1973: 1289), and is later on processed in the brain as usual. As sounds underwater are perceived through bone-conduction, depth changes do not attenuate humans' ability to listen underwater (Ridgway et al. 2001: 3829). As a result, one might deduce that since the sounds have to pass through the body to reach the auditory system, that which is perceived is a more involved listening experience. "Sound in water can propagate relatively freely through the human body, as the acoustic properties of human tissue and water are similar" (Anthony, Wright and Evans 2009: iii). In air, bone-conduction does not appear to have much effect in sound localization, while underwater, bone-conduction is one of the main mechanisms of sound localization. This appears to be one of the main differences between air and underwater listening.

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[44] Dr Harry Hollien is professor of linguistics, speech and criminal justice at University of Florida. He is responsible for various articles on human sound localization underwater.

Investigations on diver sound localization prove that tympanic conduction also participates in underwater listening and localization.

> Although underwater hearing is not fully understood, the likely explanation is that both bone conduction and tympanic sound conduction produce hearing underwater, the so-called dual path theory. At low frequencies tympanic conduction appears to predominate and this may explain why sound localization is more acute at these frequencies. At high frequencies, bone conduction is considered to be the dominant factor (Anthony, Wright and Evans 2009: 7).

This quote implies that the correspondence between underwater bone conduction and the perception of high frequencies can be associated to the ILDs of air listening. Bone-conduction (corresponding to ILD) and tympanic conduction (corresponding to IPD) create a dual mechanism of sound localization underwater that resembles the duplex theory as it happens in surface conditions.[45] The quote also indicates that there exists an essential difference between land and underwater localization. On land, it is easier to localize higher frequencies, and underwater, lower frequencies. Sounds in air from 250 Hz downwards lose their directional quality as they propagate almost equally in every direction around the sound source. Sounds around 1000 Hz and higher have a better directivity.

Despite one's reduced ability to localize sounds underwater, studies on the ability of divers to localize sounds indicate that localization underwater is possible under determined conditions.

> Recent experiments have shown that auditory localization cues are sufficient to allow relatively precise sound localization under water. Moreover, it has been demonstrated that under controlled conditions divers are able to localize and navigate to sound beacons (Hollien and Hicks 1983). This research and practical experience have shown that not every diver is able to localize and navigate to sound beacons under all conditions. In general, successful sound localization and navigation depend on clearly audible pulsed signals of short duration that have frequency components below 1500 Hz and above 35,000 Hz and are pulsed with a fast rise/decay time (National Oceanic and Atmospheric Administration NOAA 1991: 60).

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[45] "Surface conditions" refer to sensory conditions in air, as it is presented in the *NOAA Diving Manual: Diving for Science and Technology*. Throughout the text, I will address air sensory conditions as "surface conditions".

As described above, specific frequency ranges and duration (short attacks) aid in achieving sound localization. Through using "clearly audible", the authors emphasize the importance of sound intensity in sound localization underwater. The ear's sensitivity to pressure changes is highly reduced underwater. In order to hear sonic stimuli underwater, they have to be louder. The quote below clearly describes this phenomenon:

> The human ear is an extremely sensitive pressure detector in air, but it is less efficient in water. A sound must therefore be more intense in water (+ 20 dB to 60 dB, SPL [sound pressure level]) to be heard. Hearing under water is very similar to trying to hear with a conductive hearing loss under surface conditions: a smaller shift in pressure is required to hear sounds at the extreme high and low frequencies, because the ear is not as sensitive at these frequencies (National Oceanic and Atmospheric Administration NOAA 1991: 60).

The need for a stronger intensity shows how the density of our body is an obstacle for the sound wave to reach our ear. This also emphasizes the notion that humans listen to sound also through their skin and body. As a consequence, underwater listening can be understood as an embodied and resonant experience.

3.2.3 Why underwater?

Sounds in the environment (surface conditions) place us in reference to diverse and distant sound sources. Particular localizations clash with all-involving immersive notions discussed in the previous chapters. When we listen to a sound at a distance coming from our right side it is not perceived as coming from everywhere despite the multiple sound reflections with all of their involving sound waves that produce this particular localization. The source does not need to be at our right side for the sound to be perceived as coming from our right. A reflection can be perceived as the original. In any case, the identified distance and position in space achieved through localization create a particular event that can be related to a sense of separation similar to the visual process.

Sound localization, when observed as a practical everyday feature, exposes immersive notions of listening as being more theoretical than experiential. Observing the psychological and practical contexts in which listeners localize everyday sounds, makes us readers perceive some of the philosophical and phenomenological immersive ideas connected to listening as mere idealizations. Environmental sounds reveal a multiplicity of distances and surrounding forms. These sounds define the reference position of the listener. Sounds are identified as coming from somewhere, even if the distance recognized is perceived as "here". "I can perceive a distance but that is a heard distance. The distance is what I hear here, not over-there" (Voegelin 2010: 4). Voegelin describes a phenomenology of listening but does not relate it to the functional attitude with which listeners may deal with the perceived distance.

The previous paragraphs only refer to an specific and practical approach towards sound localization. The localized sounds or sources will always also reflect an *aural architecture.* In the book *Spaces Speak, Are You Listening?* Barry Blesser and Linda-Ruth Salter explore auditory spatial awareness. For the authors "...*aural architecture* refers to the properties of a space that can be experienced by listening" (Blesser and Salter 2009: 5). According to the authors, the perception of aural architecture produces diverse emotional and behavioral responses.

> Listeners react both to sound sources and spatial acoustics because each is an aural stimulus with social, cultural, and personal meaning. […] Depending on the physical design and the cultural context, aural architecture can stimulate anxiety, tranquility, socialization, isolation, frustration, fear, boredom, aesthetic pleasure, and so on (Blesser and Salter 2009: 11).

The quote above describes the mediating effect of space on psychological and physical experiences. It also implies that personal histories in relation to spaces conditions one's experiences. For example, a reverberant space could give a peaceful feeling for some while others get wary. People connect their sonic environment to their past experiences. It is not possible to create a generalized cultural context, such as in this example, since every case is conditioned by countless differences. The relevant issue is that space always mediates aural experiences. The authors approach their research on aural architecture in a similar manner to Herbert's (2011) study of the mediating effects of music in everyday life situations. The main difference between these two studies is that Blesser and Salter's book is developed making a meta-analysis of existing literature, while Ruth Herbert empirically develops her study using experiential feedback from interviews with diverse people who describe their daily experiences with music. In Blesser and Salter's case, the focus is more towards the effects of the cultural context and space itself, while in Herbert the focus is more on the psychological effects on the listeners. For a composer, it is easier to develop an argument in relation to the physical and cultural context than to the particularities of the psychology of the listener as in Herbert's study. The physical context is an integral part of the feedback loop of the compositional/performative process. However, it is important to consider both approaches as complementary. As mentioned in the quote above, "the listeners' context" is created not only by space, but also through social, cultural and personal aspects. As a consequence, I consider it important to focus on "the listeners' context", with all of the implications of the musical performance space, which in many cases condition the aesthetic experience by its traditional characteristics and conventions. These conventions create a context which listeners approach through many automatic and habitual behaviors.

Although there is always a spatial context in which the sound events are perceived, there are countless situations in which people only react to stimuli in a functional manner. For example, when I hear my mobile phone ringing on my living room table, I just go and pick it up. Space has aided me in recognizing the specific cue. Space has a functional role, as it does in many cases. This acquired behavioral pragmatism resembles many other everyday life automatic behaviors (as in the "pragmatics of the mirror" mentioned in Chapter 1). When a listener localizes a sound, he also perceives the surrounding space. That is considered normal. The source and the receiver are always projected into an acoustic context. However, this phenomenon does not imply a sense of spatial conscious awareness. This pragmatic behavior also relates to how people might perceive a performance space. Generally, people go to a concert to "see" the music, and the acoustic space is simply there, already available. Music does not necessarily produce a conscious spatial awareness despite the music being mediated through it.

What happens when listening does not reflect an aural architecture? As just mentioned, under surface conditions (in this case I am not considering the use of headphones or other external listening apparatuses) sounds generally seem to come from "somewhere", and reveal a surrounding architecture. Sounds might appear as a reflection, or they can be directly identified as connected to a specific source. As described in the previous subchapter, this does not occur so simply underwater. Generally, sounds underwater are hard to localize, and they appear as a resonance through the head.

> For example, Bauer and Torick (1965) suggest that when an individual is submerged: "Sounds appear to arrive from nowhere. The location of a friend or foe becomes a matter of dangerous conjecture and reverberant sounds mix with direct sound into an unintelligible jumble." At that time, this observation seemed confirmed by de Haan (1956), Dudok van Heel (1962) and others (Hollien 1973: 1288).

Harry Hollien describes a generalized notion of sound localization ("sounds appear to come from nowhere"). This generalization can be related to the description of an aural experience underwater of any inexperienced diver. More recent investigations on divers' sound localization describe that regular training improves their sound localization abilities (Shupak et al. 2005: 130). This provides evidence that without training one would generally experience sound localization underwater in a more blurry way, connected to Hollien's experiential generalization.

Under surface conditions, people generally feel comfortably oriented by the sonic environment. When submerged underwater this comfort disappears. Where is the "nowhere" mentioned by the divers? The theories on bone-conduction refer to a mediation of the body. This suggests that the initial source of audibility is one's vibrating body. The mechanoreceptors that allow listening on surface conditions also vibrate inside the human body, but the perceived spatial sensation allows the listeners to develop a sense of distance from the sources and space. Underwater, the fluid environment and the human body resonate through sound without this sense of distance. This can be seen as a synthesis of the body with its fluid environment. With no clear spatial references, the listeners' embodiment stretches out into the surrounding media (water). Through underwater listening, the human body resonates with a sort of vibratory spatial infinity.

In this underwater context, the ontological and phenomenological ideas derived from listening and immersion have a more empirical basis than on surface conditions. The involving density and the reduced perception of spatial referents eliminate the perceived distance between objects and blur the perception of a spatial self-reference.

There are incongruities between surface and underwater sound perception. The general localization correspondence between sight and hearing that someone develops on the surface is transformed underwater. The underwater incongruity creates a perceptual space in between what divers perceive as virtual and real. The multiplicity of worlds is experienced from the perceptual incongruities.

In virtual realities (in gaming or any sort of digital emulation of physical spaces), visual events and sounds are designed correspondingly to surface sensory characteristics. This aims at perceiving the new reality as real. Audio-visual correspondence is generally used to aid full immersion (as a fully self-contained reality). Familiar sensory conditions aid in creating a virtual space that is easy to navigate. Finnish acoustics researchers Matti Gröhn, Tapio Lokki and Tapio Takala (2003) studied the differences in navigating a virtual environment when following sonic, visual or audio-visual cues to find given gates.

> A navigation test was carried out in a spatially immersive virtual environment. The test was a game-like experience where [the] task of subjects was to find as many gates as possible while they navigated through a track guided by auditory and/or visual cues of the gates. The results are presented as a function of the number of found gates, searching times, and normalized path lengths. Audio-visual navigation was clearly the most efficient. Visual navigation was the second, and the auditory navigation the least efficient. Further analysis of travel paths indicates that auditory [cues were] utilized in the beginning to locate the next gate, and visual [cues were] the most important in the final approach to the gate. [abstract] (Gröhn, Lokki and Takala 2003: 200).

The audio-visual cues create a more organic reality where two kinds of sensory stimuli respond to each other to outline the virtual space. Audio-visual cues offer more possibilities for localization. The sequential order of the cues as described above (first auditory then visual) can be associated to real localization events. Sound is perceived in every direction while vision is only perceived frontally. It is common to hear stimuli behind or beside ourselves before looking at that which is heard. The sound source can be hidden from vision in many ways. Sound attracts the attention and vision finally captures the object in a specific point. A visual encounter can also precede the sound event associated to the object. However, in this case sound is not necessary to localize the object seen, and it can be deduced from the experiment above that the visual cues give less opportunity to localize diverse objects. Sound aids in bringing attention to the unseen.

These characteristics derived from a simulated reality describe an aural pragmatism which relates to how people perceive sounds in everyday reality. Underwater sound perception clashes with this certainty. Aural pragmatism implies a more objective and practical relation to the sounds heard. Introjected aural behaviors are perceived within a sense of everydayness. The underwater localization incongruities emphasize the sensorial experience and move the listener away from these behavioral automatisms. As a consequence, the perception of sound underwater refers to a transformed reality and not to a simulation of it.

Another aspect of being underwater that is unrelated to the sonic experience is the impossibility of staying underwater. The necessity to breathe represents moments of self awareness and moments of spatial awareness of the reality outside musical time and space. Breathing implies a relationship with the external environment, which betrays the notion of a fully-immersive environment as it happens in an emulated reality. Breathing, represented in a musical context, demands a presence of openings or windows from which listeners should be able to observe and perceive that which seems to be “outside of music”. However, the musical context always mediates the way in which they look out. In this sense, the openings do not separate the listener from the musical context. Breathing has to be understood as a perceptual shift within an experience. The experience of an act of “breathing” in any musical context can just simply occur. However, the idea of breathing has persuaded me to experiment with the relations of the musical time-space with that which surrounds it. Despite being aware that breathing as a conscious process might occur naturally, I intentionally explore the musical elements that might affect these sorts of experiences to transform the way that listeners perceive conventional musical contexts. The following subchapters will describe musical processes that will demonstrate this exploration.

3.3 Compositional processes: transmutation of underwater notions

3.3.1 Thinking of spatiality without a physical source

In *Eufótica*, I developed the sonic spatial design having as reference the characteristics of sound perception underwater as previously described. I also intended to think of sound as water currents. These currents should be imagined as flows of movement through the area of the audience. The starting point for designing the sound movement should not be the sound source but the spatial sound paths themselves. As a result, my idea was to approach the musical design from the diverse positions of the listeners. I wanted to create sonic movements swirling through small areas of the audience. The main question was how I can make sound seem to make a circling movement on a specific area within the audience space or even around one person? For instance, how to create the sound of a fly circling around the head of one listener, using the resources available for me in this performance? I initially thought of more mechanical solutions which were somehow unpractical, like players moving around in between the audience or using a complex system of rails in the ceiling with hanging speakers moving from place to place. I finally did not use these solutions either.

A possible solution (but also not very practical considering that *Eufótica* is only for six musicians) could have been to create a setting similar to the one of Iannis Xenakis’ *Terretektorh* (1965/1966). This piece is written for an orchestra of 88 musicians forming six concentric circles in between the audience (Figure 2).

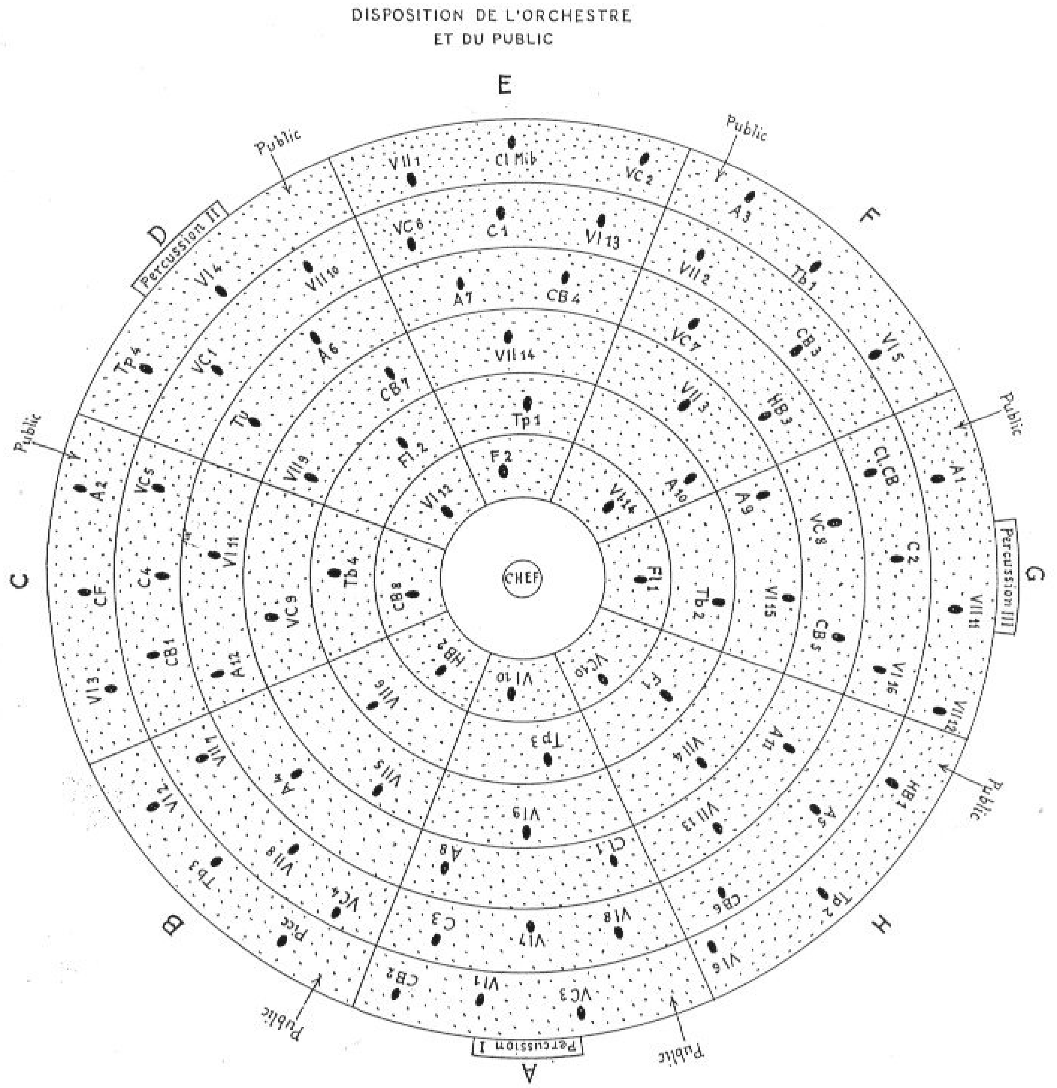

DISPOSITION DE L'ORCHESTRE
ET DU PUBLIC
E
F
G
H
A
B
C
D
Public
Percussion I
Percussion II
Percussion III
CHEF
VII1
Cl Mib
VC2
VC6
C1
VI13
A7
CB4
VII14
Tp1
F2
CB7
Fl.2
VI12
A3
Tb1
VII2
CB3
VI5
VC7
VII3
HB3
VI14
A10
A9
CL.CB
A1
VC8
C2
Fl1
Tb2
VI15
CB5
VII11
VI16
VII12
VI4
VII10
Tp4
VC1
A6
Tu
VII9
VC5
A2
VI11
Tb4
CB8
C4
CF
VC9
CB1
A12
VI3
HB2
VI10
VC10
VII6
F1
Tp3
VII4
A11
HB1
VII7
VII5
A4
VI2
VI9
VII13
A5
Tp2
VII8
A8
Cl.1
Tb3
VC4
C3
VI7
VI8
CB6
Picc
CB2
VI1
VC3
VI6

Figure 2 Disposition of Iannis Xenakis' *Terretektorh.*

In this context, Xenakis experiments with multiple rotations, sound fields and textures that blend with the listeners' positions. The musicologist Boris Hofmann describes the relations between the performers and audience of *Terretektorh* as follows:

> The former relationship stage-audience has been eliminated in favour of a new placement of the musicians and spectators who in fact merge with each other. So the recipient does not receive a form of presentation from one single point anymore but is simply present together with a large group of musicians who occupy the whole space. Ideally each listener is placed isolated from the other and at a special place inside the orchestra, so he indeed perceives a very special sound image, which differs from that of any other listener. This is in fact a very democratic opinion of musical presentation (Hofmann 2005: 2).

It is easy to imagine in this setting how these aural experiences (as explained in the quote above) are spatially perceived in each position. A sound line can be getting closer, further away or passing in between different listeners simultaneously; an area of the audience can be filled with loud sound while another area is in silence, the listeners from this area perceiving the sound from a distance. These sonic images are directly related to the spatial experience of the listener and they also can reveal the intention and approach of the composer.

> In the program notes he [Xenakis] speaks of certain experiences or impressions of nature […]: "the listener [...] will find himself either perched on top of a mountain in the middle of a storm [...] or in a frail barque tossing on the open sea". […] For Xenakis, it is obviously important to make the whole space of performance sound and to give the listener a direct experience of this (Hoffman 2005: 3).

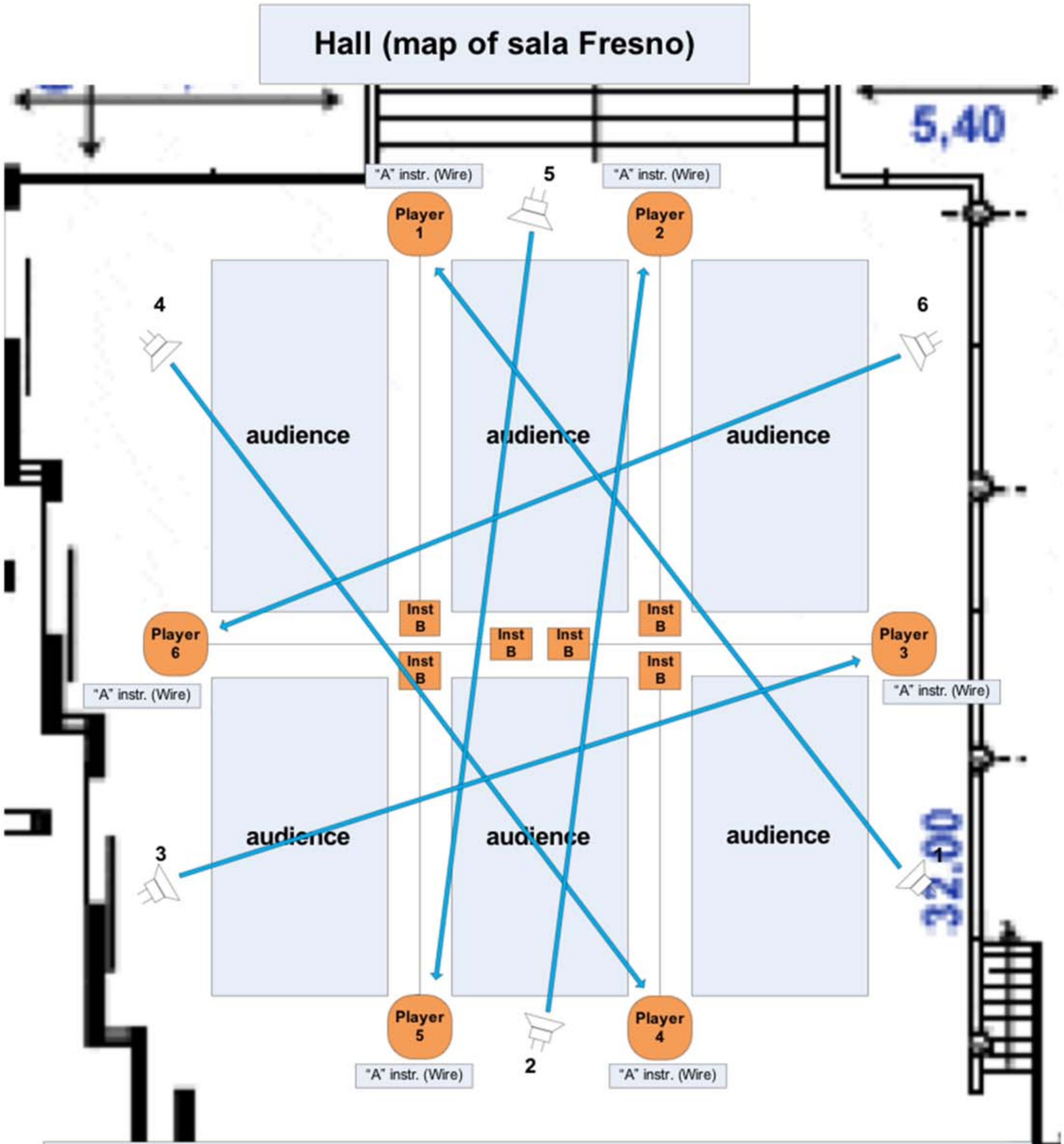
These impressions could be interpreted as Xenakis' intentions of creating an immersive experience. At the same time, this piece is conceived as an open work for the audience. In the quote above, Xenakis shows his awareness of the variety of experiences that listeners will have according to their position in the hall. As a consequence, the spatial nature of *Terretektorh* can be understood as a blending of openness and immersion. For Xenakis, this experiential approach (immersive and open) is clearly a concern, and it is reflected not only in the spatial disposition of the work but also in the material and musical processes of the piece.

In *Eufótica*, I wanted to experiment with similar issues. However, unlike in *Terretektorh* I imagined sound movements through the audience without having the sound sources as reference. How can sound move around and through the audience without performers or speakers in between the audience? How does an open and immersive concern affect the musical processes similar to that of *Terretektorh*?

Sound cannot be easily controlled to make sudden turns and swirls through the air, and it is difficult to control where and how it bounces. For this reason, my solution without using sound sources in between the members of the audience (which I will describe in the section below), is an abstract interpretation of the problem developed through compositional processes. The next sub-chapters also intend to answer the questions mentioned above.

3.3.2 Designing spatiality from a virtual perspective

The map below shows the setup of the piece as it appears in *Eufótica*'s score (see Figure 3). The position of players and speakers is defined on the map. The grey background map is from the hall where the piece was going to be premiered. I composed the piece specifically referencing that location. The text in the lower part of the figure describes the setup specifications.


Hall (map of sala Fresno)
5,40
32,00
"A" instr. (Wire)
5
"A" instr. (Wire)
Player 1
Player 2
4
6
audience
audience
audience
Inst B
Inst B
Player 6
Inst B
Inst B
Inst B
Inst B
Player 3
"A" instr. (Wire)
"A" instr. (Wire)
3
audience
audience
audience
1
Player 5
2
Player 4
"A" instr. (Wire)
"A" instr. (Wire)

1.-Each player will have an "A" instrument (wire): The wire should be amplified with a condenser microphone placed very close to the wire on the left side. The microphone stand shouldn't interrupt the bowing.

2.-The amplification should be distributed as shown in the graphic above. The number beside the speaker indicates the player that must sound through it. The arrow indicates the direction and position of the speaker. The speaker should point towards the player that is producing the sound for it.

3.-The "B" instrument should be dragged along the hallways so that space should be left open.

4.- Tape: the recorded tape is stereo. **Right channel:** should be amplified in speakers 1, 3 and 5. **Left channel:** should be amplified in speakers 2, 4 and 6. The tape must be started by percussionist number 2 or by the conductor.

Figure 3 *Eufótica's* disposition and specifications.

The arrows indicate the orientation of the loudspeakers. The loudspeakers are located across the hall pointing towards their respective performers. Each loudspeaker points towards the performer who produces the sound for it. This crossed setup is used to produce a separation between the visual and sonic gestures, creating two gestural layers. To understand this, it is important to have in mind that the acoustic dynamic level of the instrument is almost imperceptible, and the speakers close to each performer produce the amplified sound of other performers much further away in the hall. The homogenous gestural quality of the piece creates the illusion that sounds could have been performed by a specific player but the visual gestures do not match with the sounds perceived. This is an effect that is related to perception of sound underwater, where the position of the sound source is more difficult to identify.

In addition to the intention of creating a spatial sound design, the loudspeaker setup creates a visual effect that aims at blurring the correspondence between visual movement and sound. The physical movements do not correspond to the place where the amplified sound gestures come from. In the figure above, the performer's number corresponds to the number of the speaker that amplifies him/her. As earlier mentioned, each loudspeaker is placed across the hall pointing towards the player that produces the sound. Listeners receive the amplified sound of a different player from the one seen in front of them. The incongruity between the visual and the aural confronts the listener with a blurring of the listener-source correspondence. On the other hand, seeing the correspondence between sound and object allows people to perceive their actual spatial disposition. When someone can associate a sound to a visual gesture, he/she is able to recognize the source and its sound as an external separated object. By breaking this correspondence, sound is released from its visual phenomenological objectivity. In *Eufótica*, the visual movements of the players create a space where the listeners can associate the sounding environment to a kind of physicality, but not to a specific correspondence. In this way, the listeners are confronted with a situation where their habitual manner of perceiving is distorted.

It is important to consider that the non-correspondence between the seen and the heard runs the risk of being perceived as unnatural. The conventional correspondence between the seen and the heard is more habitual, and as a consequence it offers an experience which occurs from a comfortable state. In relation to this problem, Ezequiel Menalled (Argentinean composer and conductor of the Dutch ensemble Modelo62) describes the setup of *Eufótica* as interfering with his intuition:

> The first time that I heard *Eufótica* [Menalled conducted *Eufótica* in a different venue on a different occasion, MC], in Studio Loos, I was not sure whether the non-correspondence between the position of the loudspeakers and the performers was a good decision. However, I do not have a clear way of justifying this doubt. I felt a lack of naturalness in the audio-visual non-correspondence. It was an intuitive sensation. I was not able to contextualize the audio-visual effect in the sonic frame of the piece. Now I think that if the instruments are not conventional, why should the way to amplify them be conventional? However, this is a rational way of justifying

> the use of your spatial setup. In any case, the transformation of the habitual context captured my attention.[46]

In this statement I discover the conflict that rises between introjected perceptual behaviors and the perceptual incongruities of the spatial proposal. The uncomfortable feeling that Menalled experienced is related to his inability of being fully immersed in sound due to these incongruities. This also suggests that he was unable to dissociate his mental awareness from the experience. The incongruities seemed to make him too aware of his unconscious heuristic processes in a way that bothered him. However, as he stated in the last sentence, he still acknowledges his change of habit and transformation of the conventional context. This reveals that the immersion that he experienced was not into a habitual musical state, but into an immersion that relates to the context of the whole situation.

The visual correspondence between sound and physical movement also defines a spatial boundary. Sounds are identified as coming from specific sources in spite of the multiple directions from which their reflections may come.[47] Generally, an audio-visual correspondence is perceived as a certainty and offers a position of comfort from which someone is able to focus on sound. On the other hand, if the visual and the aural do not correspond, the listener experiences a spatial concern and a phenomenological illusion. The listener thus constantly poses the question "Where is this sound coming from?" The virtual and the physical borders blur into a confusing experience. This question relates to the perceptual differences of underwater listening from normal on the surface listening. This relates to Hollien's quote mentioned earlier:

> For example, Bauer and Torick *(1965)* suggest that when an individual is submerged: "Sounds appear to arrive from nowhere. The location of a friend or foe becomes a matter of dangerous conjecture and reverberant sounds mix with direct sound into an unintelligible jumble (Hollien 1973: 1288).

Where is "nowhere" if one is listening to sounds? The experience of sound always occurs in someone's body. However, the inability to locate sounds when there are visual elements as possible sound sources creates a spatial concern in the listener and a sense of vulnerability. If there are no physical visual gestures associated to the sounds, as in a loudspeaker installation where the audience is aware of the characteristics of this context, the listener naturally accepts the sounding experience as a virtual proposal that does not need to relate to the physical world around it. In this way, the listeners experience sound without needing to perceive themselves as part of the surrounding physical space. As listeners are prepared to be immersed in a self-contained sonic environment, they do not feel the need to focus on their surrounding physical space. In this case, immersion occurs as a more virtual and individual experience.

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[46] Personal interview with Ezequiel Menalled on May 16, 2014.

[47] This argument can be related to the Ventriloquist effect (described in Chapter 1).

3.3.2.1 Imaginary circular currents

Immersion through music does not need to be approached as a simulation of reality. In *Eufótica* I did not intend to simulate underwater sonic conditions. The circular currents reveal a compositional process that uses as its material real physical phenomena to design an imaginary space that is transformed in its projection towards the physical reality. The hall and the nature of sound underwater are the initial physical referents to develop this process. These physical referents are used to compose an imaginary space that resembles the physical reality. The final sonic outcome works as a new level of transformation of the imaginary space into the physical reality. The immersive characteristics of the original material are not used in order to create a simulation of sensory conditions but to create an artistic outcome which interrelates physical reality, virtuality, and aesthetic aspects.

To design my idea of currents, I imagine that the arrows on the map (Figure 3) actually represent a laser-like projection of sound without spreading out to a wider area. This is not how it physically occurs. However, through the composition I approached frequencies with reference to the duplex model of perception in air for higher and lower frequencies mentioned earlier. Higher frequencies have a higher degree of directionality that makes it easier to localize the sound source. The directionality of sound decreases gradually as frequencies become lower. For the lowest range of perceivable frequencies, sounds are perceived as coming from all directions, or as vibrations within someone's body.

As a consequence, I mostly use high frequencies to represent lines, and lower frequencies to open another layer of space. For instance, if a high frequency points towards a certain position in space, I imagine that the sound is being produced in that specific position. In other words, if the sound is pointed towards one listener I imagine that the sound is produced exactly where this listener is, not in position of the real source. If the frequency in this position gets lower, I imagine that the sound's initial position spreads out to occupy a larger area. In this imaginary setup, high frequencies work as a narrow spotlight that illuminates only the space of one person whereas as the frequencies go lower the spotlight starts to spread out, gradually revealing the space around the initial position. In the physical reality, frequency directionality works in a similar way. However in this case I propose that these phenomena occur at a distance from the real sound source, which is actually impossible. This reveals that I used the notion of frequency directionality mainly to develop my compositional ideas. I was aware that my spatial imaginations were not going to occur exactly as described.

In spite of having a higher directionality, the higher frequencies produce patterns that aurally do not correspond with the rotations designed on the map. I associate this non-correspondence with underwater sound perception. In underwater localization of sound, the perception of high frequencies is associated with bone conductivity; as a result it is more difficult to localize sounds underwater. Because of this, I imagine that the members of the audience, despite their correct physical localization of the perceived sounds, do not recognize the imaginary positions that I mapped out as correct. The correct positions belong to an imaginary space that exists within the musical process as I will describe below.

To design a swirling movement within specific areas of the audience (imaginary space), I first drew a circle over the map (see Figure 4 below). Then I connected the intersections of the loudspeakers' trajectories with the circumference of the circle and finally with straight lines forming a cyclic polygon. Then I put the angles of the polygon into alphabetical order. The length of each line of the polygon corresponds to a specific length of time. This length of time is also imaginary, as the imagined speed of sound is considerably slower than the actual speed of sound (on the map, centimeters are equivalent to seconds). As a final step in designing the circles, I used a rotation that circumambulates all the lines of the polygon starting from point A and returning to A (seen in Figure 4). Each circle is used only once in the composition.

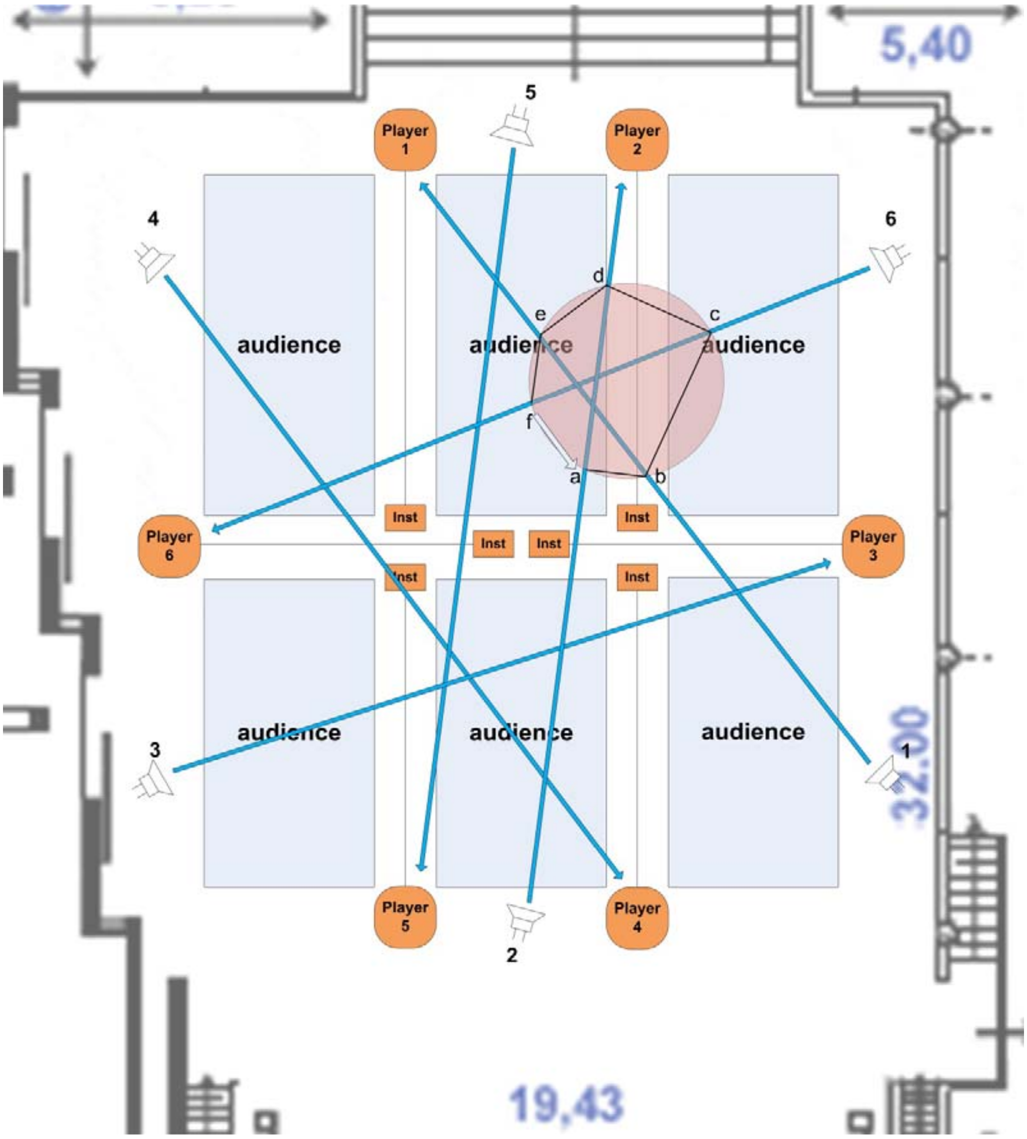
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Figure 4 Circle 1 (Polygon rotation).

Each loudspeaker is activated by its corresponding crossing point in the circle, and the sound cross-fades towards the beginning of the next letter. Each angle vertex of the polygon is marked by an accent. The polygon rotation seen in figure 5 below represents the real projection of the rhythmic, spatial and dynamic changes over time.

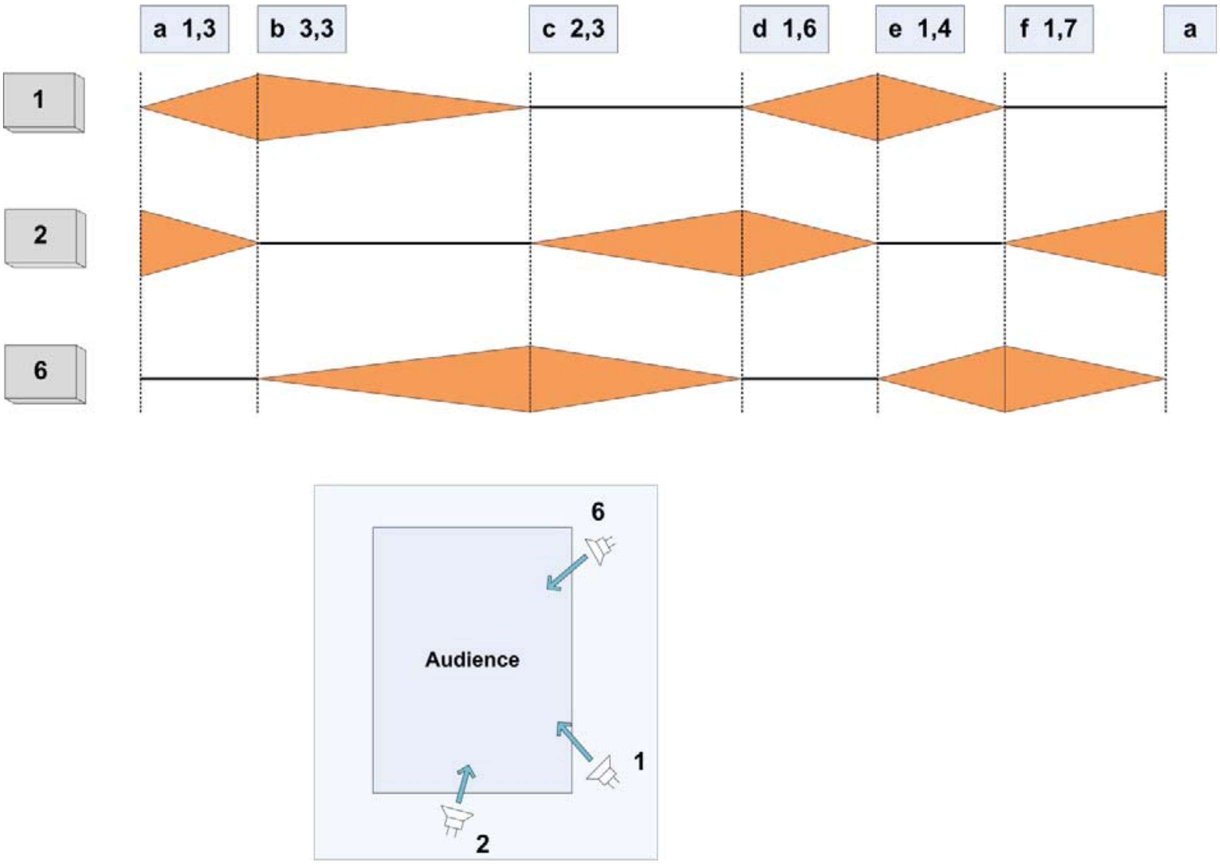

Figure 5 Rhythmic, dynamic and spatial pattern derived from Circle 1.

The figure above shows a transformed rhythmic pattern that I consider to be an external projection of the proposed inner figure (circle). The rotation of the circle as seen in the map in figure 4 is not physically perceived. The real sonic outcome is the irregular rhythmic pattern that occurs between speakers 1, 2 and 6 (red arrows in Figure 6).

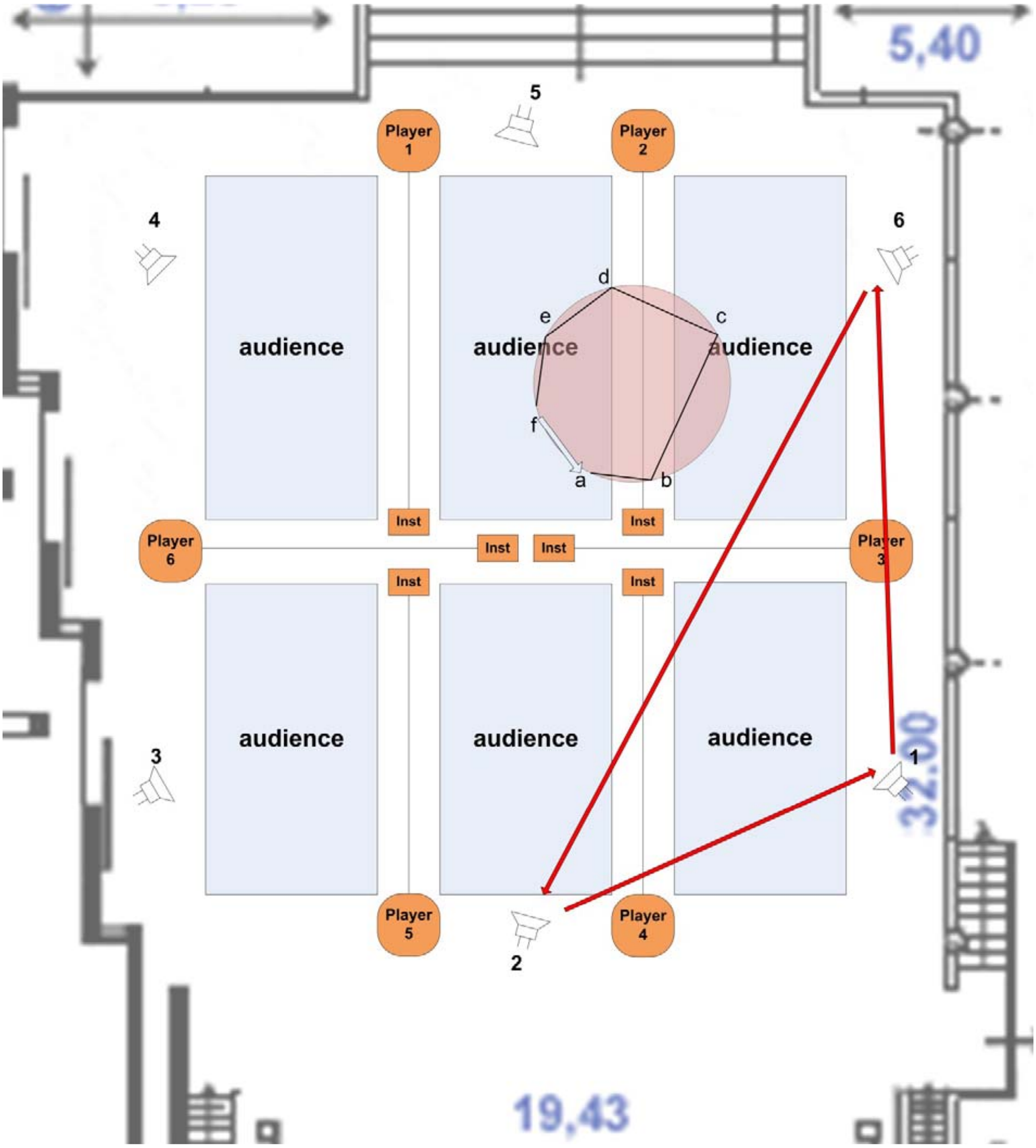
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Figure 6 Speakers participating in the rotation of Circle 1.

This reveals that the actual movement of sound does not resemble the rotation that is represented in the circle on the map. The real sounds are actually a transformed rhythmic projection of the mapped rotation (imaginary space). The resulting rhythmic patterns and the real physical movement of sound are accidentally derived from the composing process. This reveals that the spatialization is not designed by using the sound sources as a reference but from an imaginary space where the rotations are supposed to occur. I idealize that the projected rhythmic patterns transport the listeners into the imaginary space, with them taking an active role in externally projecting the sounds into their own physical area, although this will be difficult to prove. The aspect of the compositional process that interests me most is the inverted logic (the departure from an imaginary space rather than from the real sound sources) that gives form to the spatialization. In *Persephassa* and *Terretektorh* of Xenakis, the spatial design is more traditionally constructed departing from the actual sound sources. In both of Xenakis' pieces the rotations are actually perceived. From Xenakis' perspective the spatial design is directed "towards" the audience, while in *Eufótica* it is directed towards the sound sources.

In any case, the listeners perceive sounds as coming from the sound sources (musicians and speakers). This argument might lead to the conclusion that my proposals are just idealizations or an excuse to develop musical processes. However, the visual non-correspondence between the seen and the heard, described earlier, aids in blurring the perception of the real sonic spatialization. This creates a spatial uncertainty that allows the listener to diversify their spatial sensations. Considering how people perceive visual illusions like the "ventriloquist effect" suggests that the audience might relocate the perceived sounds according to what they see. In this way, it is possible to propose that in *Eufótica,* three spatial layers coexist: an imaginary spatialization related to the processes designed on the map, a real spatialization related to the projection of sound departing from the sound sources, and an illusory spatialization that results from the visual-aural incongruities. The combination of these three layers offers a different perceptual space that can be related to the special and different conditions of sound perception underwater, despite the spatial characteristics of the piece not producing an exact simulation of underwater aural conditions.

Further on in the piece, I repeated the circular rotation (described above), relocating the circle within the audience twenty three times. Each circle produces a different rhythmic and spatial pattern of different durations. Throughout this section, the circles appear in sequence but they overlap their endings and beginnings. The complete path of the circles is shown in Figure 7. The large dark arrow shows the overall direction of the path. The small white arrows indicate the initial direction of each circle's rotation. The green circle is the first rotation, and the red circle in the center of the audience's area is the last one. The path shows a resulting G shape.

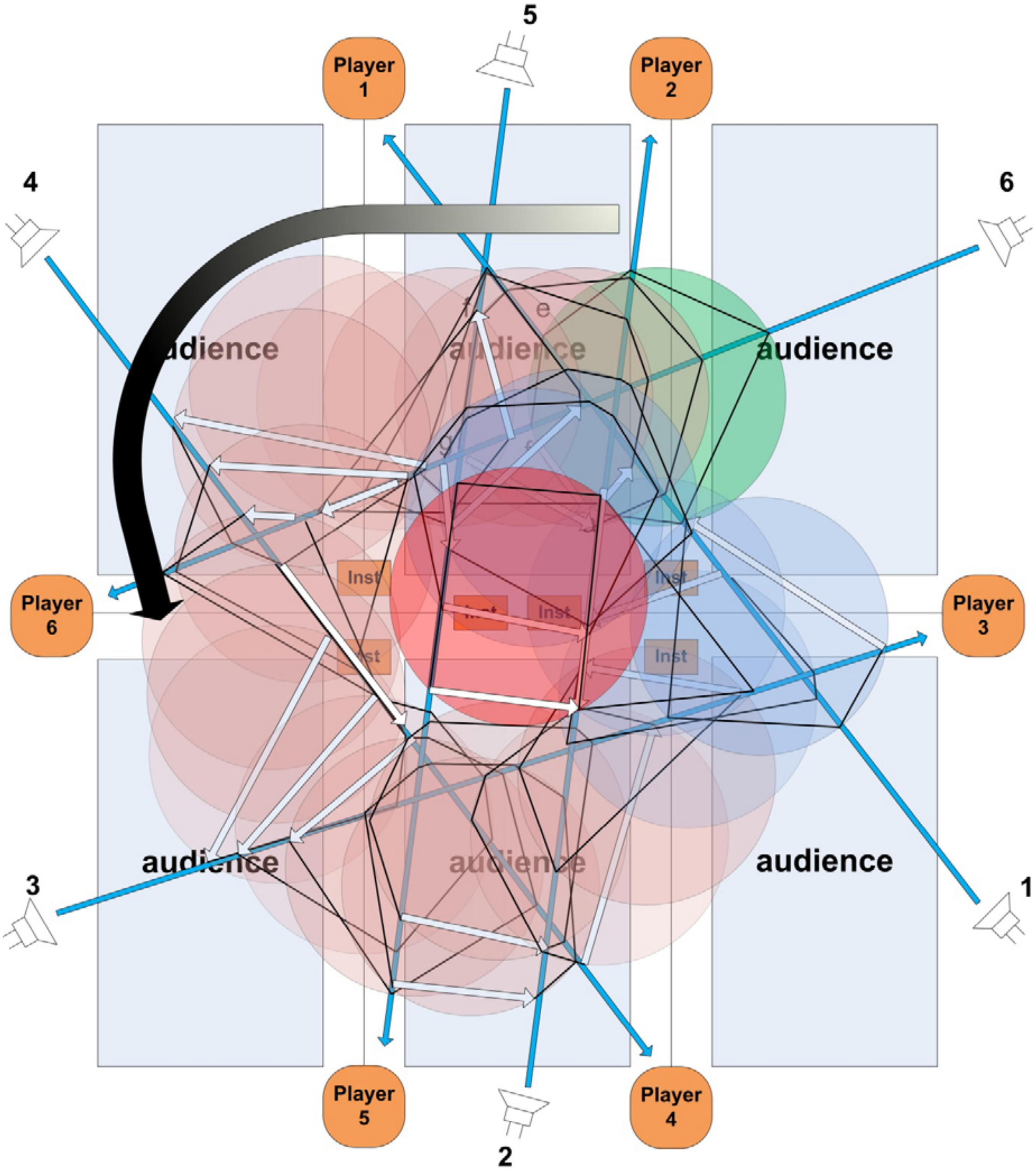
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Figure 7 Rotation path of the 23 Circles.

The larger circular path of the circles through the audience does not represent the actual spatial patterns that are heard. As mentioned before, each circle projects a different rhythmic and spatial pattern similar to the one seen in figure 5. As a result, the overall path of the circles is also not perceived as a spatial rotation. The circular path of the circles works as an imaginary process.

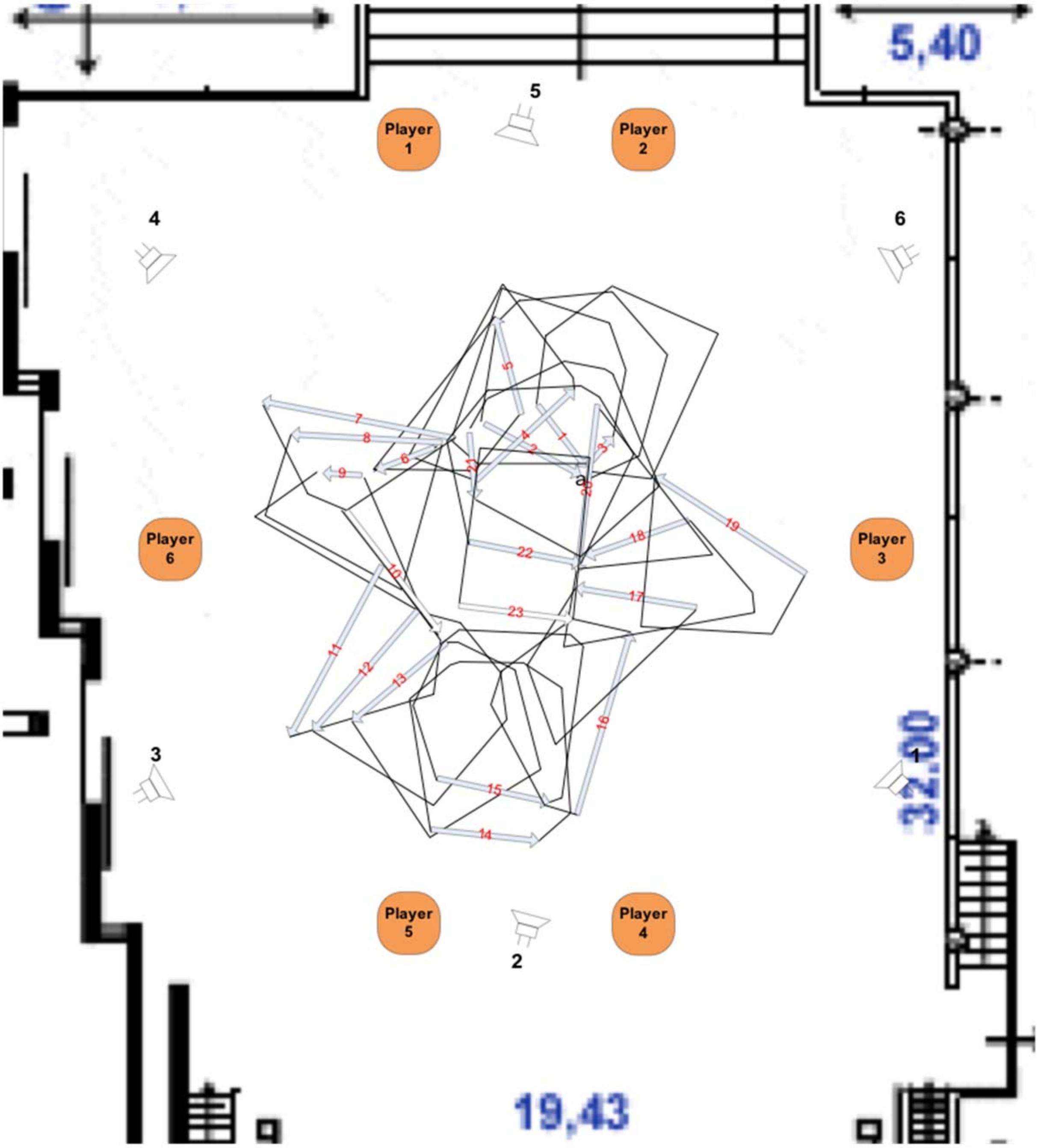
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Figure 8 Overlapped polygons resulting from the 23 Circles.

As mentioned before, the aspect of *Eufótica* that interests me most is the projection of a spatial design that departs from the audience's perspective. The figure above represents the composition of the spatial design and an imaginary movement of sound within the audience. This representation also relates to the localization of sounds underwater. As described earlier, perception of sound underwater is mediated by one's flesh and bones. This makes the listener to perceive sound as coming from, and happening within himself (earlier mentioned as “from nowhere”). From this perspective, I imagine that the resulting sonic spatialization, derived from the imaginary circles, is perceived as a projection of oneself into an externalized sonic image. Sounds underwater can be perceived as an unintelligible jumble, and as a result the sources do not clearly reveal their positions in space. This notion is mainly represented in the imaginary space of the composition. Therefore, the non-obvious relation between the musical process and the resulting actual spatialization represents the underwater jumble. Despite the fact that the sounds in *Eufótica* are perceived from specific points in space, the idea of externalization is mainly intended to produce a sense of resonance between the audience and space. The actual spatialization results from a process that is designed beginning from this intention.

Further on in the composition, when the last circle (23rd) of the first cycle of rotations reaches the center of the audience, the circumference starts to increase in size with each successive rotation of the subsequent five full rotations (second cycle of rotations, from the 24th to the 28th circle). From this point onwards, the rhythmic patterns start to slow down as the lines of the polygons get longer. From the 26th circle (3rd in the second cycle) all speakers participate in a single rotation pattern for the first time. This increase in size intends to transform and enhance the external focus of the listener. The imaginary spatial growth aims at expanding the spatial perception. Through the use of the term expansion, I imply that as the circle increases in size and reaches further out, the audience’s spatial awareness corresponds to this expansion. This expansion occurs within the imaginary characteristics of the composition. The slowing down of the movements of sound in space also has a real spatial transformation that affects the listeners’ spatial perception (explained in the paragraph below). This process again reveals that the processes of the piece belonging to the imaginary space are translated differently into the physical reality.

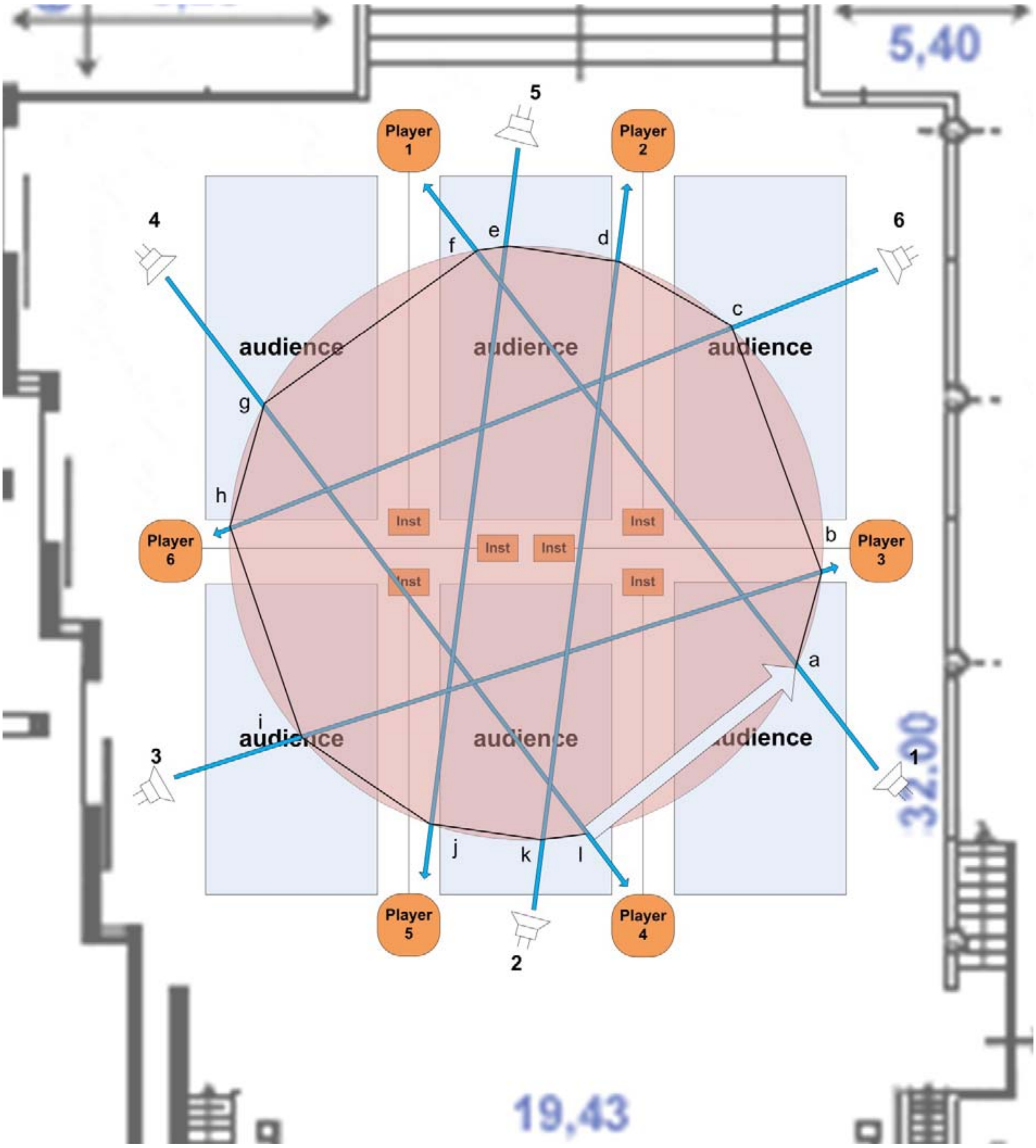
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Figure 9 Circle 28: last circle.

As seen in the last circle (Figure 9) all loudspeakers participate twice in the full rotation (both in correspondence with the placement of the sound source on the circle and its respective player). This creates for the first time a progressive pattern between speakers. This pattern intends to persuade the listeners into focusing more on the space that surrounds them. The definition of an external pattern induces the listeners to recognize characteristics that belong to the sound sources. For this reason, in this moment I imagine the listeners to perceive the sound sources as being something external to themselves for the first time in the piece (rather than the sounds locating themselves within the listener as earlier experienced). The previous smaller circles are heard more as fragmented spatial patterns that are associated with particular imaginary spatial areas. The gradual growth of the central circle (through the imaginary process) intends to make the listeners gradually perceive the sound as opening outwards. As the circle gradually grows, more speakers participate in the combined rhythmic pattern. As a consequence, there is a spatial effect in the sonic reality. As the imaginary circles get closer to the speakers, a real physical sonic surrounding occurs. This does not mean that an actual rotation is heard, but as all the speakers are constantly sounding the listeners are able to feel themselves completely surrounded by sound.

During the final circle, the electronic tape part fades in and overlaps with the last played gestures of the circle. At this point, the performers start playing crotales with a bow producing high long notes. These sounds are not amplified, so in this part the physical gestures correspond with the sonic outcome. This correspondence brings back a more conventional visual relation to the sound source. Nevertheless, the overlapped electronic sounds are not related to any of the visual events, so an extra layer of experience is added to the aural-visual comfort produced by the performers. When the electronic tape part begins, lower frequencies and louder sounds appear simultaneously from all the speakers. These sonic characteristics relate to sounds that are better localized underwater. Once again I overlap the imaginary world with the real. In this case, I overlap the imaginary underwater world, where the low frequencies are better localized, with the real surface world, where the low frequencies are harder to localize. These two worlds can be thought of as a coexisting entity where localizations occur not just "there" but also "here". From this perspective, this section of the piece represents the moment when the audience is ready to listen to themselves as being both inside and outside.

In this way, the incongruities between the imaginary and physical events, as described earlier in this chapter, work as a reflection of a resonant listening experience of the world. Listening is not an act of localizing a sound nor perceiving its separation and distance from the source. As Jean-Luc Nancy states:

> To listen is to enter that spatiality by which, at the same time, I am penetrated, for it opens up in me as well as around me, and from me as well as towards me: it opens me inside me as well as outside, and it is through such a double, quadruple, or sextuple opening that a "self" can take place (Nancy 2007: 14).

The audio/visual incongruities of *Eufótica* intend to dismantle introjected listening behaviors and to approach through experience a sense of listening like the one Nancy describes.

3.4 Openness and the impossibility of precision.

In the previous chapter, I described how in *La linea desde el Centro* the timbral reference to a guitar tradition was blurred by the use of scordaturas and continuous sound textures. In the process of composing and listening to the piece, the guitars changed their traditional role; the new sound context gradually moved my attention away from my referential expectations. I stopped listening to the guitars as guitars. The twelve guitars offered far more and diverse sonic opportunities than what I initially had imagined. I also perceived a sensational effect by acknowledging the difference between the instruments and the new overall sonic result.

The visual and physical presence of guitars invites listeners to make referential associations. In *Eufótica,* I intended to avoid this kind of referential associations by working directly with an invented instrument: a bowed metallic wire. I tied a metallic wire between two legs of a chair and started playing it with a contrabass bow. This instrument can still be related to a bowed string instrument, but this new wire-instrument has no technological sophistications. The chair is the resonance box and the tension of the wire is randomly adjusted. The wire is fixed on one leg of the chair, and on the other leg the tension can be changed by pushing a ring knot up and down. The hand grasping the ring knot always has to hold it in order to keep the tension of the wire (as seen in figure 1 at the beginning of the chapter). These qualities make it very difficult to control the pitch and the precisely indicated timbral variations. The instrument can be perceived as a physical object that produces a homogeneous metallic sound color. These characteristics can easily create a sound texture where the listening emphasis is not placed on the instrument itself but on the gestural movement of sound.

To describe this sonic nature of the instrument, I imagine a hand drawing figures in the water. The overall path of the figure can be recognized, but the contours cannot remain well defined. This analogy also refers to the conflict that appears between the well-defined musical gestures, which are precisely written in the score, and the impossibility of controlling the resulting details. Every performance of the piece presents uncontrollable timbral variations.

These characteristics correspond with those of mobile works. In the case of *Eufótica,* the resulting openness is not reflected in structural possibilities, but in the variability of sonic results that occur due to the impossibility of precision. In John Cage's words, it is a composition "which is indeterminate with respect to performance" (Cage 1999: 35) as opposed to indetermination with respect to composition. Cage refers to pieces in which material or form are clearly determined on the score, but that reveal unknown variants and indeterminate elements throughout their performance. The indeterminate nature of *Eufótica*, its impossibility of precision, contributes to Cage's argument.

To contextualize the similarities and differences between my approach and the sense of indeterminacy that Cage talks about, I compare *Eufótica* with Brian Ferneyhough's solo flute work *Cassandra's Dream Song* (1970/71). *Cassandra's Dream Song* is a mobile work that was long considered to be impossible to perform due to its instrumental complexity. Nowadays it is not considered impossible anymore as modern flute technique has developed. Nevertheless, I have chosen this piece to contextualize my argument because the issues that arose from its early performances triggered my concern on instrumental complexity and impossibility. Furthermore, I chose this work because it combines two sorts of open approaches. The first one is a more traditional approach towards an open work related to structural mobility, which is acknowledged by the performers as an active element of the work. The second approach is related to the passages that are (almost) impossible to perform, which I consider to be the musical fragments that can incite the player to have a performative open attitude. In this second case, the indeterminate mechanism is not communicated to the performers in advance but revealed and perceived through the performance.

In *Cassandra's Dream Song*, the score is composed of two big sheets. The first one presents six sequences to be read in the given order. The second sheet presents five interpolations that are to be played in any order. On the instructions page of the score appears only "These may be played in any order". The use of "may" is supposed to be giving a free choice, but this also gives the possibility to the performer to fix the piece and read the piece always in the same order. The second sheet is the one that may give mobility to the resulting form in an open way. However, there is still a chronological order to the six sequences on page one (intercalating with an open use of the sequences on the second sheet), which will always begin and end the piece. In this work, there is a very limited range of choices. These limitations impose a manner of approaching a relative freedom. This imposition will always reflect a diversity that still maintains the structural balance that the composer is aiming for. For Cage, this kind of mobility also corresponds to indeterminacy with respect to performance. However, for me it is important to differentiate between structural indeterminacy in which performers acknowledge and consciously play with the indeterminate elements, and compositions in which indeterminacy is not revealed in the score but in and through the performance. This is also the case with *Eufótica*.

A composed control over open proposals is also clear in Lutoslawski's aleatoric fragments where there are always clear instructions on how to interpret the material given. The sonic results of these fragments always have a clear musical effect in relation to the macro-form. At the same time, the musical fragments that are produced through aleatory processes resemble musical passages that are not mobile. In Lutoslawski's open fragments, such as the ones appearing in *Livre* for orchestra or his *String Quartet 1964,* there are no liberties in influencing the formal narrative of the piece.

In Ferneyhough's *Cassandra's Dream Song* there is a narrative dialogue between controlled chronology and aleatoric ordering of interpolations. As a result, there is a narrative openness and a counterpoint between the linear fragments and the interpolations. The chronological fragments of *Cassandra's Dream Song* show a clear directional path like driving on a highway to a known destination. This directionality maintains the piece on a safe track of certainty. The interpolations are like a way of stopping and getting off the highway to explore or to buy some food before getting back to the already expected track. The performer also knows at which stops to get off. He/she only has to decide their order. The path and direction which have to be taken are clear. These dialoguing attitudes are not even an obligation, as the performers are instructed that they "may" play the interpolations in any given order. The instructions do not necessarily induce the performer to have an open attitude.

The performance of this piece can also be influenced by taking into consideration the literary elements that the composer had as a reference. The story can be deduced by the structure of the piece and by relating the title to the possible literary references. The title refers to the Greek myth of Cassandra. The piece represents the conflict between Apollo and Cassandra. Apollo was infatuated with the beauty of Cassandra, and he promised her that if she gave him her love he would grant her the ability to see the future. Cassandra agreed that she would and Apollo granted her this power, but she did not keep her word. In punishment, Apollo cursed her by making no one believe her prophecies. The flute player Andrew Darlison describes his interpretation of Cassandra's story in the program notes.

> The battle between the oppressed Cassandra (represented by the powerful linear drone of page one) can be violent and aggressive but this tension is at the root of Ferneyhough's composing technique. One pole sets up the system for the generation of structure. The other pole 'cheats', disobeys the system (Darlison 2014: n.p.).

Darlison clearly relates the extra-musical literary elements to the performance practice of the piece. I question whether it should be an obligation for the performer to research literary elements that are not obviously referred to in the score to know how to perform the piece. As Darlison relates to the story, he connects the attitude of the practice with the literary elements and their meanings:

> The struggle both technically and emotionally is intense throughout the piece. This represents Cassandra's attempts to speak once again with her own voice. The piece draws energy from the struggle of the performer to come to terms with the technical demands of the piece. It contains sections which the composer himself admits are 'not literally realisable'. It is a work that moves away from perceived notions of speech resemblance in music and threatens even to replace the gesture as the critical structural element, the gestural object itself threatens to break up, being replaced with a shimmering web of energy exchange (Darlison 2014: n.p.).

It seems clear that Darlison was able to elaborate this experiential description after studying the myth and the literary references made by the composer. As he specifies in the program notes, the quote above relates to a scene of the novel *Cassandra* by Christa Wolf. This further demonstrates the importance of the literary elements for the performance practice of Ferneyhough's composition. Was it necessary for Darlison to do this research? Is it an obligation of the performer to do all of this to relate to the performance attitude that the composer expects? Or, does the performer discover this attitude by solving the problems of the score itself? It is difficult to know what the composer actually expects just by reading the instructions in the score. There are literary references made by the composer in interviews and articles that seem totally necessary to understand the meaning of the proposal, and probably some of the flute players who have performed it know of these references. This extra information might be something that is already a tradition in the performance of this piece as it is an archetypal piece of complex music. For the performers to achieve an open attitude in the performance practice of this piece, it seems necessary to be aware of these extra-musical elements. However, the score's formal and structural aspects on their own do not necessarily make the player relate to it in an open manner.

In the score, Ferneyhough does not explain clearly what he expects from the mobile structure, but he describes clearly, in his section "remarks" on the instructions page, how to approach the technical difficulty of certain passages:

> The piece as it stands is, therefore, not intended to be the plan of an 'ideal' performance. The notation does not represent the result required: it is the attempt to realize the written specifications in practice which is designed to produce the desired (but unnotatable) sound-quality.
>
> A 'beautiful', cultivated performance is not to be aimed at: some of the combinations of actions specified are in any case either not literally realizable (certain dynamic groupings) or else lead to complex, partly unpredictable results. Nevertheless, a valid realization will only result from a rigorous attempt to reproduce as many of the textural details as possible: such divergences and 'impurities' as then follow from the natural limitations of the instrument itself may be taken to be the intentions of the composer. No attempt should be made to conceal the difficulty of the music by resorting to compromises and inexactitudes designed to achieve a more 'polished' result. On the contrary, the audible (and visual) degree of difficulty is to be drawn as an integral structural element into the fabric of the composition itself (Ferneyhough 1975: n.p.)

These remarks specify the attitude needed when confronted with the addressed technical difficulties. After reading these comments, the performer's confrontation with the "pseudo-impossible" passages invites performers to discover the sonic results for themselves. In this case, performers are oriented to think that the sonic result is not an exact representation of what appears in the score. Through the instructions and complex passages, Ferneyhough intentionally directs the attention of the performer towards the non-correspondence between score and action (sonic result). Of course, this non-correspondence is common to all musical scores; there is always a friction between the visually imprint (the score) and the actual sonic outcome. However, Ferneyhough's score presents for me substantial differences with other kind of scores. The physical impossibility of the complex passages increase the perceived difference between what the performer can visually imagine and the sounds produced. As a consequence, the discovery of sound belongs to their personal ability to solve these passages. Also, the material in *Cassandra's Dream Song* invites performers to accept the possibility that the technical difficulties can lead to new results in each performance. This acceptance is related to the diversity of the sonic results, and not to a sort of laziness that might be caused due to the performers' awareness of its impossibility. Ferneyhough specifies that "a valid realization will only result from a rigorous attempt to reproduce as many of the textural details as possible".

The persuasion towards an open attitude is discovered by experiencing the behavior of the material, and not in understanding its structural logic. In this way, I perceive that the "pseudo-impossibilities" of *Cassandra's Dream Song* are what make it an open work, as they induce the performers to have an open attitude and to complete these fragments with their own solutions. On the other hand, in the free ordering of the five interpolations, the perception of openness is more restricted, as it only offers a narrative freedom, which could even be fixed. There are 120 possible permutations of these 5 units. This means that a performer can play the piece in a 120 different orders. This known number of performances is a clear frame.

When the flutists practice the passages that are almost impossible to perform they are able to perceive the differences between the music that appears in the score and the music that they are actually producing. The contrast between the fixed characteristics of the score and the differences of the sonic outcome also reveals the unique result of each performance. This makes the sonic result something of its own which is only suggested by the score, but somehow physically unlinked to it. There is an allowed imprecision framed by a clear gestural intention. This may produce a considerable amount of variations in the details of the sonic result.

The remarks on *Cassandra's Dream Song* are written as instructions. They are not suggestions. In that sense, it teaches the performer the correct attitude to have, which in practice is reflected in the open results. *Eufótica* does not include written comments on how the performer should deal with the score and its sonic result. As a comparison, in Ferneyhough's score, his comments prepare the performers to have a specific attitude. They already know that these fragments have a degree of openness. As a result, the performers discover the sonic outcome knowing that there is something uncertain. This works as a limitation for having an open aural experience through discovery. In *Eufótica,* the lack of instructional information allows the performers to directly experience the variability of the instrument through its performance.

Ferneyhough's instructions inform the performer that openness is part of the work. The openness is contained in the frame of the score. By acknowledging this, the performers can stand at a distance from the structural and sonic result. Their sense of collaboration is acknowledged, but at the same time, it allows them to approach the score comfortably as they are clearly informed of how to deal with this. This could be considered as a convention in western practice, as performers are used to follow instructions as they appear in the score. *Eufótica* describes an openness that refers to an aural discovery in which there is no separation of the work from the actions of the performer. The conventional elements of the score absorb the performer's attention as a point of focus. These elements allow them to listen to the new versions of *Eufótica* as both external sounds and as a reflection of themselves simultaneously. For Jean-Luc Nancy this is one of the characteristics that describes the phenomenon of listening:

> To sound is to vibrate in itself or by itself: it is not only, for the sonorous body, to emit a sound, but it is also to stretch out, to carry itself and be resolved into vibrations that both return it to itself and place it outside of itself (Nancy 2007: 8).

Nancy refers to this phenomenon as a rebound that describes an ontological condition. This condition is exposed in *Eufótica* due to the separation of the sonic outcome from the objective aspects of the score. This exposition appears in conflict with the introjected performative behaviors of the performers. By being aware of their resonance with the environment, performers get into contact with an unknown mode of being that differs from their more habitual and self-referential experiences.

In the process of rehearsal of *Eufótica,* some performers became frustrated through the process of learning how to play the instrument. What occurs is a frustration with the unknown. It is generally more common for musicians to use their acquired tools of knowledge to perform the proposals of a particular musical piece. In the case of *Eufótica,* they are confronted with uncertainty. This uncertainty makes each performer at a certain point to accept the way in which they play the instrument. The openness occurs through a process of accepting how one performs the instrument. This event can be related to the sense of incompleteness of open and mobile works. However, the score asks for very specific musical figures, and as a consequence in the initial approach towards the score, the performers just try to perform what is written. The openness is not visible nor explained. The incompleteness relies on the clumsy mechanism of the instrument, and the completion is reflected in the diverse and unique ways in which each of the performers confront their instrumental limitations. The personalities of the performers are exposed in this process.

The score presents itself as a conventional object that contrasts with the impossibility of being precise. This contrast works as a limitation for the performers to achieve a habitual immersive mode related to their everyday practice. In the process of learning how to play the instrument, the performers develop a sense of self-awareness that is not necessarily comfortable. However, the aspect that interests me most is that through this process they are induced to achieve a special attention towards the sonic outcome.

When performers are informed about the necessity of being open, they are able to prepare their attitude more objectively. In the case of the mobile aspects of Ferneyhough's piece, they are prepared to take random decisions. Therefore, what the performers and the listeners perceive is not necessarily open. What *Eufótica* suggests is that an "open attitude" can be triggered by the appearance of unknown elements. This directly connects to notions on immersion that describe that objectivity and critical awareness are replaced by the perception of the experience itself. The openness of *Eufótica* appears through experience and not as a presentation of the work itself as open. This sense of openness can be associated to diving experiences. During diving experiences the perceptual differences appear only gradually through experience. These differences do not present themselves in advance, explaining how to approach the new environment. The perception and understanding of the new environment gradually unfolds.

Chapter 4

On *A Bao A Qu*

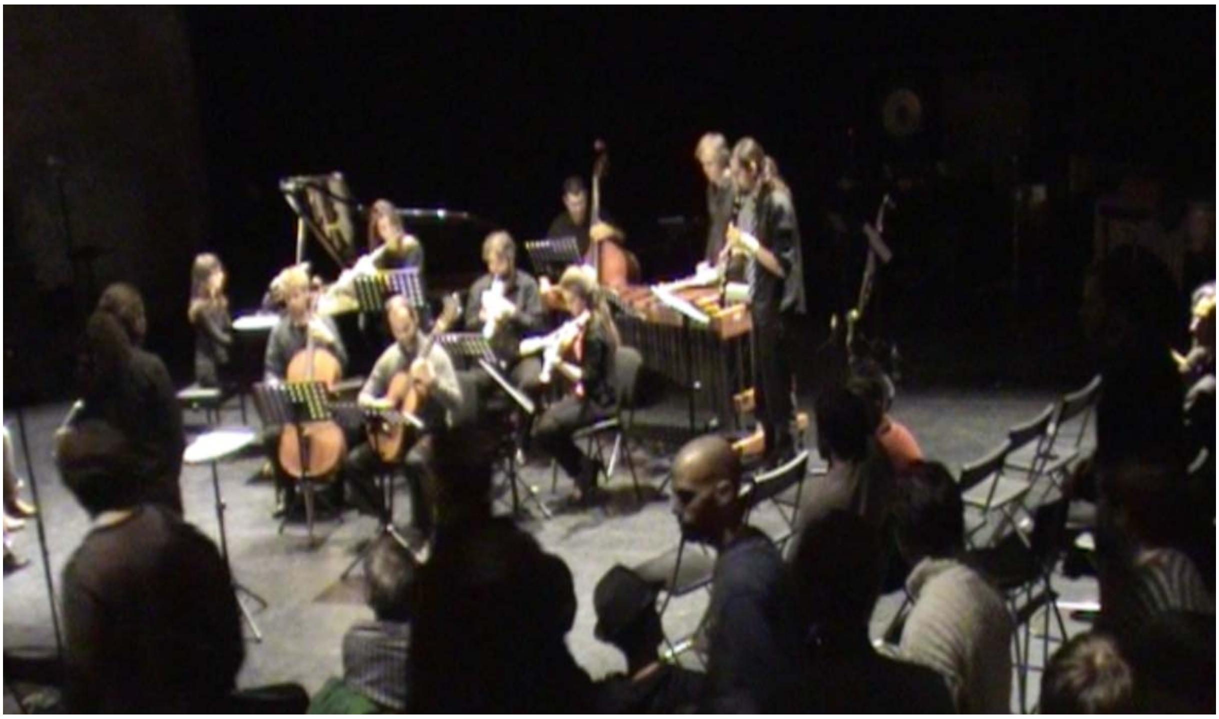

Figure 1 *A Bao A Qu*(M) (2012). Performance at Korzo Theater, The Hague, November 2, 2012. In the picture, the audience can be seen entering the hall while the performers are already playing. *A Bao A Qu*(M) was commissioned by the Dutch ensemble *Modelo62* for the program "Stranger Than Fiction" performed at Korzo Theater on November 2nd, 2012. In this program, the ensemble intended to break the conventional settings of a traditional concert space, having as a main question: what separates fiction from reality?

4.1 Introduction

> On the stairway of the Tower of Victory there has lived since the beginning of time a being sensitive to the many shades of the human soul and known as the A Bao A Qu. It lies dormant, for the most part on the first step, until at the approach of a person some secret life is touched off in it, and deep within the creature an inner light begins to glow. At the same time, its body and almost translucent skin begin to stir. But only when someone starts up the spiraling stairs is the A Bao A Qu brought to consciousness, and then it sticks close to the visitor's heels, keeping to the outside of the turning steps, where they are most worn by the generations of pilgrims. At each level the creature's color becomes more intense, its shape approaches perfection, and the bluish light it gives off is more brilliant. But it achieves its ultimate form only at the topmost step, when the climber is a person who has attained Nirvana and whose acts cast no shadows. Otherwise, the A Bao A Qu hangs back before reaching the top, as if paralyzed, its body incomplete, its blue growing paler, and its glow hesitant. The creature suffers when it cannot come to completion, and its moan is a barely audible sound, something like the rustling of silk. Its span of life is brief, since as soon as the traveler climbs down, the A Bao A Qu wheels and tumbles to the first steps, where, worn out and almost shapeless, it waits for the next visitor [48] (Borges 2002: 15).

The A Bao A Qu is an imaginary being whose development and awakening depend on the presence and spiritual evolution of the visitor. For this reason, the A Bao A Qu can be thought of as an extension of the visitor more than just as an individual being. The creature A Bao A Qu can also represent the resonance of the visitor’s self as an external manifestation. In Borges’ narration, it is not clear if the visitor is able to watch or see the creature. The imaginary being appears to be a sort of luminous entity that follows the visitor as if it is the visitor’s shadow. However, in this case the shadow produces light instead of a darkened form. Commonly, a shadow obscures a portion of our external reality, projecting a transformed contour of our body. This phenomenon can lead to the perception of an enhanced and separated self-awareness as a result of the external reality being covered by shadowy blurred images. In this sense, I observe dark shadows as boundary definitions. On the other hand, the luminous “shadow” of the A Bao A Qu illuminates the external world, projecting our own diverse personal capabilities. In an A Bao A Qu-kind of experience, our diverse aesthetic and emotional responses, mediated by an aesthetic proposal (such as a musical performance), transform and enhance our perception of reality.

In the *A Bao A Qu* story, the development of the creature represents a gradual transition from a normal conscious mode towards a transformed perceptual state. Transformation in this case refers to an opening more than to an augmentation or a quantitative perceptual improvement. The “spiritual potential” already exists within the visitors. The A Bao A Qu presents a manifestation of that spiritual potential, it doesn’t have an ability to grow on its own. The visitors are responsible for the level of development of the creature. The spiritual potential of the visitor is released during the ascending process and displayed in the creature. By correlating the spiritual potential in the *A Bao A Qu* story with an aesthetic potential in *A Bao A Qu*(M)[49], the transition in *A Bao A Qu*(M) represents an immersive process that is conditioned by the ability of the listeners (as representing visitors to the tower) to interact with an aesthetic presence. This conditioned interaction can be related to the experience of any artistic event. However, the A Bao A Qu does not show itself suddenly, but develops gradually without establishing a clear point of origin. It is common to recognize spatial and temporal borders in art works. On the other hand, the A Bao A Qu has no beginning. An A Bao A Qu-kind of experience does not occur as the appreciation or conscious acknowledgement of an aesthetic event external to reality, but as a continuous process of perceptual and aesthetic transformation of reality.

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[48] Fragment of *A Bao A Qu* from *The Book Of Imaginary Beings*

The process of the A Bao A Qu can also be compared to the phenomenological description of mirrors in Chapter 1 "On *What About Woof?*". When perceiving one's reflection in a mirror, one first experiences the phenomenon of the reflection before recognizing the mirror as an object. The reflected image can only occur in the presence of the one who is observing. The existence of that reflection will always depend on its external referent. In the same way, the A Bao A Qu takes form and can only exist as an interaction with its referent. While climbing the stairway of the tower, the manifestation of the A Bao A Qu (as described in the narration) does not appear as a frontal nor a confrontational experience as it happens when one looks at oneself in a mirror. The creature is progressively released from within the visitor, gradually appearing as an external manifestation of the visitor's spiritual development while simultaneously blending with the surrounding environment. This process describes a continuous transformation where experiential borders are not clearly defined.

In my composition, I observe these characteristics of the A Bao A Qu as a metaphor of the concert experience. Instead of taking into consideration the potential spiritual evolution of the visitor, I imagine that each listener has a potential for aesthetic experience. This potential can be understood as the relative ability that each listener has to emotionally and aesthetically relate to the artistic stimuli. The way in which aesthetic events are perceived is always conditioned by the specific and varied forms of interaction that arise from each listener. The personal history and cultural experience of each listener produces an uncountable variety of perceptual responses.

From this perspective, musical experiences can always be thought of as a form of self reflection, the music being reflected through the listener. Music listening can be compared to the experience of the visitors that awake the A Bao A Qu. However, musical works are generally still perceived as separated and self-contained entities. This can be compared to one's ability to think of the reflection in the mirror as an other. As mentioned in Chapter 1, we are able to separate and identify the reflected image of ourselves as a representation. Despite the possibility of consciously separating the musical work from the experience, listeners cannot escape their referentiality. The dependence between the reflection and its physical referent (human observer) elucidates a state of plural resonance where one is only able to "think" of oneself individually, but where one can only "experience" phenomena in coexistence.

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[49] As I already wrote in the Introduction, I will refer to my piece as *A Bao A Qu*(M) to differentiate it with the A Bao A Qu from the story. The M thus stands for music.

Although experiential coexistence can be thought of as a human trait that is a *sine qua non*, it is common and habitual to assign a "false objectivity" to aural events. When listening to music, we experience a simultaneous interaction between an artistic stimulus, ourselves, and an environment (social and physical). However, we are able to identify the aural events of a musical work as belonging to a self-contained work of art and as a consequence of this identification we can think of ourselves as receivers who are separated from that aural event. We can assign the responsibility of our sensory experience to an external object; "the work" is that which makes us experience something. It is common to give names to sounds, motifs, musical pieces, and to speak about them as independent objects which are separated from our experience. Jorge Luis Borges comments in *A History of Eternity* that "(…) we all do Nominalism *sans le savoir*: it is like a general premise of our thought, an acquired axiom" (Borges 1953: 10). Borges refers to Nominalism as a form of assigning concrete meaning to the objects and events that we perceive. In this way, these objects and events can be seen as having an individual and particular existence. He suggests that Nominalism introjects in our way of relating and thinking about the world; it is a cultural habit. By tagging objects and events with a name, we persuade ourselves to have this Nominalist perception of the world where objects and events are seen as particular self-contained beings. When I give a name to a musical work, I inevitably fall into the same axiomatic behavior that Borges' refers to. Moreover, the conventions and habits within the concert context persuade the listeners to perceive the musical work as a framed object. The conventions – e.g. the dichotomy between public and stage, the clear temporal frame of each piece, the clapping, the almost compulsory and deeply internalized ritual – interfere with the natural experience of resonance. In *Heidegger: an introduction*, the philosopher Richard Polt comments on Heidegeger's criticism towards this problem:

> (…) we normally take our inherited interpretations as self-evident. We assume that our own way of acting and thinking is the only way, and we suppress the fact that it has historical origins. In this way, the past gets petrified into a 'tradition' in the narrow sense: a rigid, unquestioned conceptual structure (Polt 1999: 37-38).

The quote above poses a phenomenological problem: our introjected habits restrict our ability to perceive the world beyond the frame of these acquired and established significations. This creates a separation and confrontation between what we "already know" and what we perceive. Generally, we experience this "tradition in the narrow sense" as our reality. As a consequence, it does not appear to us as a limitation or problem to experience the world. Our habitual understanding of reality exists as an independent layer of experiencing the world that can be thought of as separated from our sensorial reality.

> We typically set up a dichotomy that Heidegger combats throughout his writings: we oppose the way things show themselves to the way things really are in themselves – we treat appearance and reality as radical opposites (Polt 1999: 38).

What remains, are our individual experiences of reality. "What things really are in themselves" refers to an authentic sensory experience. For Heidegger, Being is not the entity in itself, but Being is the sense that reveals the entity's open relation with the world. Further on, he argues that: "…the Being of the entity is found only in encounter" (Heidegger 1992: 217). This notion prepares Nancy's argument that existence can only be experienced in coexistence. In this way, perceiving “what things really are” can be understood as a “being-with”. “Appearance” in Polt’s quote above refers to the subjective objectivity that is constructed by associating seeing and being as stated by Frances Dyson (quoted earlier in Chapter 1, page 22).[50] The abstracted objectivity assigned to that which we see is also related to the notion of Nominalism described above. The objectification that results from appearance is an obstacle in the perception of being as a shared experience. It is simple to formulate and think: “I am here” and “that is there”. However, through the experience of an artistic event, the subjective characteristics of art tend to subvert this dichotomy. Despite this, it is essential to acknowledge that the dichotomy described by Polt is a deeply introjected trait that affects our sensorial and psychological experiences.

How is it possible to transform this dichotomy present in the concert context in my piece *A Bao A Qu*(M)? Does it already contradict itself by having a name? It is not possible to avoid that the piece has a kind of particular identity. The experience is associated with the composer’s name and the name of the piece. Some kind of characteristic sonic outcome is expected.

In *A Bao A Qu*(M), as in *Eufotica,* these questions persuaded me to start focusing on convention as a departure point, more so than complete originality. In this chapter, I will describe how new sonic and spatial approaches came out from the transformation of the performative and concert context conventions.

4.2 Entering the space: Immersion as transition

In *A Bao A Qu*(M), I avoided the presentation of a clear beginning. The musicians start playing at an almost imperceptible dynamic level a minute before the doors of the hall are opened for the audience to come inside. When the audience starts entering the hall, the performers are already in a performative mode and the almost inaudible music is already softly resonating in the space. The sounds of the musicians, the hall, the people speaking, their movement, and the sounds from outside the hall blend into a homogeneous sonic texture of heterogeneous content.

The process of entering the space works as an analogy to Borges’ narration. The musical presence is active but in a dormant state that is represented in the soft dynamic level. The music starts developing as the audience comes in. This process also resembles submersion into water. Fluid environments are already present and available before we decide to enter into them. The presence of air and water appear in coexistence. Submersion and emersion are experienced as transitions between coexisting environments that are always available. When the door of the hall is opened, the musical texture comes out of the hall blending with the external space. This sonic blending can be imagined as the experience of standing in front of the sea or when being close to any body of water that has a clear sonic presence. The fluid environment already resonates in the air. We are able to listen to its presence.

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[50] This association “has been fundamental to the construction of a subjectivity where the eye and I coincide—where vision, abstracted, becomes the ground for all objectivity, certainty, and inspiration” (Dyson 2009: 13).

In this way, *A Bao A Qu*(M) intends to give the sensation that its aesthetic presence is always available. This availability can be perceived as a result of the continuous overlapping and transitioning between virtual and concrete spaces. The act of approaching the sea can only be experienced as a transition and not as a framed event. If one walks towards the sea from inland, the sounds and presence of the sea gradually start to appear. Then we have the possibility of voluntarily submerging into the water. As we emerge and later walk away from the sea, we again experience a gradual perceptual transition. These notions refer to immersion as a continuous transformation, and not as a dissociative or framed event. The immersive environment exists as a continuous presence.

The idea of continuous presence can be related to John Cage's work *Organ^2/ASLSP* (As SLow aS Possible) from 1987. As the title says, the instructions for this organ work suggest it to be played "as slow as possible". On September 5th 2001, a performance of the piece was started at the St. Buchardi church in Halberstadt (Germany) and was decided to be played for 639 years. It is possible to visit the church, or to listen to it online on the website of the project (http://www.aslsp.org/), which will be active until the end of the performance, if the internet still exists by then. In this performance, the listeners still acknowledge the frame of the work. There is a clear beginning and an expected ending. The question of a perceived eternity relies on the fact that none of the listeners who are and will be aware of this performance will be alive to listen to its end. As a consequence, listeners will experience the work as an eternity in relation to their lifetime.

The temporal dimension of the performance at St. Buchardi also opens up a notion of sharing. It is a performance that cannot be heard individually in its totality. The piece presents itself as a work that will be shared across generations. As a consequence, the sense of an individual experience that can be perceived from a "complete" musical event is made impossible in the 639-year version of *ASLSP*. This performance of *ASLSP* reflects coexistence and plurality through time. However, this sense of sharing only appears as a result of knowing about the length of the performance and not from one's sensorial relation to the work itself. Therefore, this work offers the possibility for one to perceive a sharing of its aesthetical qualities through this meaning (knowing the temporal characteristics of the work). This can be related to one of the main arguments of Nancy's being singular plural:

> There is no meaning if meaning is not shared, and not because there would be an ultimate signification that all beings have in common, but because meaning is itself the sharing of being. Meaning begins where presence is not pure presence but where presence comes apart [*se disjoint*] in order to be itself *as* such. This "as" presupposes the distancing, spacing and division of presence (Nancy 2000: 2).

According to Nancy's argument, every attribution of meaning reveals coexistence. In the case of Cage's performance, the meaning is represented in its temporal exposition. The performance of *ASLSP* at St. Buchardi is not so much perceived as a shared meaning, but rather as an elaborated musical representation of Nancy's argumentation. Very often, pieces by John Cage are considered in this conceptual framework. When we know about the conceptual ideas behind a musical work our psychological and sensorial experiences are conditioned. From this perspective, the experience of *ASLSP* can be understood as built on the understanding of its meaning more than on its sensorial characteristics. The aesthetic experience is enhanced by the recognition of the temporal dimensions and frames of the piece. As a consequence, the performance is first understood as a framed work.

The recognition of Cage's *ASLSP* as a work of art that is extended to an amount of time that surpasses our life span suggests a Platonic sense of eternity. In *Timaeus*, Plato thinks of eternity as an archetype where past, present, and future exist simultaneously. For Plato, "time is a mobile image of eternity" (Borges 1953: 3). From Plato's perspective, eternity is static while time represents the movement within eternity. This notion suggests that something that it is objectively recognizable and always available is timeless in spite of being built within the notion of time. This can be perceived as a universal notion or as an archetype. Cage's piece might be understood as a temporary reflection of the archetype of eternity. The long performance of *ASLSP* becomes for us an archetype in the way that we are informed of its boundaries and we recognize its presence as a finite line spread out through time. As a result, we are able to perceive the work as a closed entity. When informed of the temporal characteristics of the performance, the listeners are confronted with the fact that the event will exceed their lifespan, but presents itself as finite. As a result, the supposed perceived continuity of the piece contradicts with the motionless theoretical understanding of the piece. We can acknowledge that the work is a work, but we cannot experience its totality. This implies an experiential impossibility which imposes and exposes a distancing between the work and its experience. This distancing can be related to any form of recognition and objectification.

How is it possible to dis-objectify a work of art? It is almost impossible to not perceive an artistic event with a certain degree of phenomenological objectivity that reminds us of the work as a self-contained particular identity. Conventions and habits are bonded to one's recognition of art as art. As mentioned in the introduction, the name of the piece, composer, venue or hall will psychologically establish the presence of some sort of nominal identity. This kind of framing creates an identity regarded as a system of in – and exclusion. The cultural conventions and their psychological effects are always present. For this reason, the dis-objectification of a work can only be approached as a result of a sensorial experience. As a result, my focus as a composer points towards rethinking sonic, visual and spatial conventions and avoiding conceptualizations in order to aid a new way of perceiving the musical contexts.

In *A Bao A Qu*(M), the audience is not informed about my intention of creating an experiential continuity. [51] The continuous presence results from the transitional characteristics of the music and a lack of clear borders. While the long performance of Cage informs and openly exposes the question of time through a clearly framed composition, *A Bao A Qu*(M) intends to create its effect through a musical experience that gives a sense of continuous presence. In this way, after the performance of *A Bao A Qu*(M), listeners do not necessarily think that the work is continuing. At the same time, they neither can clearly identify its sonic borders. This does not mean that the piece will not be remembered as a framed event, but it may leave an unconscious aesthetic echo or the sense that whatever was experienced is still in motion and in transformation. Therefore, I am cautious to provide listeners with too much information about the intentions of the work before they experience the musical performance. Too much information may condition the kind of attention that the audience gives to the music. The piece is left open for a multiplicity of interpretations and perceptions.[52]

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[51] To not inform the audience about the intentions of the composer or of the conceptual thoughts behind the piece is something common. However, I consider necessary to mention this to differentiate this common uninformed approach with an informed case as the one of Cage's *ASLSP*.

From this perspective, immersion is approached as a continuation of reality and not as a detachment from one reality into a different or new reality. As argued by Nancy, art works expose the plural disposition of the world. The dissociative nature of many immersive technologies and art makes Nancy's argument appear as a theoretical idealization. In virtual media, "full-immersion" refers to a fully self-sustained and separated experiential space. The term immersion in relation to the development of technology and media mostly emphasizes the experience of a self-sustained virtual space. In an artistic context, it is important to take into account notions such as those of Nancy's to rethink immersion, not as a dissociation from reality, but as an experiential exposition to coexistence.

4.3 Polytemporality and communication

One of the most common and traditional characteristics of ensemble music is that the musicians share the tempo that the conductor indicates. This can be seen as a feature of classical tradition. Polytemporality exists in compositions that share a same reference tempo. Already in vocal polyphonic renaissance music, it is possible to listen to ternary tempi against binary beats. The level of polytemporal complexity with a shared reference beat increased and developed in compositions of the 20th century. In these cases, the figure of the conductor represents an intercommunicating and unifying element. It is also important to consider 20th-century pieces composed with different simultaneous tempi. The polytemporal feature of these works cannot be considered as a tradition, but as a feature or collection of particular cases.

For *A Bao A Qu*(M), I focus on traditional and conventional elements for developing the musical material. The polytemporal nature of my composition is not the result of an intentional originality or of a purely musical idea, but the result of a reflection that came out of observing conventional elements. In this case, the traditional element that was observed and transformed through the piece is the shared common tempo between the conductor and performers. I will refer to this common tempo as *synchronicity*.

Polytemporality can produce diverse sonic results. In the case of my piece, I was interested in generating a homogeneous and nervous texture. My main focuses were the sonic effects that may result from a total miscommunication between the conductor and players, and the transformation that may occur by gradually increasing the levels of communication and *synchronicity*. In this way, the sonic texture serves as a common resonant space from which listeners and performers are able to move their attention towards diverse and multiple experiential layers. I idealize that the audience will perceive similar sonic results in different ways if the attitude of the performers has a different focus. This notion aims at achieving a sense of openness where the musicians and audience share a sonic space that is more related to sensorial and emotional responses. The idea is to avoid a musical result that is experienced through structural and formal associations.

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[52] If the piece is performed more than once, I imagine that the later performances appear as a continuation of the previous version staying open for the listeners' musical experience.

As already mentioned, all musicians play in their own individual tempi for almost the whole piece. The process of the piece develops towards an increasing synchronicity between players as well as between the players and the conductor. Synchronization and communication are analog; as the synchronization gradually increases, the communication between the musicians increases as well. The initial individuality of the performers is intended to mirror the experience of the audience. The listeners enter with their individual expectations, and as the work evolves and increases in synchronicity, they start to be part of a shared and interconnected space. My experiential goal is that as the communication between the performers and the conductor increases, the listeners gradually perceive themselves more involved and becoming more a part of a shared experience. In the following subchapter I will describe the way in which I composed this increasing synchronicity to contextualize the notions presented here.

4.3.1 Communication steps

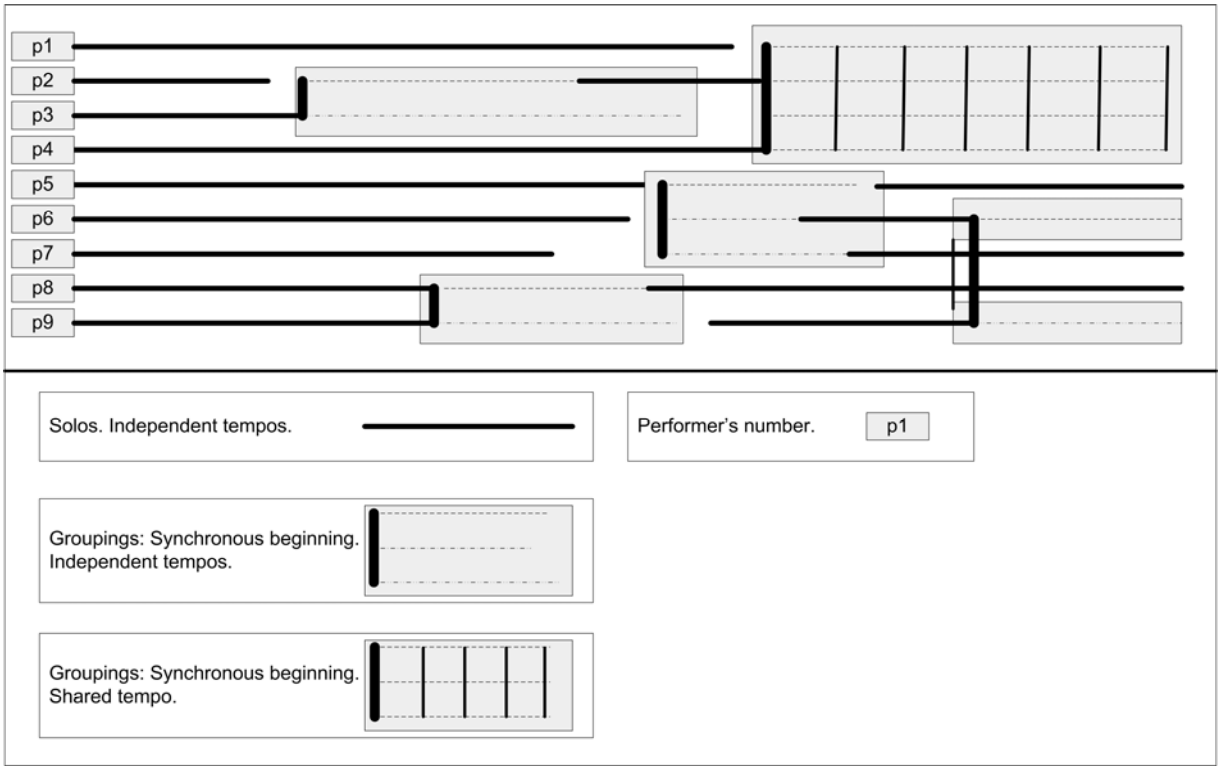
p1
p2
p3
p4
p5
p6
p7
p8
p9
Solos. Independent tempos.
Performer's number.
p1
Groupings: Synchronous beginning. Independent tempos.
Groupings: Synchronous beginning. Shared tempo.

Figure 2 This graphic illustrates the order of appearance of the diverse communicational steps.

4.3.1.1 Singularities within a plural context

In the beginning of the piece, all the performers play their solos simultaneously (Figure 2: bold lines). Each solo has its own particular tempo. In this stage, the musical texture is nervous and homogeneous This homogeneous sonic outcome results from multiple individualities, in other words, from a heterogeneity as well as from the uniform dynamic level and the continuous character of the instrumental parts. Each player focuses on his/her own individual part. The performers do not need to know what other musicians are playing. The only instruction that connects the performers is the necessity for keeping the dynamic level of the whole group as soft as possible. This also functions as a controlled aspect of how the performers listen to the surrounding music. A controlled way of listening occurs more generally in musical works where the performers already know the sonic result. In the case of this section of *A Bao A Qu*(M), the controlled aural focus of the group is mainly concentrated on the dynamic aspect. On the other hand, the irregularity and continuous transformation of timbral, harmonic and rhythmic elements within the sonic texture allow the performers to listen from the perspective of the audience. In addition to this, the different tempi and diverse starting points of the individual lines create different overlaps in every performance. The performers cannot memorize specific segments of the texture. As a consequence, the audience and the performers share the curiosity for the unknown aspects of the sonic outcome. The mobile mechanism at the beginning of the piece transforms the performers' more traditional focus towards the score to a different aural experience. The sonic outcome does not correspond to the meticulously notated score, that is, to the pitch-based music seen in the score. This non-correspondence occurs as a result of the special instructions given to the performers on how to read the score. Each performer represents a singular identity that participates in a plural context. This results in a different form of belonging where individuality is projected into a shared sonic environment. The sharing of that space transforms the isolated sense of individuality into multiple and shared singularities. Jean-Luc Nancy describes singularity as different from individuality:

> At this point, one becomes most aware of the essence of singularity: it is not individuality; it is, each time, the punctuality of a "with" that establishes a certain origin of meaning and connects it to an infinity of other possible origins. Therefore, it is, at one and the same time, infra-/intraindividual and transindividual, and always the two together. The individual is an intersection of singularities, the discrete exposition of their simultaneity, an exposition that is both discrete and transitory (Nancy 2000: 85).

From this perspective, it is possible to understand that acknowledging individuality is an exposition of plurality. The sonic result of the intermingled singularities in the beginning of *A Bao A Qu*(M) can be understood as a sonic being-with, as an experiential exposition of being singular-plural through sound.

In a traditional musical score, where the tempo is shared by the conductor and performers, the role of each participant is more functional to the needs of the structure. This can be seen as a more passive form of belonging. Each player is part of the whole, but, in my opinion, their individual identities are less relevant for the completion of the sonic result. In *A Bao A Qu*(M) the score instructions encourage the performers to find individual solutions.

This means that if one performer of *A Bao A Qu*(M) is replaced the overall sonic outcome will substantially change at timbral and formal levels. As described above in *A Bao A Qu*(M), the musical texture results from the overlap of singular identities. With this, I intend to musically create a space that is experienced as being singular-plural. Nancy describes listening and the sense of being singular-plural as an ontological condition which is a *sine qua non*. Nevertheless, the frames and traditions of musical practice describe a more segregated and evident separation between music and audience, between a piece of art and its physical surroundings or between the score and the performer. The addition of the diverse singularities that occurs in *A Bao A Qu*(M) intends to redefine these conventional automatisms through the musical experience. Through this, I intend to differentiate a work such as Cage's *ASLSP*, where the acknowledgment of the work's characteristics conditions the listeners' and performers' way of perceiving it, from a kind of work which hides its conditioning conceptual connotations, therefore offering a less psychologically conditioned sensorial experience.

4.3.1.2 Groupings

As the solos of the beginning continue (creating a flowing sonic texture), the conductor starts cueing the entrances of duets, trios or quartets that overlap with this ongoing texture.

A. Synchronous beginning of a grouping where all the players have individual tempos (As seen in Figure 2, each player is shown with different kinds of dashed lines. Each line represents a different tempo).

The conductor only cues the entrances of the musical fragments. I composed these groups as independent musical segments. Each player within a group plays a different tempo from the others. The music composed for each grouping has its own particular contrapuntal relations. This differs from the musical texture that results from the solos heard earlier in the work where I do not control the counterpoint of the outcome. These groups can be metaphorically compared to small groups of people talking about the same subject with the individuals of the group still keeping their own singular identities. In this case, the singular identity is associated with an individual tempo. On the other hand, the overlapping solos from the beginning can be seen as a mass of people where each member expresses its own singularity without necessarily sharing the same subject.

The groupings start to approach a more traditional ensemble behavior. However, it is still difficult to recognize the unified musical character of each group, as these fragments appear overlapping with other groups and with the solos (Figure 2). Moreover, each player within a group ends at a different point in time. A player of a group can stop, pass to another group, or begin a solo before the fragment ends (Figure 2). As a result, these fragments might have asynchronous endings. The endings of each group can be perceived as transitions towards the overall musical texture and not as closed musical fragments. These transitions represent continuous layers of immersion. Each group appears as a growing wave that dissolves into the overall texture. This can be compared to a figure that approaches from underwater and we are almost able to identify its form but it never reaches the surface, so we never recognize its complete form. So the groups never completely reveal their identity.

The musical fragments of the groups do not show themselves as closed, but as boundless fragments. This characteristic maintains the immersive process as a continuous flow, and does not reveal the music as an objective or virtual space separated from the experiential reality.

B. Synchronous beginning of a grouping where all of the players share the same tempo (these groups are shown with connecting bar lines in Figure 2).

In these fragments, the conductor marks the corresponding bars for a specific group. When these groups appear, the audience and the performers can see for the first time a traditional way of marking beats. As a consequence, a familiar element is strongly amplified through a visual relation (the conductor's gestures). However, this relation appears as an illusion with respect to the overall sonic outcome due to the overlapping of asynchronous groups and solos. These overlappings do not correspond with the visual objectivity created by the conductor marking specific beats. The synchronic groupings appear as an objectivity that contrasts with the rhythmic diversity of the sonic texture. The aural-visual interaction allows the audience to perceive (or imagine) different sonic layers. The familiar image of the conductor marking beats emphasizes the presence of the other, non-conventional elements, and accentuate the multiple sonic fields. I use the word "field" to deconstruct the distinction between the more traditional use of foreground and background. The acknowledged visual objectivity that could be associated with a specific group does not transform the rest of the layers into a background. The acknowledged visual familiarity appears as a point of focus that interacts with other fields in a resonant manner.[53] The visual familiarity amplifies the perception of other experiential layers and of our contextual environment.

4.3.1.3 Full ensemble synchronicity

A. Synchronic attacks / individual tempi

The conductor cues the entrances for the whole group. Each player has her/his own individual tempo. These characteristics are the same as for the asynchronous groupings mentioned earlier. However, in this case, the whole ensemble reacts to the cue so that all players start together. This results in no overlapping sonic layers. When this kind of event occurs, the visual cue made by the conductor corresponds with the beginning of the overall sonic outcome. For the first time in the piece, there is a clear and recognizable correspondence between the conductor and the performers. As a result, the audience can perceive these events in a more traditional way. Nevertheless, in this case the performers play fragments of their solos with different tempi from one another. In the score (Figure 3), the conductor marks the seconds (quarter note = 60), while the players begin their own fragments in their own tempi. The performers still have to enter according to the beat of the conductor for the overall synchronicity. As seen in the figure below, each of their fragments is framed in boxes that appear as windows relating the performers to their solos. The players relate to this part of the score as a reminder of their own singular identity (also associated to their own particular tempo as mentioned earlier).

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[53] Later on, I will discuss the term "field" in relation to paintings by Francis Bacon.

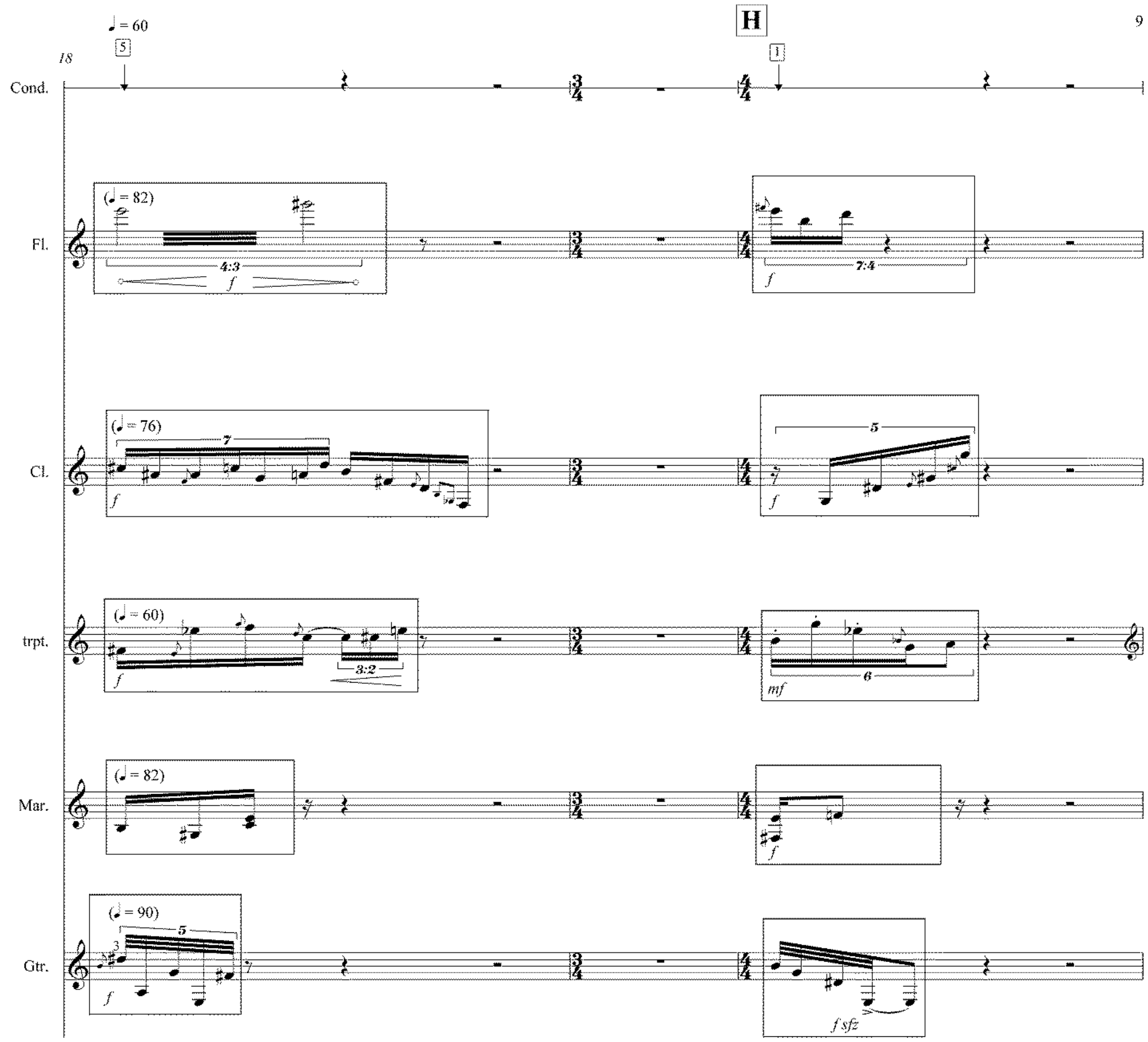

Figure 3 Fragment of *A Bao Qu*(M) score. Synchronous entrances with independent tempi. This figure does not show the full ensemble.

These synchronous entrances appear as complex polyrhythmic waves. This polyrhythmic characteristic avoids the perception of real rhythmical synchronicity. Throughout the silent fragments, I intended to evoke a reminiscence of the texture created by the overlapped solos from the very beginning of the piece. Due to this, I imagine the interruptions of sound after the short synchronic events as transitions. The rhythmical fragmentation between the sonic moments and silences are approached as a perceptual continuity. This relates to the idea of continuous presence mentioned earlier.[54] I imagine the relation between sound and silence that occurs in this section of *A Bao A Qu*(M) as myself looking through a window from where I can see a band playing. The band cannot be heard while the window is closed. When I open the window, I suddenly hear the sound. After a short amount of time, I close it again. In the silence of the moments with the closed window, I am still able to see the band, and after having listened to the music, I have a reminiscence of what the music sounds like. The reminiscence blends with the sounds inside of the room, influencing and transforming my aesthetic perception of the sonic environment.

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[54] As described in subchapter 4.2, continuous presence refers to a musical performance or environment that is perceived as always available and in continuous transformation.

This can also be associated with the notion of "virtual counterpoint". "Virtual counterpoint" refers to the perception of multiple voices in music played by one voice. Some movements of the partita for solo traverso (BWV 1013) by Johann Sebastian Bach can serve as an example. In these movements it is relatively easy to identify multiple overlapping voices displayed in one melodic line. If I do not consider reverberation as an aural factor, then the performance of these partitas can only be physically perceived as one melodic line. This monody is perceived as separate voices due to the cognitive processes helping us recognize rhythmical patterns that correspond to the different pitch ranges. The temporal gaps are virtually filled by a continuous presence that occurs in the relation between the notes in one voice. In the case of *A Bao A Qu*(M), I intend the long silences to be filled with the musical reminiscences transforming our perception of the environmental sounds. The notion of virtual counterpoint just described above allows me to imagine the fragmentation in *A Bao A Qu*(M) as a continuity. During the silences that participate in this fragmentation, our memory of the sounds just heard, will, on an imaginary level, blend with the real sounds of the environment producing a sensation of continuity.

In this section of the piece, the sounds produced by the musicians stop completely for the first time. A musical silence (or ending) reveals a fragmentation within the linearity of time. What happens during this silence? Does it increase the need to listen? Does it create a sense of dependency on being in a sonorous environment? Or does it create a feeling of uncertainty as the listeners were belonging to a sonic reality that suddenly has disappeared?

The moment of silence after music implies absence. To phrase this differently, the absence that arises during this moment becomes present. However, the space of absence is *always* present and available, although not necessarily consciously. "Presence in absence is not illusory presence; it is rather a special kind of availability. The world is present, in perception, not by being present (e.g. represented or depicted) in consciousness all at once, as it were, but by being available all at once to the skillful perceiver" (Noë 2012: 58). The skillful perceiver that the philosopher Alva Noë refers to here is able to perceive a sense of plurality, to perceive multiple and coexisting "presences". The alternation between silence and sound transforms the perception of each of these layers of reality. The perceptual transitions that occur through these alternations expose every new experiential layer as presence. In a musical context as in the one of *A Bao A Qu*(M), the experience of absence that arises during the sudden stop of sound transforms into awareness and to attentiveness. This suggests that silence becomes sonic presence. Absence during a musical silence amplifies listening, and as a consequence, the listeners immerse in the sounds that are revealed within the silence while simultaneously perceiving themselves as an active identity. A continuous alternation between silence and sound can also induce listeners to perceive a sense of absence from the sounding fragments, thus they are able to enhance their immersive sensations in both silent and sounding fragments.

These relations between absence and presence can be compared to John Cage’s approach towards silence and sound. For John Cage, silence is the continuous and transforming sonic environment of the world. Silence is the continuous presence of sound. In an interview, Cage describes this notion of silence using as an example the sound of traffic: “The sound experience which I prefer to all others is the experience of silence, and silence almost everywhere in the world now is traffic. If you listen to Beethoven or Mozart, you see they are always the same. But if you listen to traffic, you see it's always different" (Cage in Sebestik 1992). Cage’s differentiation of listening attitudes, as mentioned in this quote, refers to his notions of “nothing” and “something”. Listening to Mozart is a circumstance, a “something”. “Nothing” refers to the continuous presence that Cage perceives, in this case, in the sound of traffic. “Nothing” is the continuous and transforming sonic environment of the world from where “somethings” arise.

This relation of something and nothing can also be metaphorically related to astronomical approaches. As the astronomer Carl Sagan describes:

> (…) I stress that the universe is mainly made of nothing, that something is the exception. Nothing is the rule. That darkness is a common place; it is light that is the rarity. As between darkness and light, I am unhesitatingly on the side of light. But we must remember that the universe is an almost complete and impenetrable darkness and the sparse sources of light, the stars, are far beyond our present ability to create control. This prevalence of darkness, both factually and metaphorically, is worth contemplating before setting out on such an exploration (Sagan 2006: 2).

The constant presence of darkness and its spatial prevalence as described above relates to Cage’s perception of silence. However, in the physical reality of our world, the continuous nothing from which circumstances arise is active, in motion and it can transform into something. For Cage, “Nothing” (which correlates with silence) is always present and in motion:

> It is nothing that goes on and on without beginning middle or meaning or ending. Something is always starting and stopping, rising and falling. The nothing that goes on is what Feldman speaks of when he speaks of being submerged in silence. The acceptance of death is the source of all life. So that listening to this music one takes as a springboard the first sound that comes along; the first something springs into nothing and out of that nothing arises the next something; etc. like an alternating current. Not one sound fears the silence that extinguishes it. And no silence exists that is not pregnant with sound (Cage 1999: 135).

In this quote, Cage refers to a non-antagonistic relationship between sound and silence. The awareness of sound and music arises from silence. We become aware of sound events and silence through their mutual exposition through time. This exposition reveals their simultaneity and coexistence. In this simultaneity, they both have the potential to become, or to lead to what the other is (a something or a nothing). This relation can be related to my idea, given shape in *A Bao A Qu*(M), that immersion occurs through transitions and expositions of multiple coexisting realities. During the composition process of *A Bao A Qu*(M) I thought of the initial texture built up by the overlapped solos as a continuous presence, similar to the working of silence that Cage refers to in the quote above. As a consequence, two layers of "nothing" are proposed: the sounds of the environment (commonly perceived as musical silence), and the continuous musical texture underlying the whole piece. The overall music result played by the musicians is not conceived as the particular "something" that rises from the environment. "Somethings" can arise from the musical texture, from the sounds of the environment or from the interaction between both. At the same time, musical silence resonates in time, blending into the environmental soundspace. In this way the "somethings" that arise from the music not only relate to a musical silence but to multiple layers of reality. During the musical pauses, the sounds of the environment expose the musical texture as well as its reminiscence, and vice versa, the reminiscence of the musical texture amplifies and exposes the environmental sounds around the listeners. The alternation of sound and silence plus the reminiscence of previous musical textures immerse the listener, not only in the virtual characteristics of the musical dimension, but in a space where different layers of reality interact and coexist.

The awareness and aural attention that John Cage gives to silence comes from the interaction between silence and sound. This awareness arises from musical experience. The "submersion" in silence, that Morton Feldman refers to in Cage's quote above, does not come from simply being immersed in the everyday sonic environment. This comes from the exposition to the environment through music. The transitional nature of *A Bao A Qu*(M) aims at creating this exposition through the musical experience. The performance of the piece does not intend to be a contrasting and framed event separated from reality. Because the audience enters the hall while the musical texture is already present, the pauses that occur within the music are the first moments during which the environmental sounds take over. This amplifies the perception of the environment and intends to work as a musical negative, where the immersive approach is not towards the virtuality of the musical time-space, but towards a transformed experience of reality which brings a new world to light.

B. Traditional synchronicity: excluding the piano, all players share the same tempo following the conductor's marking. In this section, the pianist plays the final solo which has changing tempos independent from that of the group (see the bold line of the piano part in Figure 4 and a fragment of the solo in Figure 5). As a consequence, in the piece there is never a moment of real full synchronicity. Moreover, the musical texture that is performed by the ensemble does not express a rhythmic synchronicity. Each performer plays long sounds to create a continuous harmonic texture (Figure 4). My intention is that the long sounds first start to appear as resonances and echoes of the pitch material of the ongoing piano solo, and as the dynamic level of the harmonic texture grows, the piano solo blurs and blends into this texture. As a result, the audience listens to a continuous flow that has no clear rhythmic synchronicity. However, they are able to see the conductor marking the bars in a conventional way and the beat can be visually perceived. The non-corresponding relation between the individual tempos of the piano solo, the image of the conductor marking beats and the continuous harmonies lead the listeners to reflect about the performative events at the same time that these relations open a new aural space. This opening occurs because of the interaction between the familiarity and the comfort of the perceived visual convention with the seemingly unrelated sonic outcome. The visual convention is used to open multiple listening attitudes. The marking of the conductor is what we usually would expect to see. The sonic outcome appears as unrelated to these visual conventions. The familiarity and comfort of the convention persuades listeners to openly receive the sonic experience.

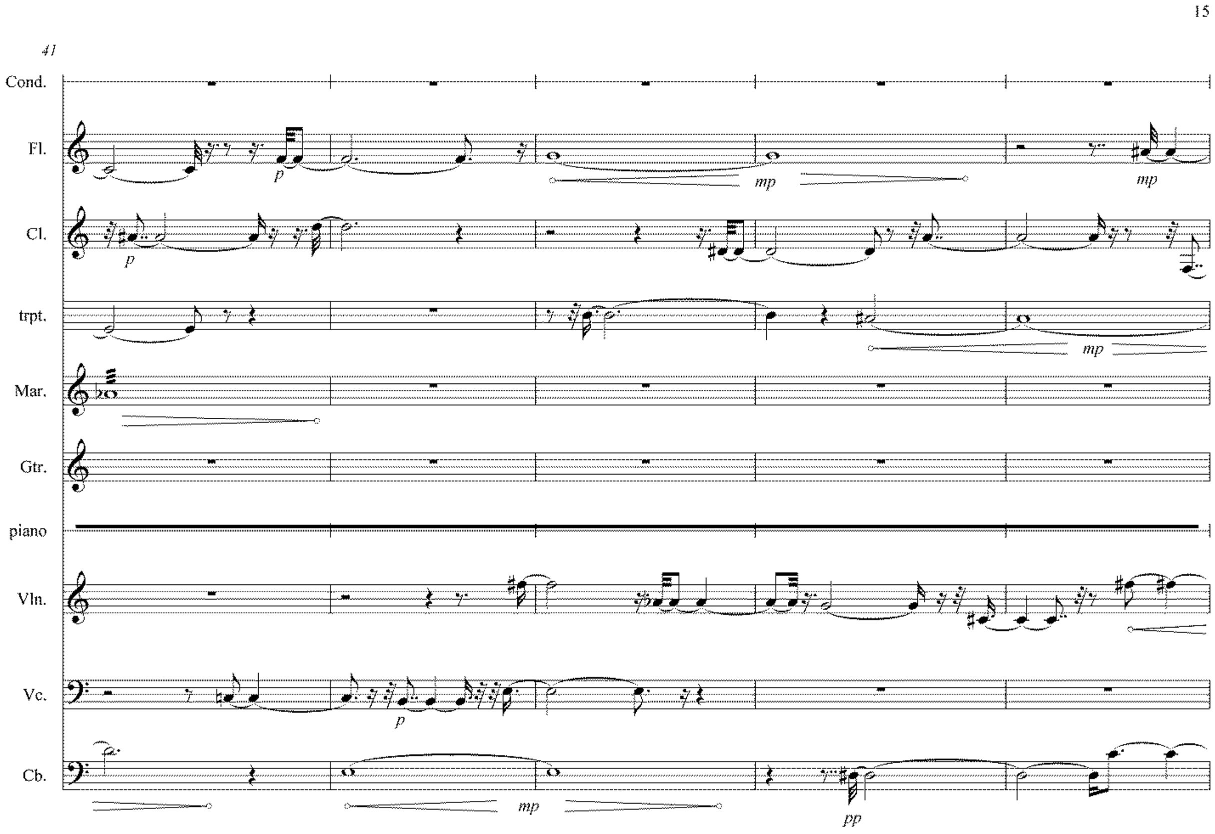
15
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Figure 4 Conductor's score (fragment). The music of the piano part is not visible in this fragment.

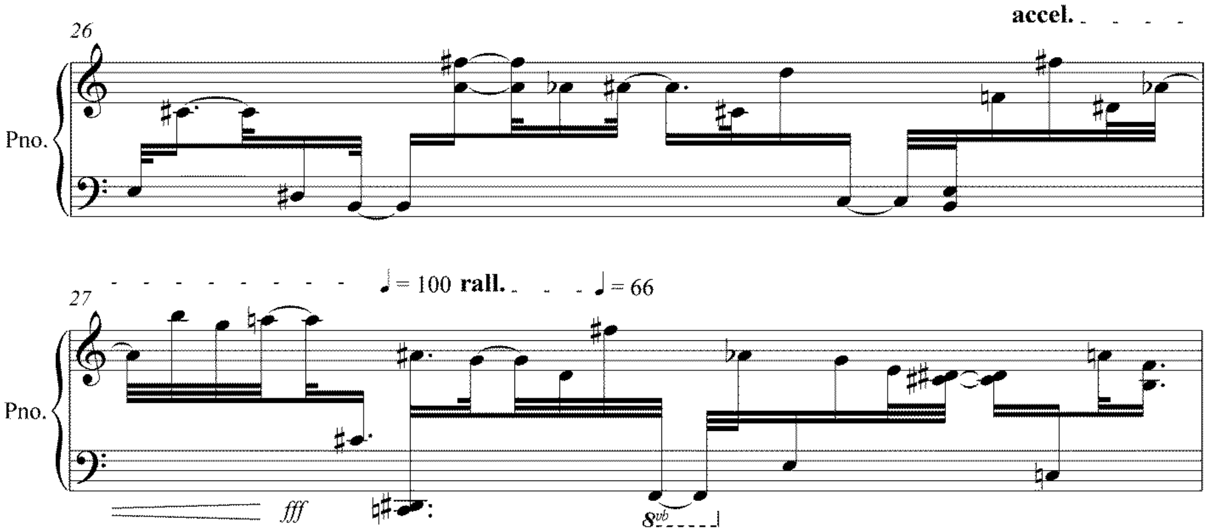

Figure 5 Fragment of final piano solo.

For the performers, this section appears to be a relief. Entering into a traditional way of following the conductor makes the performers feel more comfortable. The multiple levels of attention that are demanded in the previous sections are released. This resembles the problem that occurred in the reading of the score of *What About Woof?* when inverting the left-right logic of the score. As mentioned in the first chapter, the performers of *What About Woof?* felt uncomfortable with the inverted score. When I changed the score into a traditional left-right logic (as in a piano score), the performers felt more at ease and comfortable to perform. Less conventional communicational steps at the beginning of *A Bao A Qu*(M) also produced a similar discomfort to that which was perceived by the performers of *What About Woof?.* The main difference with *What About Woof?* is that in *A Bao A Qu*(M) the idea of producing a discomfort was a deliberate move. I was aware of the discomfort that the score and practice process were going to produce, as different and new levels of attention were demanded from the performers. The traditionally conducted section of *A Bao A Qu*(M) releases the performers from the tension that they had to undergo initially.

4.4 The final piano solo

The piano solo (Figure 5) comes from an unfinished trio (2008) for bassoon, piano and guitar. All of the pitch material from *A Bao A Qu*(M) comes from the piano solo, which itself is built from the pitch content of three bassoon multiphonics. When I was composing the trio, I chose this limited number of multiphonics for no specific formal reason. I liked the timbre and harmonic color of each multiphonic, and I imagined an interesting harmonic color by combining them. With Grzegorz Marciniak (Polish composer and bassoonist), I recorded and experimented with multiphonics that appear on the website www.leslieross.net. On this website, the Canadian bassoon player and builder Leslie Ross published a thorough study on bassoon multiphonics. She developed a tablature system connected to fingering diagrams where she classifies the different kinds of pitch content of the multiphonics (i.e. frequencies that appear in a spectral analysis, resulting tones that are not visible in the analysis, and notes related to the fingerings). Leslie Ross has continued to work on and improve the pitch analysis of each multiphonic presented. For this reason, the pitch material that I used in 2008 does not fully correspond to the updated multiphonic diagrams. On the website of Leslie Ross each multiphonic has a recorded example. Despite the clear relation between the written and the heard on Ross's site, when I experimented and recorded these multiphonics with Marciniak, the resulting noises and dynamics of each pitch within the multiphonics were different from those registered by Ross. Marciniak's recordings also gave me different sonic references from which to approach the pitch material. I internalized the pitch material by listening to Marciniak's recordings and not to the ones on the website. In the pitch material that I used in 2008, I quantized the microtonal pitches to equal-temperament to be able to use them on the piano. As a consequence, the reference material can be seen more as an excuse to gather material than a true emulation of the full content of the multiphonic. In any case, the tempered approximations resemble the harmonic colors of each multiphonic.

The clearly notated pitch content of each multiphonic (in Ross's diagrams) contrasts with the rich timbral texture and beatings (which occur in the three multiphonics) that are heard through the instrument. The sonic result contains the pitch content that is shown in the diagrams, but it produces a timbre that does not simply correspond to a traditional timbre of the bassoon. While playing multiphonics, the instrument produces other, more complex, sound textures than shown in Ross's diagrams.[55] The representational objectivity that is communicated through the score does not correspond with the complexity of the sonic result. In other wind instruments, it is also common to feature a new timbre during the playing of multiphonics. The beatings represent a musical element that results from the overlap of two close frequencies. The rhythm and speed of the beatings are no musical elements which can be intentionally articulated by the performer. Further on, I will describe how this contrast is related to the conflict between the objective and traditional clarity of the score of *A Bao A Qu*(M) and the actual sonic result.

In relation to Borges' narration, the final piano solo represents the culmination of the evolution of the A Bao A Qu. When everyone finds a common temporal communication, the A Bao A Qu is liberated. The piano solo reveals the original material of *A Bao A Qu*(M). For me, this moment of elucidation represents the moment in which the "originating" music starts. I perceive all of the music prior to the solo as a preparation for the "originating" music to appear, and as a sonic development that works as a transition from reality towards a musical experience. This thought reveals my intention that not all sounding events will be thought of as music, but as sound fields (related to Cage's notions on silence). This is not necessarily something that the audience will perceive or acknowledge. The chronological transition from the environment that precedes the concert hall until the solo intends to completely blur the musical fragmentation, and erase the separation between music and its surrounding reality. In *A Bao A Qu*(M) each layer of experience is chronologically added and experienced in the following order: First, the external sonic environment (sounds outside the hall). Second, the resonating hall (initial instrumental texture blended with the voices and sounds of the audience). Three, the musical texture (the audience is silent). Four, a pitch-based piano solo, containing the original materials of the previous musical layers. Each transition does not exclude the previous environment, but adds new layers to our perceptual reality. The reader might perceive my intention of composing a gradual appearance of musicality as an idealization. The experience of entering the hall may be perceived with an aesthetic and musical charge where all the transformations are already part of a framed musical process. My compositional approach thus differs from an approach where music is presented with a clearly defined beginning. The form of *A Bao A Qu*(M) is the result of the accumulation of sonic layers rather than of a structure of beginnings and endings.

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[55] The more complex sound textures presumably result from the sum and different tones produced when different frequencies occur in the same air-column.

The reason why I consider it relevant to describe the way I composed the piano solo is to reveal the immersive nature of the feedback loop between composing and listening that occurs in my compositional process (in reference to Vaggione's notions presented in the Introduction). The embodied sensation of my own aural experiences through the compositional process influenced the way in which I devised the composition. This might be common to most composers. However, in this case, I intentionally observed and reflected on the problems and interactions that arose between the imaginary space of the compositional process, my physical sensations, and my aural perception of the physical space.

4.5 Francis Bacon and resonance

> Isn't the space of the listening body, in turn, just such a hollow column over which a skin is stretched, but also from which the opening of a mouth can resume and revive resonance? (Nancy 2007: 42).

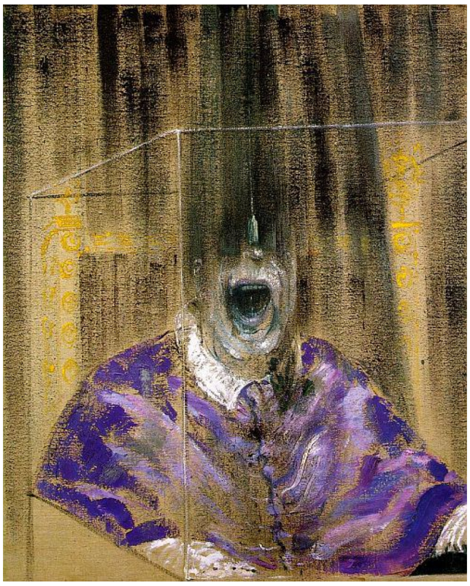

Figure 6 *Head VI* (1949) Francis Bacon

The presentation of multiple experiential layers transforms the perception of the overall environment. In the painting *Head VI* (1949) of Francis Bacon (Figure 6) there is a superposition of spatial and visual elements. There are three main elements: The body ("figure"), the cube and the vertical strokes that can be identified as a sort of background. The body of the human figure is framed in the cube. With this, Bacon seems to intend to focalize the attention of the viewer towards the isolated figure and into the framed space of the painting. In the book *Francis Bacon: The Logic of Sensation*, Gilles Deleuze discusses the notion of isolation in Bacon's works. The following argument describes isolation in relation to one of Bacon's triptychs:

> Not only is the painting an isolated reality, and not only does the triptych have three isolated panels (which above all must not be united in a single frame), but the Figure itself is isolated in the painting by the round area or the parallelepiped. Why? Bacon often explains that it is to avoid *the figurative, illustrative,* and *narrative* character the Figure would necessarily have if it were not isolated. Painting has neither a model to represent nor a story to narrate. It thus has two possible ways of escaping the figurative: toward pure form, through abstraction; or toward the purely figural, through extraction or isolation (Deleuze 2003: 2).

It is important to consider that the isolation and framed reality that Bacon is aiming at appears in a context of spatial sharing. Bacon designs a multi-spatial context for the viewers to focus on the isolated figure. Deleuze asks, "a Figure is isolated within a ring, upon a chair, bed, or sofa, inside a circle or parallelepiped. It occupies only a part of the painting. What then fills the rest of the painting?" (Deleuze 2003: 4). In the answer to this question, Deleuze describes the rest of the painting as being composed of spatializing *fields* which coexist with the figure:

> In fact, the rest of the painting is systematically occupied by large fields *[aplats]* of bright, uniform, and motionless color. Thin and hard, these fields have a structuring and spatializing function. They are not beneath, behind, or beyond the Figure, but are strictly to the side of it, or rather, all around it, and are thus grasped in a close view, a tactile or "haptic" view, just as the Figure itself is. At this stage, when one moves from the Figure to the fields of color, there is no relation of depth or distance, no incertitude of light and shadow. Even the shadows and the blacks are not dark ("I tried to make the shadows as present as the Figure"). If the fields function as a background, they do so by virtue of their strict correlation with the Figures (Deleuze 2003: 5).

The quote above describes an equal presence of fields. The expressive characteristics of the figure resonate in the resting layers of the painting. Bacon's intentions aim at focusing on the framed reality within the painting. However, in my perceptual experience, the resonance projected from the figure trespasses the frame of the painting due to the multiple spatial layers that coexist within it. The shared plain of the multiple fields ("not beneath, behind or beyond") offer a spatial projection of the sensation created by the figure. The equalization of multiple spatial layers results in an expansion of the process towards the outside of the painting's borders.

The field of vertical strokes creates a virtual space that blends with the surroundings of the painting. The cube where the portrait is contained can be considered as another layer. The body is not clearly defined. As a result, what captures the main attention is the open mouth, which, as an expressive figure, is the most defined part of the body. I experimented with covering the mouth of the painting with my finger, and as a result the disturbing feeling that is projected into the other layers of the painting disappears. By doing this, I realized how the spatial layers of the painting led me to the mouth as an inner point of attention. When I uncovered the mouth, I perceived the disturbing energy of the mouth projected onto the other spatial layers; the harmless plastic texture of the vertical strokes was suddenly charged by a disturbing sensation. The mouth "resonates" together with the other fields, which, in my opinion, abolishes a hierarchic structure. Once all fields are present and available they affect each other reciprocally.

The interactions that occur between an isolated figure and other visual fields, as in Bacon's perspective, can be related to the aural experience of the *A Bao A Qu*(M). In my piece, these interactions have to be thought of as extended through time. The sonic textures that appear throughout the piece can be compared to the spatial fields from the painting. The final piano solo can be compared to the more defined quality of the figure. For me, the piano solo is projected into temporal fields, into the past and into the future, blurring possible boundaries that listeners may perceive or construct. The more familiar sonic outcome of the piano solo can be understood as a form of identification. I associate this with the field made of the mouth's expressive clarity.

The resonance created by the expressive quality of the mouth can be connected to the opening "access" that is experienced in works of art, and to the multiplicity of worlds that is experienced through it, as presented by Nancy:

> Is this not what interests us or touches us in "literature" and in "the arts"? What else interests us about the disjunction of the arts *among* themselves, by which they are what they are as arts: plural singulars? What else are they but the exposition of an access concealed in its own opening, an access that is, then, "inimitable," untransportable, untranslatable *because* it forms, each time, an absolute point of translation, transmission, or transition of the origin *into origin.* What counts in art, what makes art art (and what makes humans the artists of the world, that is, those who expose the world for the world), is neither the "beautiful" nor the "sublime"; it is neither "purposiveness without a purpose" nor the "judgment of taste"; it is neither "sensible manifestation" nor the "putting into work of truth." Undoubtedly, it is all that, but in another way: it is access to the scattered origin in its very scattering; it is the plural touching of the singular origin. This is what "the imitation of nature" has always meant. Art always has to do with cosmogony, but it exposes cosmogony for what it is: necessarily plural, diffracted, discreet, a touch of color or tone, an agile turn of phrase or folded mass, a radiance, a scent, a song, or a suspended movement, exactly because it is the birth of a *world* (and not the construction of a system). A world is always as many worlds as it takes to make a world (Nancy 2000: 14-15).

In this quote, Nancy writes about plural worlds, and how art contributes to these. In the case of *A Bao A Qu*(M), this plurality manifests itself in and through listening. The sensorial experience of listening gives us access to this plurality; the significance of the surrounding stimuli does not need to be recognized through thought or through objective meaning. We are "being-with" in the experience of listening. Through listening, being-with can be thought of from three perspectives that occur simultaneously: The sound being with itself; the listener being with sound; the listener being with him- or herself.

> As soon as it is present, the sonorous is omnipresent, and its presence is never a simple being-there or how things stand, but is always at once an advance, penetration, insistence, obsession or possession, as well as presence "on the rebound" in a return [*renvoi*] from one element to the other, whether it be between the emitter and the receptor or in one or the other, or finally and specially, between the sound and itself (Nancy 2007: 15).

We can understand that in listening the referral is not perceived as a separate object with an attached meaning, but it exists in an active mobile form that happens through the phenomenon of resonance where "return" can be one of the main terms to describe how it operates. In *A Bao A Qu*(M), the experience of rebounds is presented within multiple layers. As a consequence, the different layers appear equally as references of each other. The presence of the piano solo intensifies this mutual referral. This creates a multiple immersive space where there is no "beneath, behind or beyond", but just coexistence.

4.6 The role of the score in open attitudes

The music of *A Bao A Qu*(M) is written with a double dynamic line. The main line consists of the normal dynamics assigned to notes and phrases within the score. Then there is a second line, which is placed below the main dynamic line. The second line indicates softer dynamics and a different dynamic phrasing for the music. The main goal of using two dynamic lines is to explore the unexpected sound results that occur due to the conflict that arises from trying to overlap a softer dynamic line over a traditionally defined music score. To develop this process, I composed the score with traditional pitch ranges and no extended techniques. These fit well within the habitual performance practices of the performer. However, the performers are required to go through a research process that aims at creating different sonic outcomes from the ones written in the score and to achieve an open listening attitude while performing. I gave the following instructions (which seem quite logical and traditional but aim at achieving a special performative mode and a sonic outcome that will be clarified later):

1. First step. Study the score in a slower tempo than the one indicated in your part.[56] By no means should you try to play it in the actual tempo.

2. Second step. Try to perform the score in the indicated tempo [Intentionally, I wrote figures that are physically impossible at the required tempo. This excludes the piano, percussion and guitar parts that can achieve a more articulate performance of the score in the actual tempo].

3. Third step. You should play the music at a softer dynamic level, which is indicated by dynamic equivalences:

f ff fff = very soft, a bit more articulate

mf = as soft as possible

mp = almost silence, let sound some articulating noises

p = silence, keep on performing mentally and possibly physically without sound

When the performers play after these instructions, the sonic outcome does not resemble what the score visually represents. Noises, silence and lack of precision dominate the sonic result. After practicing in the order mentioned above, the performers should be able to have a mental representation of the sounds that are written in the score at the same time that they allow themselves to listen to an outcome that does not correspond clearly to this mental representation.

As a result, the score works as an illusion; it results in a different sound world than what is represented visually. This illusion resembles the invisibility that occurs with the score of *La linea*. In *La linea,* the lack of musical information in each individual part, makes it difficult for the performers to imagine a sonic outcome. Most of the dynamic and rhythmic information is communicated through the movements of the conductor who has to be constantly watched by the performers. The movements of the conductor work as a choreography that complements the incomplete musical information given in the score. The performers discover the piece during the process of rehearsal when the conductor brings the choreographed score into motion. Here, the conductor is not only aiding to put the parts together or to produce a kind of musical expressiveness, but he/she is communicating specific musical information, not present in any of the parts, to the performers in real time. In *La linea* as well as in *A Bao A Qu*(M), the complete musical information can only be revealed while performing and interacting. This issue can be related to the sense of incompleteness that resides in open works. For Umberto Eco, open works need to have a complementary approach: "(…) the data collected in the course of experimental situations cannot be gathered in one image but should be considered as complementary, since only the sum of all phenomena could exhaust the possibilities of information" (Eco 1989: 16). In the case of both of my pieces, the invisibility (incompleteness) is uncovered in the complementation of its parts through performance (all of the musicians performing together). The main difference between the two compositions is that in *A Bao A Qu*(M) this discovery does not occur because of the absence of information in the parts. Here, the musicians begin working with a part that shows clear musical information (Figure 7). On the other hand, in the conductor's score most of this information is absent (Figure 8). Another difference between both pieces is that the representational characteristics in *A Bao A Qu*(M)'s score are gradually increasing due to its progressive synchronicity and to the gradual process towards a traditional way of performing the score, while in *La linea* the mechanism of the score remains stable. In *A Bao A Qu*(M) there are diverse levels of visual/aural representation. However, in the full score there is always an element that is left invisible. For instance, the last piano solo described earlier is not presented in the general score, while all other instruments are traditionally represented. The piano appears as a black bold line (as seen earlier in Figure 4). The incompleteness of the general score is not presented through formal and mobile mechanisms; neither is it explicitly communicated to the conductor, but experienced because it simply lacks specific information.

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[56] "Part" refers here to the individual performing material of each performer.

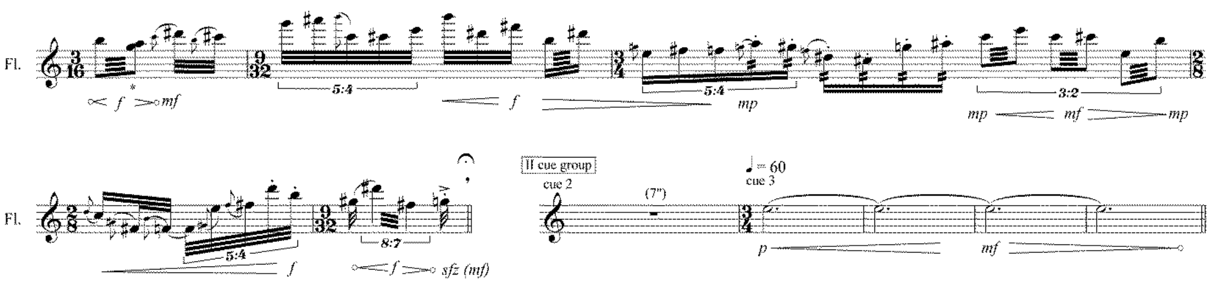

Figure 7 Fragment of flute part. This fragment is performed with the soft dynamics equivalence. The sonic result does not resemble the clarity of the notated figures.

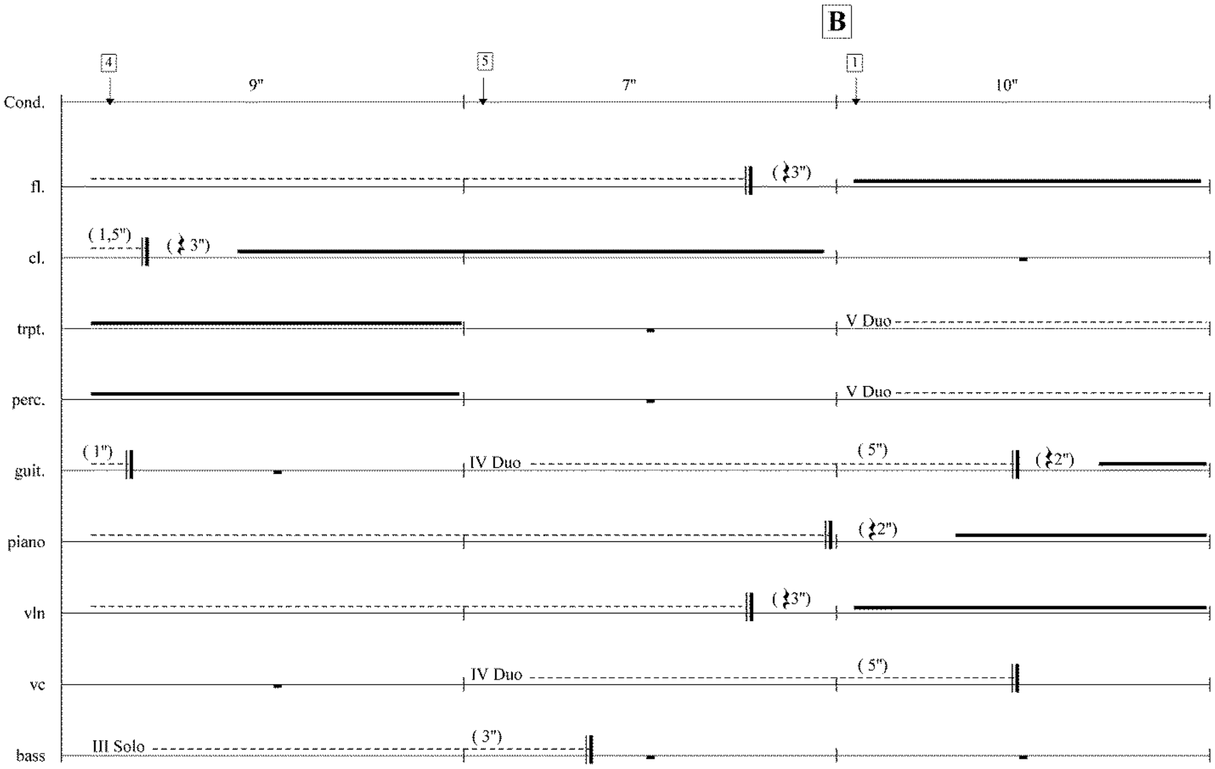

Figure 8 Conductor's score (fragment). The actual music of the parts is not visible in this fragment.

At the beginning of the piece, it is difficult to listen with clarity to specific articulated figures. This counts for the audience and the performers alike. What interests me most with this effect is that the musicians listen to the sonic result with a similar curiosity to that of the audience. The openness created here relates to the unpredictability of the sonic outcome. With this initial listening attitude, my goal is that, even through the process of increasing synchronicity, the performers should keep a more open attitude in their audition of the total result, in order for them to perceive the multiple layers of the musical experience and to musically project this new attitude.

One of the main perceptual characteristics of mobile works is the sense of unexpectedness that appears due to not knowing the exact sonic result. In mobile and open works, this generally occurs due to variations in the structure of the form or in variations within each musical line. This formal unexpectedness could be thought of as a kind of invisibility. Through mobile works the formal results are initially unknown. The elements that could not be deduced from the score could also be understood as "mobile unpredictability" as what is unknown is the order of events. On the other hand, my approach on invisibility refers to a musical gesture that is actually there; it has a defined position within the time structure of the composition. However, it cannot be seen in the score but only revealed during the performance. Invisibility in my practice is a visual incompleteness, whereas it is a structural incompleteness in mobile works. Both approaches, however, share a sense of unpredictability. My notion of invisibility offers the possibility to relocate open and mobile works within non-mobile musical contexts. In the case of invisibility, the perceived unexpectedness comes about mainly from the aural experience. The structure of the *A Bao A Qu*(M) score is not mobile (with the exception of the very beginning, where all solos are overlapped randomly). However, the complexity of the double dynamic line makes the performers produce sonic variations from performance to performance in spite of the fixed characteristics of the score. Nevertheless, the continuous practice of the score tends to a more stable and fixed sonic result. The important aspect of this is that the non-correspondence between the fixed score and the sonic result creates a space for an open audition. With "open audition", I refer to a listening attitude that does not objectify that which is "the listened". In every performance, that which is listened to by the performers presents itself as new due to its contrast from the representational objectivity of the score.

Openness through invisibility allows the performers to be aurally immersed. Immersion, in this case occurs as a result of combining objectivity (the fixed quality of the score) with an unknown sonic outcome. While focused on the music score, the performers are constantly listening to a musical result which appears to have its own nature. This experience can be associated to the notion that immersion occurs through losing our critical awareness of the objects that produce the sonic stimuli. In this case, the critical awareness is lost in the way that the aural outcome is separated from the musical notation. The aspect that causes the loss of objectivity is the aural experience which is not clearly related to the sounds represented in the score. Through this mechanism, the performers become simultaneously both performer and listener. In other more traditional scores, the music performers are also always listeners, but generally there is a correspondence between the score and the sounds that they intend to produce. In these cases, the performers perceive themselves more as emitters than receivers. In the case of *A Bao A Qu*(M), the non-correspondence between score and sound creates a sense of insecurity on behalf of the performers, because they are not sure that the emission they are producing is the correct one. This allows them to perceive themselves equally as emitters and receivers. As a consequence, they can share the experience of the audience and be immersed in the audience's listening attitude. This also has a spatial connotation. Since the attitude of the performers resembles the listening attitude of the audience, the audience space extends onto the stage. As a result, the attitude of the performers projects a sense of sharing.

When the audience comes into the hall, the sonic texture that is already present begins to take form in each listener. This can be related to the A Bao A Qu from Borges' narration. The A Bao A Qu does not show itself as something defined. This imaginary being is like a presence that gradually takes form in relation to the spiritual evolution of each visitor. With this, I imagine that each visitor creates a different kind of A Bao A Qu. In any case, in Borges' narration, the A Bao A Qu at the end of its development can manifest determined forms. These forms do not reveal themselves clearly until the end of the process of ascension and are potentially there as a hidden presence that is felt but not recognized clearly. Based on these characteristics, I perceive the sonic outcome that results from the use of soft dynamics as a hidden manifestation of the identity that exists in the score.

In the end of the piece, there is a return to a soft musical texture. In the case of the last section, the sounds are spatialized through a quadraphonic setup of loudspeakers around the audience. The sonic material is the same as in the beginning. I recorded the solos from the beginning as well as long sounds to use them as musical material for composing this last section. The final spatialized electroacoustic section aims at producing an opening of the aural perception of performers and listeners. The extremely soft sounds that come out from the surrounding speakers make the listeners unaware for some time what is actually sounding. It is not clear if the performers are playing or if it is an echo in their imagination. My goal is to produce a sense of uncertainty from which the listeners will open their perceptual awareness beyond the limits of the hall, leading them into a state of being-with, in resonance with the physical space. Related to Borges' narration, this end symbolizes the decent of the visitor and the gradual return of the imaginary being towards the first step. After experiencing *A Bao A Qu(*M), the listeners listen to themselves in resonance and still carry their own perceptual abilities which allowed *A Bao A Qu*(M) to fully form.

Conclusions

Throughout this dissertation, diverse approaches towards immersion and open work were transformed due to their relocation into a practice-based research context developed from a composer's perspective. The arguments of this dissertation arose from blending together my informed-intuitive ideas about immersion and open work (which emerged from my compositional practice) with existing theories and philosophical (phenomenological) perspectives on those topics. By encountering these existing theories from and through my artistic perspectives, a new space was opened to reflect about the subjects discussed.

Most of the arguments presented in this dissertation were developed from discoveries that appeared within this new space as a result of the productive encounters of academic research and artistic practice. During my research, I recognized that these encounters related to my proposal that immersion, as an experience of multiple realities, occurs due to the (sometimes conflicting) relations between the artistic proposal (music) and the context (cultural, psychological, social and spatial) that conditions our ways of experiencing art.

I did not intend to offer definitive conclusions, but to open a space of reflection and to present diverse creative perspectives which relate to notions of immersion. Perhaps the relation between musical practice and artistic research led to an argumentative structure that does not work as conclusively as might be expected from academic research. The literature that I studied during my research was used in a way that resembles the use of musical material. In general, the characteristics of musical material can be identified and understood before the material is used to create a composition. However, the way in which we perceive and understand these materials is transformed according to the way they are used in a composition. The musical styles and approaches in which given musical materials are used, are extremely diverse. For example, a composer could use the same algorithm or rhythmical patterns to create a reggae song, a complex new music ensemble piece, a spectral composition, or an electronic piece of *musique concrète*. Each of these musical outcomes transforms the way in which we perceive the characteristics of the musical material. In much the same way, the "original meanings" of the literature used, changed according to the subjects and artistic works to which they were associated. The resemblance of my research process to composing with musical material is furthermore reflected in the tendency to reuse the same references, quotes, and my own arguments throughout this whole dissertation. In each case, "similar" information appears from different perspectives and is related to different notions.

In the first chapter, I discussed how sight conditions the way in which we perceive sound and, vice versa, how sound affects visual perceptions. Most of the authors used as reference for contextualizing this notion are aware of this relationship. However, they mainly emphasize the differences between visual and sonic experiences; they discuss the differences between visual and aural perspectives, in order to give a phenomenological contextualization from which they can develop their ideas on listening in relation to immersion. Perhaps the main difference in my approach towards immersion in relation to sight and listening is the composer's perspective from which I have developed my arguments. My artistic work points towards a compositional attitude that considers visual and sonic elements simultaneously in order to produce a specific sensory effect; both elements are integrated. Every sound is affected by its visual gesture and visual context, and, conversely, every image is conditioned by the sonic environment. In contrast, composers such as Mauricio Kagel and Heiner Goebbels mainly use visual aspects with a theatrical emphasis. As I perceive it, in these cases the visual aspects are somehow superimposed on the music. To be sure, this approach also affects the way in which sounds are perceived, but the perceptual effects in these theatrical cases are more affected by the psychological and sociological associations created by the visual aspects than by the physical and psychoacoustic relations between the heard and the seen. In order to compose music with an immersive goal it is important for me to take into consideration the always-existing dynamic interaction between aural and visual elements. Especially in Chapter 1, I have demonstrated how my awareness of this relation affected the way in which the musical processes were developed. This awareness is reflected in a musical aesthetic and in an attitude towards composition which does not exclude vision from sonic perception.

An audio-visual approach is also common in the design and research of virtual realities (VR) and new media. In the case of VR, the audio-visual approach generally aims at aiding the simulation of real experiential conditions which creates a self-contained reality. In this way, the natural correspondence between the aural and visual can be used to achieve an experience that dissociates listeners-spectators from reality. However, the immersion that I propose aims at an experience where the introjected correspondences between visual and aural perception are transformed and presented in an entangled way that does not presuppose a separation from our everyday environment and reality. The goal is not to create a dissociative or virtual effect, but to expose what we would usually perceive as normal. In other words, through my works, I attempt to evoke immersive experiences that do not separate the aesthetic experience from a perception of reality. In this way, reality is thought of as a coexistence of multiple experiential layers (multiple realities). I have related this notion to Jean-Luc Nancy's book *Being Singular Plural*, his main argument being that existence is always coexistence, that being is always "being-with". By approaching being as a singular-plural ontological condition (as suggested by Nancy), immersion moves away from a sense of dissociation or separation from reality.

In Chapter 2 and 3, I mainly discussed spatial issues related to my approach on immersion. By defining, differentiating, and relating virtual and physical spaces, I questioned the tendency to think of a musical space as a framed space. To give examples of a "framed" approach towards space, I discussed two pieces by Iannis Xenakis and his ideas on spatial composition. Xenakis seems to describe and aim at immersive intentions. However, the sonic characteristics of the surrounding physical space appear for him to be an obstacle in designing the desired sonic spatialization. As a consequence, Xenakis' approach towards spatialization reveals his interest in creating a self-contained space that is composed by the virtual dimensions of sound. This concern also seems to be present in pieces in which he integrates existing or newly constructed architecture into his musical compositions. In these cases, the buildings become the musical world. It seems that for Xenakis the building as building has to disappear and merge into the aesthetic space he imagines. This can be connected to a perspective on immersion as dissociation. I have presented a contrasting idea in which the processes and sonic results of, for example, *La línea desde el Centro* and *Eufótica* show a blending of multiple spatial perimeters with a virtual sense of spatiality. For example, the spatial perimeters of *La línea* are the platform where the conductor stands, the space defined by the surrounding guitar players, the area of the hall where the setup is placed, and the hall itself. The virtual sense of spatiality relates to Eric Christensen's thoughts that listening to transformations and movements of "musical dimensions" such as timbre, pitch height, or rhythm evoke spatial impressions in the listeners mind as a virtual musical time-space (see Chapter 2). *La línea* and *Eufótica* propose immersion as an experience of coexisting multiple spaces, both virtual and real.

In Chapter 3, I also explored the differences and similarities between the perception of sound underwater and in air. Underwater localization of sound reveals a transformed perception of sound. Being underwater means being in an environment that belongs to one's physical reality. In other words, water does not represent another or a virtual reality. Through diving, people perceive sensorial transformations that expose the sensory diversity of their physical reality.
I have noticed a certain analogy with my artistic practice here. My musical compositions are not perceived as self-contained experiences separated from reality either. My music can be (or perhaps even should be) approached as a transformation within our perceptual reality. This perspective invites and incites the audience and the performers to perceive my music as a transitional experience that exposes multiple realities.

In chapter 4, I discussed my piece *A Bao A Qu*(M). With this piece, I intended to offer an aesthetic aural experience which is open and plural, and which integrates multiple layers of reality. One goal of the piece is not to present itself as a virtuality or as an experience that is separated from reality. Despite the fact that it carries the burden of its name (the resulting objectivity highlighted through the naming of a work), and that the audience will identify some sort of characteristic sonic result, its ultimate goal is to offer an experience in which the listeners do not focus on the objective characteristics of the piece's identity, such as form, material, functioning, style, etc. The conventional aspects of the performance space, of the score, and of the performative attitudes are transformed and only used as tools to activate the audience to achieve a multiple-directed sensory experience. In this chapter, I demonstrated how the conventions of musical practice and of musical presentation are used as focus points and intentionally transformed in order to absorb the listeners' attention towards the multiple sonic and spatial fields which are present in the musical experience.

At the end, in their transition back to the "normal" world, the audience, attending a performance of *A Bao A Qu*(M), perceives their own sensorial experience rather than focusing on their appreciation of the work itself. When we dive, we feel the temperature and the influence of the currents on our bodies. When we come out of the water, the wind cools the water on our skin, reminding our body that it is in resonance with the environment. In much the same way, the multiplicity of experiential layers of *A Bao A Qu*(M) reveals a non-alienating space where immersion is proposed to exist as a transitional experience between overlapping realities. The immersion into a musical reality exists simultaneously with the possibility to immerse into every layer of the world. Immersion is not a particularity, it is a continuous transformation, also happening outside aesthetic events in our everyday lives.

In all of my pieces discussed in this dissertation, I identified a sense of openness that resides in the lack of visual representation that the scores offer. This resulted in various reflections on this subject. In the process of rehearsing *What about Woof?*, the performers discover a visual choreography of movements through the performance of a traditionally notated score; it is not possible for them to deduce a visual representation of the composition by just looking. In *La línea desde el Centro*, the conductor and performers can only discover the sonic outcomes of the piece through their interactions. In *Eufótica,* the impossibility of precision due to the use of an invented musical instrument that is difficult to control, creates unexpected sonic results in each performance of the work, despite the precise notation in the score. In this case, the openness resides more in the instrument-as-problem than in the interactive relations such as in the previous two examples. Finally, in *A Bao A Qu*(M) a combination occurs of the performative issues of *La línea* and *Eufótica*, showing both interactive and instrumental openness.

The lack of representation in all of these pieces aids performers to regard the sonic result as a process of discovery. What this process reveals is that the scores only function as tools to achieve a performance and musical experience. However, this idea can be related to the working of any musical score. My approach mainly has a difference of degree with other scores. For example, in *La línea* each individual part contains hardly any musical information. The performers cannot practice their parts individually because the score is constructed in such a way that the piece can only be performed through interactive actions between performers and conductor. It is not possible to imagine a potential sonic outcome by looking at the general score or its individual parts. In the case of more traditional scores, musicians can play and practice their individual parts, and conductors can look at the general score and internally hear the notated signs. With these traditional music scores some levels of representation are possible. Conversely, the interactive actions of *La línea* communicate most of the musical information in real time. In this way, the perceived music separates itself from the "objectivity" that the score might offer. The openness that arises from this phenomenon relates to the notion that immersion does not occur as a separation from reality but as an experiential transition.

The sense of unexpectedness derived from structural mobility in open and mobile works (as proposed by Umberto Eco in *The Open Work*) can be related to the notion of invisibility (the sonic results that cannot be seen or represented in and through the score). Invisibility offers an experiential ground upon which the players discover themselves by performing, in an unknown musical world. The score serves as a focus point which takes advantage of the performers' conventional habits to transform their own performative musical experience. The notion of invisibility invites composers to consider fixed scores as tools to induce modes of openness and immersion. By proposing this compositional approach, I imagine that other composers can further investigate how one might create scores that induce open and immersive modes through experience, and not necessarily through open elements that are visible or communicated in the instructions of the score.

Musical experiences always transform our perception of the environment and, inversely, the environment always affects the way in which we perceive music. This interaction is what induced me to rethink immersion as an experience of multiple realities, in which the musical time-space and the surrounding reality equalize their roles. I have shown that there is a tendency to approach and understand immersion as a form of dissociation and as the experience of a new, self-contained reality. Through my musical works, I have presented phenomenological perspectives that questioned these views. The musical processes developed in these works reflect my (sometimes unconscious) intention of guiding the listener to focus more on that which surrounds the musical time-space. This relates to a musical experience where the listeners are immersed through a music that does not necessarily capture in itself their main attention, but rather allows them to aesthetically perceive the reality and environment in which they exist. As a consequence, immersion does not necessarily aim at creating a new reality but serves as a medium for perceptual transformation. This approach proposes immersion as an experience in between worlds, a space where diverse layers of reality are exposed and aesthetically transformed.

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Summary

This dissertation explores various perspectives on the term *immersion*, and its relation with, and transformation through, a composer's practice. Departing from the questions "how does music mediate people's perception of reality?" and "how does reflecting and studying this mediation affect the compositional practice?", *immersion* is presented as a key term to interconnect diverse aspects of music practice and listening. *Immersion* through music is proposed as a transitional experience that exposes and interrelates multiple layers of reality, thereby criticizing the tendency to think *immersion* as an experience within a particular or self-contained space (in music, in a book, in a virtual environment, in thoughts, in water, in a music hall, etc.). Musical experiences always transform one's perception of the environment and, inversely, the environment always affects the way in which music is perceived. From this premise, immersion is rethought as an experience of multiple realities, in which the musical time-space and the surrounding reality equalize their roles.

My artistic practice is essential in the development of this investigation. Through my musical compositions discussed in this dissertation, I attempt to evoke immersive experiences that do not separate the aesthetic experience from a perception of reality. In this way, reality is thought of as a coexistence of multiple experiential layers (multiple realities). I relate this notion to the main argument of Jean-Luc Nancy's book *Being Singular Plural* that existence is always coexistence, that being is always "being-with". By approaching being as a singular-plural ontological condition, as suggested by Nancy, immersion moves away from a sense of dissociation or separation from reality.

Besides rethinking immersion through music, I discuss how - by relating compositional processes to the phenomenology of musical performance and listening - the idea of openness can be associated to immersion. I argue that the relation between openness and immersion resides in their common lack of rigidity, and that an immersive experience is in itself open. Immersion in music can be achieved by diminishing the critical awareness of apparatuses or media (e.g. loudspeakers, computer screens, musical instruments, musicians, etc.) that produce sensory stimuli. As a result, an immersive context offers an open space containing undefined and multiple sensorial entry points.

Open and mobile works, as for example defined by Umberto Eco, refer to music in which the composer leaves specific elements of the composition to be completed by performers or audience. Departing from the question "what do performers perceive as open?" I focus on the receptive and performative side of openness rather than analyzing structural or mobile characteristics of notated musical works. From this perspective I introduce and elaborate the idea of openness through "invisibility". Invisibility refers to the sonic results that cannot be seen or represented in and through the score. Invisibility offers an experiential ground upon which the players discover themselves by performing in an unknown musical world.

My compositions *What about Woof?* (for five percussionists and video installation), *La línea desde el Centro* (for twelve guitarists), *Eufótica* (for six percussionists and tape) and *A Bao A Qu*(M) (for nine musicians and tape), analyzed and developed throughout my research trajectory, have been the main artistic sources to develop my ideas on immersion and openness. The compositional processes described and the reflections about *immersion* derived from them, offer different perspectives on the practical and phenomenological aspects of music composition, performance, and listening.

The main reference work in Chapter 1 is *What about Woof?*. This chapter departs from the question "how is sight immersive?", and extends this problem into a musical practice through the question "how can the visual aspects of a musical piece aid in achieving an immersive experience?" Throughout this chapter I argue against the (still) dominant idea that listening can be better associated to an immersive experience than visual experiences. I will claim that sight can also contribute to immersion because of the *introjected* abilities to relate to virtual and real images. I also describe how listeners and performers may achieve a mode of openness due to the visual setup of my musical works. Furthermore, I introduce the notion that a fixed score can induce a sense of openness when it does not offer the possibility of creating a clear visual-to-sound representation. The last part of the chapter contains a reflection on the relation between a performance environment and openness by describing the experiential differences between varied contexts in which the referred piece was performed.

Chapter 2 introduces the spatial attributes of an immersive experience having as its main reference work *La línea desde el Centro*. I analyze and reflect on the differences and relations between the virtual characteristics of the musical time-space and a given physical environment in relation to a compositional process. Various aspects of the compositional process of *La línea* are presented in order to demonstrate the effects of composing in relation to physical space. The chapter ends with a description of the open characteristics of the work under discussion. In *La línea* each musician's part is incomplete in itself and can only be completed through the interaction between performers and conductor. This feature of the work is presented to intimate the relation between invisibility and interaction.

Chapter 3 introduces the main ideas behind the composition *Eufótica* for six percussionists and tape. This chapter exposes theories of underwater sound perception. Having the underwater model as an intentional reference, this chapter shows how, through the compositional processes and results*,* it is possible to interconnect and further develop the notion of immersion as an experience of multiple realities and its relation to my musical practice.

Chapter 4 encompasses all of the issues previously discussed, and presents them in relation to my ensemble piece *A Bao A Qu*(M), which can thus be regarded as a concise musical reflection of the ideas developed in this research from its own particular musical perspective. This chapter describes how the sounds outside of the hall, sounds of the audience entering the hall, non-intended sounds during the performance, imperceptible sounds, acoustic sounds of instruments (with all of their dynamic, rhythmic and harmonic connotations), and prerecorded spatially amplified sounds are all considered in the compositional process and thought of as an essential part of the work. All these elements are combined to create a multilayered reality. The description of *A Bao A Qu*(M)*'s* compositional process serves to understand the musical origin that gives form to my argument about immersion as a singular plural experience. In this chapter I also propose that the sense of "being singular plural" is experienced in an open, immersive, and musical context, not as the acknowledgement of what it means to be “singular plural”, that is, not as a programmatic description nor as an exposition of the condition as it happens through language, but as an actual sonic embodiment of our singular plural condition.

Samenvatting

In dit proefschrift worden verschillende invullingen van het concept *immersie* onderzocht*,* in relatie met en getransformeerd door mijn eigen componeerpraktijk. Uitgaande van de vragen "hoe medieert muziek de waarneming van de werkelijkheid?" en "hoe beïnvloedt een bestudering van en reflectie op deze mediëring de compositorische praktijk?", wordt immersie geïntroduceerd als het sleutelwoord dat verschillende aspecten van de muziekpraktijk en het luisteren naar muziek met elkaar verbindt. Muzikale immersie wordt gedacht als een ervaring die verschillende werkelijkheidslagen blootlegt en met elkaar in contact brengt; dit impliceert een kritiek op het gangbare idee om immersie allereerst te beschouwen als een ervaring die plaats kan vinden in een aparte (virtuele) omgeving (die van muziek, van een boek, van het denken, van water, van een concertzaal, enz.). Iemands waarneming van de omgeving wordt getransformeerd door muzikale invloeden; en omgekeerd beïnvloedt de omgeving de manier waarop muziek wordt waargenomen. Vertrekkend vanuit deze premisse, wordt immersie herdacht als een ervaring van meervoudige werkelijkheden, waarin de muzikale tijd-ruimte en de omringende werkelijkheid een gelijkwaardige rol spelen.

Gedurende het onderzoekstraject, heeft mijn artistieke praktijk steeds een essentiële rol gespeeld. Door middel van mijn composities die hier worden besproken, heb ik geprobeerd ervaringen van immersie op te roepen waarbij de esthetische ervaring onscheidbaar is van de waarneming van de omringende werkelijkheid. Zo wordt die werkelijkheid gedacht als een co-existentie van meerdere ervaringslagen, ofwel van meervoudige werkelijkheden. Ik baseer dit idee op de centrale these in Jean-Luc Nancy's boek *Being Singular Plural*, namelijk dat existentie altijd al co-existentie is, dat "zijn" altijd "zijn-met" betekent. Door "het zijn" te beschouwen als een enkel-meervoudige ontologische staat, zoals Nancy voorstelt, kan immersie op een andere manier gedacht worden dan als een gevoel van dissociatie en/of het afgescheiden moeten zijn van de werkelijkheid.

Naast deze heroverweging, via muziek, van het concept immersie, bespreek ik - door compositorische processen te verbinden met de fenomenologie van de uitvoeringspraktijk en het luisteren - hoe het idee van openheid in verband kan worden gebracht met immersie. Ik beargumenteer dat de relatie tussen openheid en immersie berust op hun gezamenlijke afwijzing van een starre onbuigzaamheid en dat een immersieve ervaring uiteindelijk in zichzelf al open is. Muzikale immersie kan worden bereikt wanneer iemand zich minder bewust is van de dingen of media die zijn/haar zintuiglijke prikkels stimuleren (bijvoorbeeld luidsprekers, computerschermen, muziekinstrumenten, musici, enz.). Op basis hiervan betoog ik dat een immersieve context een open ruimte creëert die niet vooraf bepaalde en meervoudige zintuiglijke indrukken mogelijk maakt.

Open en mobiele werken, zoals bijvoorbeeld gedefinieerd door Umberto Eco, verwijzen naar muziek waarin bepaalde elementen van de compositie voltooid moeten worden door de uitvoerenden of door het publiek. Uitgaande van de vraag "wat nemen uitvoerende musici waar als open?" richt ik mij daarentegen op openheid vanuit de receptieve en uitvoerende kant en niet op een analyse van de structuur of de mobiele eigenschappen van de genoteerde muziek. Vanuit dit perspectief werk ik het idee van openheid via onzichtbaarheid uit. Onzichtbaarheid refereert hierbij aan die sonische resultaten die niet weergegeven kunnen worden in of via een partituur. Onzichtbaarheid biedt een experientiële basis van waaruit de uitvoerenden zichzelf leren ontdekken door te musiceren binnen een onbekende muzikale wereld.

De voornaamste artistieken bronnen die ik heb gebruikt om mijn ideeën over immersie en openheid verder te ontwikkelen, zijn mijn gedurende het onderzoektraject tot stand gekomen en geanalyseerde composities *What about Woof*? (voor 5 percussionisten en een video installatie), *La Línea desde el Centro* (voor twaalf gitaristen), *Eufótica* (voor zes percussionisten en tape) en *A Bao A Qu*(M) (voor negen muzikanten en tape). De compositorische processen die ik beschreven heb en de daarvan afgeleide reflecties op het concept immersie, bieden verschillende perspectieven op zowel de praktische als de fenomenologische aspecten van het componeren, het uitvoeren en het beluisteren van muziek.

Het belangrijkste werk waarnaar verwezen wordt in hoofdstuk 1 is *What about Woof*?. Het hoofdstuk begint met de vraag hoe visualiteit immersief kan werken en verlegt dit probleem naar de muzikale praktijk via de vraag hoe de visuele aspecten van een muzikaal werk kunnen helpen om tot een immersieve ervaring te komen. Ik reik in dit eerste hoofdstuk bezwaren aan tegen het (nog steeds) dominante idee dat luisteren beter geassocieerd kan worden met immersieve ervaringen dan visuele indrukken. Ik betoog dat visualiteit ook kan bijdragen aan immersie en wel door middel van de zogenaamde *introjected abilities* om virtuele en echte beelden met elkaar in verband te brengen. Ik beschrijf tevens hoe zowel luisteraars als uitvoerende musici een soort openheid kunnen ervaren via de visuele set-up van mijn muzikale werken. Voorts introduceer ik de idee dat een partituur die vastligt toch tot een zekere openheid kan leiden wanneer die partituur het onmogelijk maakt om een duidelijke overgang van het visuele naar het auditieve te realiseren. Het laatste deel van hoofdstuk 1 bevat een reflectie op de relatie tussen openheid en de uitvoeringsruimte door in te gaan op de experientiële verschillen tussen de concrete contexten waarin *What about Woof*? werd uitgevoerd.

In hoofdstuk 2 ga ik dieper in op de ruimtelijke aspecten van een immersieve ervaring door die te betrekken op *La línea desde el Centro*, het centrale muzikale werk hier. Ik analyseer en reflecteer op de verschillen en relaties tussen de virtuele karakteristieken van de muzikale tijd-ruimte en een bepaalde fysieke omgeving gerelateerd aan een compositorisch proces. Diverse aspecten van de totstandkoming van *La línea* worden besproken om de effecten van het componeren in directe relatie tot een fysieke uitvoeringsruimte toe te lichten. Het hoofdstuk eindigt met een beschrijving van de open eigenschappen van het genoemde werk: in *La línea* is de partituur van elke afzonderlijke partij op zichzelf onvolledig; deze kan alleen volledig worden gemaakt door de interactie tussen de uitvoerende musici en de dirigent. Dit specifieke kenmerk van *La línea* wordt benadrukt om de relatie tussen onzichtbaarheid en interactie duidelijker te maken.

Hoofdstuk 3 bevat de voornaamste ideeën die hebben geleid tot *Eufótica*, een compositie voor zes percussionisten en tape. Dit hoofdstuk belicht theorieën over het waarnemen van geluiden onder water. Het daaruit voortvloeiende theoretisch model fungeert als een intentioneel kader om aan te tonen hoe het mogelijk is om, via compositorische processen en resultaten, de idee van immersie te verbinden met en verder te ontwikkelen als een ervaring van meervoudige werkelijkheden (en dit in relatie tot mijn eigen compositiepraktijk).

Hoofdstuk 4 omvat alle kwesties die voorheen besproken werden en brengt ze samen in relatie tot mijn ensemblewerk *A Bao A Qu*(M), dat beschouwd kan worden als een bijzondere en beknopte muzikale weergave van de ideeën die ik ontwikkeld heb tijdens dit onderzoek. Dit hoofdstuk beschrijft hoe geluiden buiten de concertzaal, geluiden van het publiek dat de zaal binnenkomt, onbedoelde geluiden tijdens de voorstelling, onmerkbare geluiden, (bij)geluiden van instrumenten met al hun dynamische, ritmische en harmonische connotaties, en vooraf opgenomen en versterkte geluiden worden opgenomen in het compositorische proces en worden beschouwd als essentiële onderdelen van het muzikale werk: al deze elementen worden gecombineerd om een meerlagige werkelijkheid te creëren. De beschrijving van de totstandkoming van *A Bao A Qu* dient om de muzikale oorsprong te begrijpen die vorm geeft aan mijn argument om immersie te benaderen als een "enkel-meervoudige ervaring". In dit hoofdstuk betoog ik tevens dat het gevoel van "enkel-meervoudig zijn" (*Being Singular Plural*), wordt ervaren in een open, immersieve, en muzikale context, niet door op zoek te gaan naar wat "enkel- meervoudig zijn" betekent – dat wil zeggen, niet als een programmatische beschrijving, en ook niet als een taalhandeling – maar als een daadwerkelijke sonische belichaming van ons enkel-meervoudige bestaan.

Curriculum Vitae

Miguelángel Clerc Parada was born in Santiago, Chile, in 1979. He is a composer, performer and researcher.

Clerc has composed music for soloists and ensembles in Europe and South America, for example the Nieuw Ensemble, Ensemble Klang and Ensemble Modelo62 (The Netherlands), CIMA and Ensemble Taller de Música Contemporánea (Chile), and Schlagquartett Köln (Germany). He is currently collaborating with the choreographers Pedro Goucha Gomes, Cora Bos-Kroese, Marina Mascarell, Karine Guizzo and Heidi Vierthaler.

His music received the *Proms Prize* 2006 in *Paradiso* (Amsterdam) for the piece *Paradiso's Pendulums* composed in collaboration with Grzegorz Marciniak. His composition *What About Woof?* (for five percussionists and video installation) was selected for the *Gaudeamus Composition Competition* 2008. In 2011 *Eufótica* (for six percussionists) was nominated for *Premios Altazor* (Chilean awards for the arts).

He studied classical guitar with Roberto Perez, Alejandro Peralta and Henk Westhiner, and composition with Alejandro Guarello at the Universidad Catolica de Chile, where he obtained a Bachelor's Degree in Music Composition in 2000. Further studies in composition were pursued under Martijn Padding, Gilius van Bergeijk, Cornelis de Bondt and Yannis Kyriakides at the Koninklijk Conservatorium (The Hague, Netherlands) where he obtained a Postgraduate Diploma in Composition in May 2006 and a Master's Degree in May 2008.

Additionally, he has attended seminars and master classes with the composers Emmanuel Nunes, Salvatore Sciarrino, Giacomo Manzoni, Gabriel Valverde, Beat Furrer, Mario Lavista, Julio Estrada, Manuel Lopez Lopez, Tristan Murail, Rozalie Hirs, and others.

More information can be found on www.mclerc.com