

# MUSICAL EXPERIENCE BEYOND AUDIBLE SOUND AND ITS RELEVANCE FOR ELECTRO-ACOUSTIC COMPOSITION

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## ABSTRACT

This paper addresses the question as to how far music is experienced independently of the presence of sound. A number of musical examples are discussed in order to show that inner and mental forms of listening not only play a decisive part in the musical experience, but that they cannot be removed from the perception of any musical event. The conclusion is drawn that sound can never be perceived 'as such' but that it is always interpreted, extended and complemented by inner listening processes. The last chapter of this paper debates if the incitement of inner listening processes is relevant for electro-acoustic music, as the post-medium characteristics of the computer allow for a very nuanced application of sounds with referential qualities.

Key aspects that are discussed are *Auditory Imagery*, *Audiation*, *extrinsic* and *non-cochlear listening*.

## 1. INTRODUCTION

For quite some time I have had a strong interest in the various ways in which sound and lighting can engage in a meaningful relationship with each other, as part of artistic works. I pursued the question whether there is anything like *visual music* in the meaning of a genuine sensory experience and not merely as a metaphor for formal organization.<sup>1</sup> Put more precisely: I was wondering if it is possible to transfer musical qualities and methods of expression to visual media in such a way that a sense of *musicality* is actually preserved. This would imply that the experience of musicality is

independent of the perception of acoustic vibration.

Taking this line of thought a step further, I asked myself whether also other non-sonic events, apart from visuals, can also be experienced as *musical*. Does music actually exist as an external phenomenon, or is it a culturally conditioned category of perception that is independent of sonic phenomena and which leads us to perceive certain patterns of stimulation, or even just a particular state of mind as *musical*?

With this question in mind I wondered which other manifestations musical experiences can take that are beyond the sonic or the visual. What I am focussing on in this paper concerns inner and mental forms of hearing. Specifically, I am looking at a number of instances that show that various mental forms of inner hearing influence auditory and musical perception. Given the size of the paper I can only hint at them, without exploring them in depth. This could become the subject of future publications.

## 2. GAVIN BRYARS' MUTE MUSIC

In 2010 I had the pleasure to work with the Belgian ensemble *Champs d'Action* on a new version of Gavin Bryars' composition *The Sinking of the Titanic*. My task was to perform live-electronics. Today, this piece consists of a loose collection of materials that can be arranged in a flexible manner according to a given time scheme. However, as I learned during the rehearsal process from the musicologist Maarten Beirens, the very first version of the piece looked significantly different.

The original version dates back to 1969, when Bryars was teaching at art academies in Portsmouth and

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<sup>1</sup> Eventually this research resulted in my dissertation titled "Dirty Light: The application of musical principles to the organization of light as an extension of musical expression into the non-figurative visual realm", that I completed at Brunel University London in 2010.

Leicester. He was interested in creating a visual counterpart to Conceptual Art, which was new at that time and widely discussed amongst his students. The material of *The Sinking of the Titanic* consists of various things that are related to the sinking of the luxury liner. Part of it consists of compositions that might have been played by the ship's band the night of the sinking. Furthermore Bryars collected Morse codes that have been exchanged between the Titanic and other ships during the accident, as well as interviews with survivors and some other materials. Simplified, it can be said that the composition is a collage of these materials. However, interestingly the first audio version of the piece was realized in 1972, three years after the original version. The first version consisted of a visual presentation of the mentioned materials in the form of an exhibition. By choosing this form of presentation, Bryars intended to let the musical experience happen in the imagination of the audience.

All of these different elements on display had a potential acoustic reality. Instead of using them as concrete sound – as Bryars did in the later concert version of the work – in the 1969 version he opted for letting them manifest themselves acoustically in the inner ear of the beholder. Each viewer could therefore experience the material in a very personal version. Bryars thus succeeded in creating a straight-forward musical realisation of some of the core ideas of Conceptual Art. From the point of view of visual art, Conceptual Art can be described as a *non-retinal* form of art, in the sense that artistic practice is not primarily interested in the materiality of a given object, but in its potential as a signifier in an expanded context. The retinal or visual aspect is thereby only a gateway into a mode of perception where a large part of the experience of a particular work of art happens in the imagination. The mental expansion of the art-object and the spinning out of ideas that it incites is often the most significant aspect of the work.

Marcel Duchamp coined the term *non-retinal art* and his so-called *Ready-mades* are often referred to as the first

objects of Conceptual Art. Probably the most famous amongst them is *Fountain* (1917).<sup>1</sup>

Seen in this context, what Gavin Bryars has done with the original version of *The Sinking of the Titanic* can be referred to as a form of *non-cochlear sonic art* – a term that the artist and writer Seth Kim-Cohen used and analysed in his book *In the blink of an Ear*.<sup>2</sup> *Cochlea* is the medical term for an organ in our inner ear, that is responsible for translating the mechanic vibration that reaches our ear into neuronal stimulation which is then further processed in our brain. Hence, the cochlea has the same function for hearing that the retina has for vision.

The 1969 version of *The Sinking of the Titanic* might therefore be referred to as a *mute* composition, but not a *silent* one, as it can invoke an abundance of sound in the imagination of the viewer. For this reason it can not be compared to compositions that are questioning a traditional notion of musical sound with the ostentatious presentation of silence as John Cage has done with *4'33"* (1952) or even earlier Erwin Schulhoff with *In Futurum* (1913) and Alphonse Allais with *March Funèbre* (1897)<sup>3,4</sup>.

### 3. AUDITORY IMAGERY

The invocation of sound without the actual presence of acoustic vibration is what Bryars tried to achieve. This is part of a phenomenon commonly referred to as *auditory imagery*. There is nothing mysterious about *auditory imagery* as it is something that is performed whenever we try to remember a piece of music, a particular sound or even a spoken text. In experiments it has been possible to detect *auditory imagery* as neuronal activity.

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<sup>1</sup> At the occasion of the Turner Prize 2004 this work has been selected as the most influential work of art of the 20<sup>th</sup> century, in a survey amongst artists and art critics  
<http://news.bbc.co.uk/2/hi/entertainment/4059997.stm> (14/06/11).

<sup>2</sup> Kim-Cohen, Seth: *In the Blink of an Ear*, New York: Continuum, 2009.

<sup>3</sup> Glasmeier, Michael: Marcel Duchamp, *John Cage und eine Kunstgeschichte des Geräusches*, in: *Resonanzen*, ed.: Bernd Schulz, Heidelberg: Kehrer, 2002, p.49.

<sup>4</sup> All three examples are presenting an absence of performative actions, rather than an absence of sound. Nevertheless they address and question the traditional idea of silence.

In these experiments music has been played to test persons while gaps of silence have been cut in with a duration of 2-5 seconds. When the test persons were familiar with the music played, a rise of neuronal activity has been measured during those gaps, which was not present when the music was unfamiliar to the test persons. This has been interpreted that in the former case the music is filled in by the imagination of the listener.<sup>1</sup> However, if the music is unfamiliar the listener cannot amend it. Hence, *auditory imagery* cannot take place and the neuronal activity remained low. This also shows that *auditory imagery* relies on the previous knowledge of the person. What has never been experienced cannot be imagined as a sound, no matter whether it is a piece of music, a particular sound or a foreign language. Even when we invent new sounds or compositions in our imagination, we draw on our experience and recombine it in various ways.

The interesting thing about *auditory imagery* is the multifaceted role it can play for the experience of music, no matter whether the music is actually sounding or imagined. It is the vehicle for many forms of musical experiences that take place in the inner ear. For instance, when listening to a cover version of a pop song *auditory imagery* plays a crucial part of the musical understanding. Many cover versions are based on the assumption that the listener knows the original version of the song. Their appeal is often based on detailed differences to the original version. If the receiver is not familiar with the original and therefore fails to recognize that a cover is being played, a significant part of the artistic intention cannot be understood. What actually takes place when we listen to a cover version is a constant comparison to the original, as if it was running as a parallel soundtrack in the imagination of the listener. This largely sub-conscious process is therefore an essential part of the musical experience.

#### 4. EDWIN GORDON'S AUDIATION

The comparison between sounds that are remembered and expected to those that are actually perceived is not something confined to the reception of cover versions but rather a general phenomenon when we listen to any familiar style of music. For instance, when an experienced listener hears the beginning of a classical piece of music, he or she might soon recognize it as a sonata. This entails the expectation that some form of development section will follow, as well as a recapitulation. Some composers, like for example Beethoven, have consciously played with such expectations and occasionally fooled the listener by composing pseudo-recapitulations<sup>2</sup>. Such tricks show that the composer expected a certain level of sophistication and expertise from his listeners. Why else would he want to surprise them with a pseudo-recap, if he would not expect them to recognize such a cunning move? In order to distinguish such sorts of style-dependent and genre-dependent recognitions and anticipations from more ordinary types of *auditory imagery*, the term *Audiation* comes in handy, which was coined in 1975 by the music educator Edwin Gordon. He explained in his own words:

...when you are audiating as you are listening to music, you are summarizing and generalizing from the specific music patterns you have just heard as a way to anticipate or predict what will follow.<sup>3</sup>

Edwin Gordon developed a specific learning theory on the basis of recognition and anticipation processes, which, in turn, relied on the agglomeration of a specific musical knowledge. It is implicit in this understanding of music education that memory plays an essential part when we listen to music. Whether or not expectations are fulfilled determines an important part of the musical

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<sup>1</sup> [www.nature.com/nature/journal/v434/n7030/full/434158a.html](http://www.nature.com/nature/journal/v434/n7030/full/434158a.html) (13.06.11).

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<sup>2</sup> For example the first movement of the piano sonata op.14/1.

<sup>3</sup> Gordon, Edwin, *Learning Sequences in Music: Skill, Content, and Patterns*, Chicago: G I a Pubns, 1997, S.5.

experience. Whenever we recognize intrinsic references within a work of music, like for example the reoccurrence of a particular musical motif, we drawing on the short-term memory that has been built up since the piece started. However, when we deal with the recognition of a genre, as in the aforementioned example with the classical sonata, we reach back to our long-term memory. In this case we are comparing what we are hearing with listening experiences that we have made in the more distant past.

Both forms of memory are an essential part of the listening process. They are musical experiences from the past. Triggered by an actual sound, they are not sounding themselves but they are added to the experience of the sound as a mental activity.

With *Audiation*, recognition and anticipation stem from a particular notion of musical culture. These processes are however almost the same as the inner ongoing comparison of a cover version with its original. In both instances inner listening processes are determining factors in how the music is perceived.

## 5. EXTRINSIC REFERENCES

The entire domain of inner listening processes becomes even more complex if we add *extrinsic references* to the equation. Extrinsic listening refers to all sorts of associative references entailed by sounds – references that point to things that lie beyond the objective material condition of a sound. We experience *extrinsic listening* for example if we recognise a locomotive in Pièrre Schaeffer's seminal work *Cinq études de bruits*. In the first of these *études* the sound of a train is used as abstract material for the composition. At the same time the sound's origin is identified by the listener, which creates a link to the world outside of the intrinsic structure of the composition.

Another example of extrinsic reference is the use of the mandolin in Gustav Mahler's 7<sup>th</sup> Symphony. The function of this instrument is more than just to add another colour to the orchestral apparatus. Its function is also to evoke a Mediterranean atmosphere since this is

the culture and ambience this instrument is usually associated with.

A more unusual extrinsic reference is at hand with the example of Frédéric Chopin's piano etude op.10 Nr.1. This piece opens a cycle of 24 etudes with large arpeggios in the C-major key that are spanning practically across the entire keyboard. Even though this is a genuine composition, Chopin is at the same time referring to Johann Sebastian Bach's Prelude Nr.1 of the *Well-tempered piano*. It is no coincidence that this is another cycle of 24 pieces that is opened with arpeggios in the C-major key. Chopin deliberately started his cycle in a corresponding fashion to Bach, in order to show his deep admiration for his music. This is an entirely different sort of reference than the aforementioned ones as it can only be deciphered by the real *connoisseur* who has a very solid knowledge of piano literature. Such an extrinsic reference has resemblance to *Audiation* because it points to a concrete body of knowledge. Here, the borders between extra-musical references and musical literacy become blurred. *Auditory Imagery*, *Audiation* and *extrinsic listening* are therefore areas that cross into each other seamlessly.

## 6. THE VACUITY OF REDUCED LISTENING

The different sorts of non-cochlear listening that thus far have been discussed show that what our ear perceives is only part of what we hear. Our memory and imagination are constantly adding to what reaches our ears. Because of the constant activity of our inner hearing, we are incapable of hearing the sound 'as such', as every sound comes along like Duchamp's *Fountain*: ready to be filled with associations and meanings according to a given context.<sup>1</sup> Even when any sort of associative listening is actively suppressed, as Pièrre Schaeffer proposed as part of *reduced listening*, no listener can create a cultural vacuum in himself or herself, which would be the

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<sup>1</sup> This argument strongly contradicts the notion of many trends in more recent electronic music that deliberately focus on sound as a medium that is believed to be devoid of any referentiality. See Demers, Joanna: *Listening through the Noise*, New York: Oxford University Press, 2010, p.69-113

precondition for an unbiased phenomenological perception. Schaeffer's practicing of *reduced listening* was an attempt to purify music of non-musical elements. Non-musical sound was traditionally described as noise – an undesired sound in a particular context. With Schaeffer the non-musical is not located in the sounding material anymore, but inside the listener in the form of associative responses to sound. *Reduced listening* therefore describes a mental behaviour that is imposed on the listener, a disciplined way of hearing.

## 7. THE RELEVANCE OF EXTRINSIC REFERENCES FOR ELECTRO-ACOUSTIC COMPOSITION

The blurring of the edges between music and environmental sounds may eventually prove to be the most striking feature of all twentieth-century music.<sup>1</sup>

This quote by Raymond Murray Schafer implies that music has increasingly taken on qualities that are referential. All environmental sound communicates something about itself and refers to its cause or source. If music becomes more similar to environmental sound it therefore also gains a higher amount of referential qualities.

I would argue that an awareness for sounds' referential potential, which entails inner forms of listening, is even more relevant for artists working in the field of electro-acoustic music, than those working with traditional instruments. The computer is a tool, which is largely devoid of medium specificities and is therefore often referred to as a post-medium device.<sup>2</sup> This means that with the computer we can create sounds that do not reveal their source in such an obvious way as for example the sound of a violin points to a stringed wooden sound-board played with horse-hair. Not only does the computer offer practically inexhaustible

possibilities for the creation of sounds, it also enables the artist to artificially add layers of associative meaning to sounds that point beyond their immediate sonic condition. To give a simple example, the Scottish electronica duo *Boards of Canada* early on specialized in the use of sounds that evoke a nostalgic "retro" atmosphere. This is achieved by manipulating sounds to give them a sort of "patina" that makes them sound old. Post-medium devices make it possible to artificially create or at least apply such patinas and add them to any sound.

Such additions of extra musical references constitute a level of musical organisation which is not accessible to instrumental composition in such a nuanced way. When compared to traditional categories of musical organisation, a reflected application of sounds with referential qualities opens a whole new way of thinking about sound and its organisation. This is something which has already for quite a while been embraced by video artists<sup>3</sup>, sound artists<sup>4</sup> and pop musicians<sup>5</sup> but which is only slowly finding its way into the discourse of more academic electro-acoustic music.<sup>6</sup> In the latter, associative listening processes have so far mainly been discussed as the enemy of the aforementioned Schaefferian *reduced listening*. For a full assessment of the artistic potential of sounds' extrinsic qualities, a thorough understanding of the various forms of inner-hearing processes can provide a fruitful point of departure.<sup>7</sup>

<sup>1</sup> Schafer, Raymond Murray, *The Soundscape*, Rochester: Destiny Books, 1977, p. 111

<sup>2</sup> See: Barbanti, Roberto, *Les Origines des Arts Multimedia*, Nîmes: Lucie editions, 2009

<sup>3</sup> For an analysis of Bill Viola's use of sound in some of his video installations, see: Rogers, Holly, *Visualising Music*, Saarbrücken: Lambert Academic Publishing, 2010, p.144-191

<sup>4</sup> See: Labelle, Brandon, *Acoustic Territories/Sound Culture and Everyday Life*, New York: Continuum, 2010

<sup>5</sup> See: Diederichsen, Diedrich: "Drei Typen von Klangzeichen" in: *Sound Studies: Traditionen – Methoden – Desiderate*, Schulze, Holger (ed.), Bielefeld: Transcript, 2008, p.109-124

<sup>6</sup> More recently such an approach has been discussed for example by James O'Callaghan in: O'Callaghan, James: "Soundscape Elements in the Music of Denis Smalley: negotiating the abstract and the mimetic" in *Organised Sound* 16(1), Cambridge University Press, 2011, p.54-62

<sup>7</sup> several writings by US-West-Coast composers who were involved in the World Soundscape Project are also offering a starting point. See: Truax, Barry: *Acoustic Communication*, Norwood: Ablex, 1984

## 8. CONCLUSION

With this paper I would like to point out that musical experience is only partly determined by the actual sound that is transmitted. Various forms of mental activities – like interpretations, remembrances, anticipations, or recognitions of intrinsic and extrinsic references – are playing as much their part in the hearing process as the sonic condition of the sound. The artistic application of referential qualities to sound is something what is especially relevant for, and applicable in electro-acoustic music. Even though it has already been explored and applied, theoretically it has not yet been fully assessed and reflected. A thorough analysis of inner listening processes would be a good starting point. Even though we have seen that musical experience is possible without the occurrence of any sound at all, it would be questionable to conclude that music generally does not rely on acoustic vibration. However, it does not depend on it in such an exclusive way as it is usually assumed. Inner hearing processes are abundant and they do not fully depend on sonic stimulation. Therefore we never hear only what the ear perceives.

From this perspective a number of other interesting questions emerge, as for example a definition of music that accounts for the fact that music is not necessarily sonic. Already more than 50 years ago Robert Ashley wrote:

It seems to me that the most radical redefinition of music that I could think of would be one that defines ‘music’ without reference to sound.<sup>1</sup>

Hence, the idea of music as something that can be sensed and experienced without being audible is not new at all. In fact, it is as old as the culture of Western music. With the concept of a *Harmonia Mundi* the Pythagoreans introduced a model of thinking about sound where the musical experience does not rely on its acoustic

presence.<sup>2</sup> An inter-sensory and inner-sensory conception of music was therefore placed in the very cradle of Western culture.

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<sup>1</sup> Quoted from: Nyman, Michael, *Experimental Music*, Cambridge: Cambridge University Press, 1999/1974, p.11.

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<sup>2</sup> Haase, Rudolf, *Geschichte des Harmonikalen Pythagoreismus*, Vienna: Verlag Elisabeth Lafite, 1969