Absences Within And Surrounding Light-to-sound Translations

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ABSTRACT

Within the material-immaterial dichotomy structuring the creation of media artworks and its inherent informational aesthetic, one may observe fractures or continuities. Considering media artworks through the notion of translation of materialities, the aim of this paper is to analyse some of the multiple roles that absence play within and surround this sort of aesthetic experimentation. The discussion is unfolded through the articulation of Vilém Flusser's media theory – namely considering the zero-dimensionality of electronic and digital media and the concept of *Mediumsprünge*. These concepts are exemplified through historical and contemporary media devices and artworks technically based on light-to-sound translations. The discussed examples were partially selected from references and methodological tools used in a cross-disciplinary practice-based PhD research on photosensitivity in relation to media history and media art history conducted between 2014 and 2018. The methodology combines a historical and analytical approach, through new materialism, media archaeology, cultural techniques and second-order cybernetics. The significance of the discussion is exposing both the artistic freedom (or emancipation) and the arbitrariness (and responsibility) implied in bridging the gaps involved in media artworks.

KEYWORDS

Absence; Zero-dimensionality; Black box; Translation of materialities; Media artworks.

1 | INTRODUCTION

It may be a symptom of the current era of excesses that I, as media artist and researcher, felt attracted to look more carefully at empty spaces, absences, lacks, null and voids, zero and other related concepts. The nothingness these terms suggest is a fertile terrain for analysing the material-immaterial dynamic and other structural dichotomies involved in the creation of media artworks.

From the invention and assimilation of the absential elements, such as zero in history of mathematics or the lack in psychology, emerged a cultural revolution. How does this revolution resonate in the arts? Focusing on layers of absence within and surrounding media artworks technically based on light-to-sound translations, this paper links the technical, aesthetic and existential issues related to the discussed cultural objects.

For that, the conducted discussion is divided into three following parts: (1) Explanations on the foundations of the zero-dimensionality of electronic and digital media, as pointed by media philosopher Vilém Flusser; (2) clarifications on the notion of translation of materialities; and (3) the analysis of historical and contemporary media devices and

artworks, from which the role of absence is unfolded in its multiple aspects.

2 | ZERO-DIMENSIONALITY OF ELECTRONIC AND DIGITAL MEDIA

The zero element has been considered as the midwife of modern science. Its role as a placeholder has revolutionized mathematics and its derivative technological environments (Seife, 2000). Besides the development of the Boolean logic and the binary code (Deacon, 2012), the protagonist role of zero is far beyond the assumption of the presence of an absence and is a key element to proceed with operations such as counting, calculating and computing, so as the decision taken afterwards (Baecker, 2000).

One can associate Vilém Flusser's concept of the zero-dimensionality of electronic and digital media as a fundamental condition to simultaneously address the technical specificities and aesthetic possibilities of media artworks. The manipulation of matter at the atomic level is the scientific ground of Flusser's media theory that places media development in the history of culture as part of a history of abstraction. According to Flusser, history can be divided into four gestures of abstraction. The first human gesture was to abstract time, transforming the world into circumstance: a three-dimensional experience. Later, circumstances were abstracted into scenes, images, two-dimensional representations. The third gesture consisted of abstracting images into texts, which gave birth to history and linearity, the one-dimensional experience. Last, the linearity of texts was abstracted into numbers and calculations: the zero-dimensionality of electronic and digital media and their software (Flusser, 2008, pp. 16-19).

Considering the materiality of contemporary media devices and artworks, Flusser's perspective suggests that is possible to observe the explorations of organic and man-made elements through a lowest common denominator: electric current. This condition is the basis to discuss the informational aesthetics of media artworks through the notion of translation of materialities.

3 TRANSLATING MATERIALITIES

Either from a technical or a philosophical perspective, artworks can be generally considered as a translation process, by means of materializing sensations and thoughts into space-time based configurations in order to trigger new thoughts and sensations. Portuguese poet Fernando Pessoa's sensationism theory recapitulates the essence of both creative and aesthetic reception processes through the following circular set of statements:

> *"(1) Every object is a sensation of ours; (2) Every art is a conversion of a sensation into an object; (3) Therefore, every art is the conversion of a sensation into another sensation"* (Plaza, 2003, p. 11)[1].

As Pessoa's statement demonstrates, this proposition is not new within art, and it provides a valuable clue to address the transducing process occurring among artists, (media) artworks and audience. By merging mankind's sensuous and cognitive abilities, it acknowledges the protagonist role of sensitive structures for communication to occur. Sensitive elements are the material gates transducing physical phenomena into information – abstract and potential entity that may be embodied and assimilated in a variety of other physical forms (Simondon, 1958).

Regarding the transducing characteristic of sensitive structures, one may consider media development as translations of materialities. In this sense, one should also consider that the increasing complexity of the techniques used in media artworks demands proportionally increased attention to steering these translational processes. It is required a conceptual framework able to deal with the material-immaterial dynamic of media artworks, what for me became possible through the articulation of ideas from cybernetics, from the work of the philosophers of technology Gilbert Simondon and Vilém Flusser.

Swiss scholar Rainer Guldin (2010) relates Flusser's theory of translation from the 1960s and his media theory from the 1980s. Together with the perspective on the cultural escalation towards abstraction, Flusser has developed the concept of *Mediumsprünge*, understood as the act of jumping from one medium to another, from one logic system to another (Guldin, 2010, p. 166).

Flusser's conceptual framework addresses crucial points for understanding electronic and digital media and their specificities. The possibility of gathering all materialities under an abstract lowest common

denominator of numbers and voltage changes, and, in a second step, transforming them into other possible materialities, makes the practice of media art as an interplay between layers of abstraction and concretization. The zero-dimensionality of electronic and digital media allows media artworks to be formed by programmable complex technical ensembles – combinations of an immense variety of sensors and actuators –, whose functions and behaviours can be infinitely reprogrammed.

By viewing the creative processes of media artworks as processes of the translation of materialities, I call attention to the confluence of material and linguistic turns. Artists can experience the possibility of programming and editing matter by transforming one type of physical or chemical stimulus into another. Through an expanded notion of language (Krippendorff, 2011), this practice boosts the essential artistic impetuous towards non-trivial articulations of objects and their relationships, creating situations in which meaning emerges from the communicative experiences rendered by the specific combination of technical ensembles (Gumbrecht, 2004; Simondon, 1958).

4 ABSENCE AS CREATIVE MATTER: FROM ZERO-DIMENSION TO PRESENCING ABSENCES

In relation to sensitive structures, along both the emergence of physiology as field of study (Crary 1990) and the creation media devices, one can observe the paradox of simultaneous movements towards fragmentation and continuity. Fragmenting the senses and constructing media devices is among the human efforts and attempts to objectively understand natural phenomena. In Simondon's (1958) terms, this tendency corresponds to the individuation processes. Individuations or fragmentations, in turn, constantly create a series of chasms among the parts of every system being analyzed. The created voids generate potential energy that may trigger transduction processes, altering the initial state of the systems. In this sense, the transformative quality of transducing comprehends the movement upon filling out the created gaps, stimulating paradox- and cyclically the opposite movement towards continuity.

While jumping from one logic system to another, media artists as translators of materialities deal with the gaps found in-between the systems in their multiple dimensions. These gaps demand to be qualified, or they may be operated, as the zero in mathematics, as placeholders for enabling the articulation of other elements in play.

Media artworks are based on generating communication channels able to bridge both the void between individuals as closed systems and the gap that human sensorial-cognitive apparatuses present in relation to the surrounding environment. In the coming sections selected media devices and artworks based on light-to-sound translations exemplify what is here suggested.

4.1 SELECTED CASE STUDIES IN AUDIO-VISUAL MEDIA HISTORY: ABSENCE AS A LACK IN SENSORIAL EXPERIENCE

The modes of operation of the human sensorial-cognitive system have been a central reference for the creation of media apparatuses in the history of technical culture. In this process, absential phenomena played a significant role.

A popular example of absence as creative potential in audio-visual media history is connected to human endeavours towards verisimilitude, culminating in the development of sound-film. Media historians who study sound in cinema betray a sort of ocular centricity in their narratives on the relation between image and sound in cinema history. Nevertheless, "*as long as cinema has existed, sound has been part of it – both in its presence and in its absence.*" (Beck, 2011, p. 64) The first so-called silent films were, from the beginning, accompanied by music performed by musicians who also used to create live sound effects, a possibility that was later enhanced by the inclusion of pre-recorded sound effects. However, the insertion of sound in the material film itself revolutionized the cinematographic industry and its expressive language. The absence of sound in cinema annoyed those who sought to use cinematographic language as a means to achieve complete audience immersion, providing the most 'real' experience, in short, an experience that more closely fits how the human sensorial apparatus enables one to perceive the surrounding physical world. If immersion is considered as the full involvement of the spectator's senses, the film experience remained incomplete, even if a live musician or orchestra accompanied the film exhibition. With the liveliness of theatre as a reference, the absence of human voice [2] and other diegetic elements impeded higher verisimilitude.
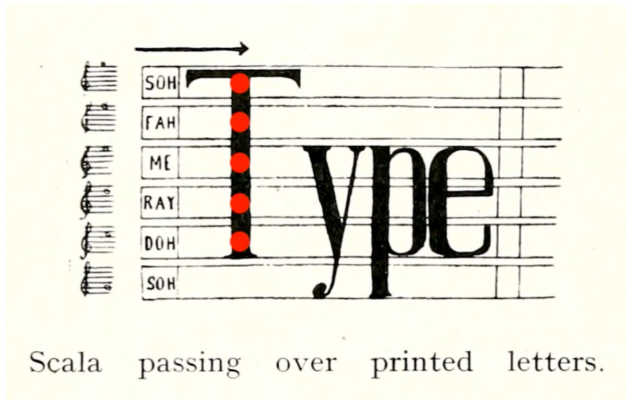
Figure 1 | Schema of how scanned characters were translated into acoustic tones in Fournier D'Albe's optophone.
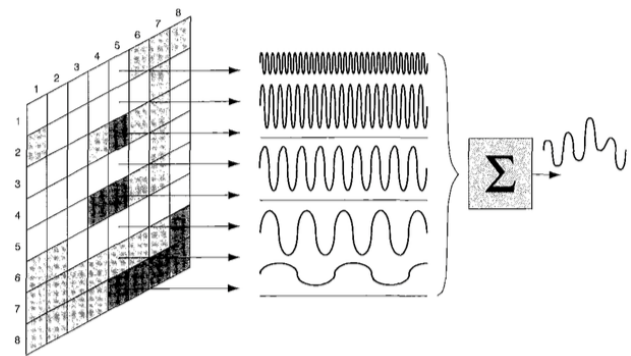

Figure 2 | Simplified schema of a light-to-sound translation using pixel based image sensor: Peter Meijers' optophone patented by Philips in the Netherlands.

Scientists and technicians across the globe have worked on finding solutions to this "problem" and invented sound film. In this media technological race, one of the protagonists was the photosensitivity of the chemical element selenium, discovered in 1817 by the scientist Jöns Jakob Berzelius (1779-1848).

The first experiments on the applicability of selenium's photosensitivity in mechanisms able to translate light into sound also investigated solutions to deal with the absence of vision. As an enthusiast of selenium's wonders and fascinated by the possibilities for converting light into sound (and vice-versa), the engineer Edmund Edward Fournier D'Albe (1868-1933) developed a version of an *Optophone* in 1912 as a means to aid visually impaired people with orientation in their environment and reading (Fournier D'Albe, 1924, p. 32). The device thus belongs today to the heritage of blindness and the variety of technological attempts to facilitate the life of people whose bodies were not aligned with the standard media of the epoch, which constantly and emphatically stressed the supremacy of vision [3].

Indeed, the development of media devices is vigorously based on adaptations to the limits of the human sensorial systems and the corresponding endeavours to extend, assist, enhance, and/or adjust or modify them. While mostly oriented by a normative perspective, discourses and devices do occasionally emerge that use deviation as a means toward innovation. An instance of this is the *Optophone*, which remains an inspiring source for artists and scientists.

As demonstrated in Figure 1, media archaeologists have analysed the functional principles of former *Optophone* models (Chan, 2016). Fournier D'Albe's reading machine resembles a primitive scanning technology, in which an object as a framed field is swept by light and the luminous reflections are read by a photosensitive surface.

Considering a Cartesian plane, axis x represents the path of the light source while axis y represents the acoustic notes. For each point detected in the scanned column, the corresponding notes that formed that letter were played. Although Fournier D'Albe claimed that through his invention the "*reading problem of the blind was completely solved by means of selenium*" (Fournier D'Albe, 1924, p. 94), the resulting combination of musical notes as feedback can still make it hard to properly distinguish each character, which probably contributed to the unsuccessful commercial lifespan of the device.

The implementations of selenium were followed by the discovery of semiconductor materials that enabled the development of image sensors, e.g. CMOSs or CCDs, which are nowadays embedded in digital cameras. As exemplified by Figure 2, they constitute the technical basis of contemporary attempts to use light-to-sound translations to develop assistive technological devices (Capp and Picton, 2000).

Finding and establishing these correspondences is termed by scholars as image-visual to audio-auditory mappings, which necessarily presupposes an image encoder and software implementing methods to detect objects from the background of the visual scene. Currently the challenges faced in this research field are concentrated in finding useful correspondences between visual and auditory stimulus that are more intuitive for users.

In a case of the mapping method reported by Matta et al. (2005), for instance, the images are transformed into a multiplexed auditory representation in which every frame is sampled, digitized and stored as a pixel matrix. Rows and columns of each matrix are individually averaged and the mapping translates the vertical position into frequency and horizontal position into time delay, while brightness is translated into amplitude. The mapping method suggested by Matta et al., however, since it also uses the image depth, becomes slightly more complex: Motion is translated into frequency shift (simulating the Doppler effect); brightness into pitch; space into amplitude, reverberation, azimuth and elevation; and edge into duration. Although scientific efforts have aimed to find solutions that users could effortlessly adopt, scientists have been forthright in acknowledging the arbitrariness behind their inventions and have made it clear that the systems they develop require extensive training by the users, who have their own perceiving and learning idiosyncrasies.

Regarding light-to-sound translations in the Arts, Berlin Dadaist Raoul Hausmann also envisioned developing and patenting an *Optophone* (Donguy, 2001, p. 217) at the beginning of the 1920s. Though less known for his difficulties in obtaining scientific legitimacy for his ideas than for his photomontages and poster poems (Donguy, 2001, p. 217), the artist left a curious multifaceted scientific-artistic legacy, including what he called an *optophonetische Weltanschauung* (optophonetic worldview). Hausmann's theory aimed to harmonise cosmologic processes, modern media technologies and human life (Niebsch, 2013, p. 19), and his propositions were clearly attempts to push the limits of the scientific and technological discourses to a symbolic and aesthetic level beyond the former utilitarian uses imagined for the *Optophone*, for instance. Convinced that the visual arts were saturated, Hausmann adopted destruction and recreation as his artistic method, artificially creating the absence of meaning and form that opened a terrain for him to let novelty emerge.

On the one hand, as an artist, he could play freely with the materials and techniques of his time. On the other hand, the scientific objectivism of the epoch remained sceptical of his endeavours – causing his patent applications to be rejected.

A casual look at the way artists and scientists create their light-to-sound translations induces one to perceive them as natural transpositions, as if the correspondences have always been there, and to ignore the human activity required to bridge the gap between one system and another. The arbitrariness of the established correspondences is necessarily bound to the subjectivities of those who have created them. As Wittgenstein noticed about Goethe's colour theory, such colour-to-sound associations are due more to the psychological than the physiological theories. Fournier D'Albe addressed a similar issue by calling light-to-sound conversions symbolic rather than actual, while revealing the problem of the great physical disproportion between the range of frequencies of light and sound waves:

> *"Light-waves are from forty thousand to seventy thousand to the inch, according to their colour. In duration they are even further apart. If we could slow down an average light-wave until it took one second to pass us, and could slow down an average sound-wave in the same ratio, it would take no less than two hundred million years to pass by!"* (Fournier D'Albe, 1924, p. 90)

Within Fournier D'Albe's trial of an objective consideration of the problem one must also notice that his premise of an 'average wave' only makes sense in relation to a specific frequency range, namely, the spectrum that humans can perceive. Such pseudo-objective positions reflect the constant attempt to define a 'standard human being' and the notion of normality, which frequently is not compatible with the specificity of each being.

4.2 *I/VOID/O*: A STRUCTURAL ABSENCE

The absence of an element to be perceived, as an assessment of a difference or as result of a counting process, depends on an observer. Without the observer, there is no zero or absence (Baecker, 2000) and this realization also evinces the gap found between object and observer. This phenomenological gap is the key to address what here is termed 'structural' absence.

Figure 3 | Set up of the installation *I/VOID/O* by Sandro Canavezzi de Abreu.

The mergence of the gaps found in both between the systems in translation and between object and observer is materially and metaphorically expressed in the installation *I/VOID/O* (2002-2010), by Sandro Canavezzi de Abreu, in collaboration with Daniel Barreiro, who designed the soundscapes. This installation is the last and interactive version of an aesthetic investigation that started with the following imaginary situation: What could one see if located inside a completely mirrored sphere? The installation and the whole creative process is depicted and analysed by the artist in his doctoral thesis (Canavezzi, 2011), who built the mirrored sphere embedding inside four cameras: one is movable while fixed at the tip of a stick to be manipulated by participants; other two are linked to produce stereoscopic images, and a forth that is fixed in attempt to capture an objective observation of what happens inside the infinitely reflexive black-box (Barreiro et al., 2009). A version of the installation's set up can be seen at Figure 3.

Using a robust list of equipment, the mechanism of the installation consists of translating light into "*discrete parameters that change the behaviour of both sound and image in a continuous and vertiginous 'loop'*" (Barreiro et al., 2009, p. 129). From this technical basis Canavezzi programmed a series of modes of interaction exploring what he calls "cognitive friction", to be generated through the spatial paradoxes actualized along the interaction.

Observing the multiple levels of the light-to-sound translations in *I/VOID/O* and their corresponding interaction design, the void found between input and output has been filled out with real-time audio synthesis and sound processing techniques, such as granular and additive synthesis. According to Barreiro et al. (2009), the patches made in Max/MSP have often been structured in random data generators, selected empirically by the involved artists through their subjective preferences.

The simultaneous freedom and arbitrariness involved in the creative process is the potential energy that makes the powerful role of absence in the creative process of media artworks. The infinite possibilities of choices to be programmed in the zero-dimensional gap between light and sound, as materialized at *I/VOID/O*, attest the emancipation of photosensitive device (camera) in relation to visuality. Profiting from the zero-dimensionality of electric changes inside the camera image sensors, the same data input may output visual and/or sonorous images.

4.3. SELF-TRANSLATIONS: EXISTENTIAL ABSENCES

It is also possible to push the structural absence addressed in *I/VOID/O* to another level, by means of shortening the distance between artist and artwork. Media artworks in which the artist investigates a personal physical absence to explore its aesthetic potentialities may lead to the comprehension of existential absences.

The case of the eyeborg Neil Harbisson also encompasses the issue of light-to-sound translations. Harbisson's artistic statement is very close to that of Hausmann's optophonetic worldview and the ambition of enhancing human perception through the development of new media. Inspired by his congenital achromatopsia and in collaboration with Adam Montadon, Peter Kese and Matias Lazano, Harbisson (2012, 2013) has worked on the embodiment of a device that translates the colours captured by a photosensitive sensor placed in front of his head into sound. Harbisson reports that since the last update of the device, his perception of sound occurs through a direct connection with his skull, which has given him the new sense of "hearing colours", a synthetic synesthetic experience that can be also understood as a process of translating materialities.

The existence of colours for human vision is the result of light-matter interaction, conditioned by the triadic material composition of the cones [4], which are photoreceptors that form the retina together with the rods (Guyton and Hall, 1996, pp. 577-589). This basic physiological principle of human vision harks back to Isaac Newton's experiments in 1666, showing that white sunlight is not a single entity but a spectrum of infinite colours. Hausmann's concerns expressed in his texts about the *Optophonetische Weltansachuung* also address the different theories of colours developed by Newton, Helmholtz's and Goethe, revealing an attempt to merge the objective and the subjective aspects present in the dominant discourses of his period.

> *"The eye connects space and brain through a subjective-optical creation to the temporal world-view, to an intuition of light, called optics. We do not see any light, we see colours."* [5] (Hausmann, 2013, p. 76)

Today, considered as an electromagnetic radiation with wave-particle properties, the light-colour relationship is the basis of the measuring parameters commonly used both in scientific and aesthetic investigations. When isolated, the energy of a monochromatic beam of radiation is related to its wavelength and frequency. The subjective perception of colour, however, is not evidence of its supposed immaterial condition (Pedrosa, 1977), as some theoreticians defend. Looking more closely at light sensitiveness and the molecular structure of pigments, one finds a material condition enabling colours to be seen or not (Guyton and Hall, 1997, pp. 577-589). The absence of specific material conditions within Harbisson's retina is the reason for his achromatopsia.

According to the artist, he was used to ignoring or avoiding colours in his everyday life until the moment he discovered studies relating colour frequencies to sound frequencies and felt motivated to investigate how he could perceive them. Ever since, his previous attitude of neglecting the absence has been transformed into a series of creative projects. Although Harbisson does not provide information on how he developed his own relations between colours and musical tones, he has published what he named *sonochromatic* scale.

General methods for the sonochromatic music scale consist of microtonal and logarithmic scales with 360 notes in an octave, with each note corresponding to a specific degree of a colour wheel ranging from the pure colour to white, the maximum brightness. In contrast, Harbisson's sonochromatic scale is a non-logarithmic scale that includes infrared and ultraviolet, discards colour as being part of a colour wheel and ignores conventions on musical perception in order to overstep the limits of human perception.

The search for correspondences between colour and sound seems to be an inspiring field of exploration for artists, as further historical examples demonstrate, such as the *Projet de clavier ultrachromatique* (1943) by the composer Ivan Wyschnegradsky and the cybernetic *Musicolour* machine (1953-1957), by Gordon Pask (1928-1996) and Robin McKinnon-Wood (1931-1995) (Rosen, 2008).

Since the translation from light to sound has been technically and aesthetically explored and discussed in a variety of forms, wherein lies the novelty and power of Harbisson's work?

On the one hand, it relies on the technical audacity to embody a hybrid version of what the classic references have proposed. The automatic response of the system embedded in Harbisson's body, translating luminous stimulus into vibrations, has led to a self-organizing arrangement. Self-organizing principles were already very present in almost all Pask's artworks, but in Harbisson's case biological and machinic systems were merged in the artist's own flesh. He states that he is technology, since a cultural object and its abstractions (encapsulated knowledge through codes) are attached to his body, forcing a new stage of organization upon itself. On the other hand, what has substantially empowered his body experiment and its derivative artistic propositions is his wager on the creative use of absence. He approached his colour-blindness in an innovative manner, giving place for the aesthetics of disability to flourish.

Furthermore, by corporeally experimenting with processes of translating materialities one comes into explicit contact with the necessary betrayal and loss of information; however, it has still been a valuable exercise leading to a heightened awareness of gaps as creative sources, as open spaces for the emergence of novelty.

Stressing the imaginary and symbolic layers of an absential phenomena, in the performance *Self-portrait of an absence* (2016), I aesthetically explored the fact that I have a blind eye. The work consists of an eye-tracking device programmed to generate sounds according to the synchrony-asynchrony of the eyes' movements. By offering a promenade under an umbrella for two people, I invite the participants for an observing-listening exercise, guided by the possibility of distinct sound modes.

Being monocular implies a reduced field of vision (circa 25%) and the inability to see media-based stereoscopic images. I am frequently asked if I can visually perceive depth and how it works. Other often questions relate to how blindness looks: Is it totally black? Totally white? And people generally become intrigued when I say there is nothing. It is absent (Lautenschlaeger, 2018). To the contrary of what people usually think, monocular people do see depth, because there are many other elements in the one-eye image (texture, perspective, etc.) informing the body of the three-dimensionality of the world, together with retrieved information from the other senses – especially from tactile and auditory senses – that is all interrelated in the brain.

The coincidence that Vilém Flusser, the "philosopher of the black-box" also had this partial absence of vision [7] motivated me to create a concrete dialogue with his work, particularly through the notion of *Mediumsprünge* and his philosophical method as self-translator (Guldin, 2013). As an exercise in playing between the abstract and concrete worlds of codes and materialities, the performance *Self-portrait of an absence* (2016) started as a poetic experiment on the search for the possible paths between sensing and making sense, by means of the confrontation between organic and machinic light-sensitive elements, an eye and a camera. Eye and camera are black-boxes in the literal sense, but they also became epistemological objects for me in a second-order cybernetic perspective, both in the performance and in my PhD thesis (Lautenschlaeger, 2018). Light-to-sound translation has been the means of presencing an absence.

Facing the absence of the abyss between one system (light stimulus) and another (sound output), Harbisson's case and *Self-portrait of an absence*

exhibit the freedom to create new correlations from inexistent ground. The interstitial zone of the absence is, in this sense, a fertile field of indeterminacy, in which artists can attribute and manage meaning from nothing. Experiments such as these challenge the historical dichotomy between form and function attributed to the eye and camera, a revolution facilitated by the development of electronic and digital media and its zero-dimensionality.

Lastly, using one's own body and disability to query the notion of normality through art is a second-order cybernetic approach that allows the coincidence of both types of absences: a physiological and an existential one. In an analogous way to how Flusser used translation and retranslation processes as philosophical tools (Guldin, 2013) to react against the absence of meaning in life, media artists can wear similar lenses to exercise and create more meaningful artworks. Artworks and life are matters to which meaning can be attached.

These examples demonstrate that the contemporary attention to absence, including in media artworks, is not detached from a psychoanalytical dynamic, as articulations of the presence and absence in the imaginary, symbolic and real orders, as proposed by Jacques Lacan (Boothby, 1995).

5 | CONCLUSION

The translation of materialities relies on many in-between layers of abstraction (models and systems) between input and output. Manipulating matter through the zero-dimensionality of electronic and digital media potentially increases the number of abstract layers, which also leads to an increase in the level of complexity.

The structural absence proposed in *I/VOID/O* is an example of how the zero-dimensionality of digital media and the inherent possibility of translating materialities ground both paradoxes: the zero-infinity and the freedom-arbitrariness. These paradoxes challenge the relationships between form and function, as expressed in the different transductive 'black boxes' addressed along the article.

In the case of *Self-portrait of an absence*, light variation entering the camera is captured and turned into data on the eyes' movements. The difference between the movements of the eyes becomes relevant information that will later be converted into

sound. Alterations in the material's resistance resulting from the interaction of light and matter [6] in the camera's image sensor constitute the zero-dimensional matter (or data, as some might prefer to term it) that enables light input to be directed and transformed into another physicochemical stimulus. In the specific context of the performance, when the light beam entering the eye and the camera is translated into sound in the vibrating membranes of the loudspeakers, a new meaning is attributed to the technical ensemble being used.

In Harbisson's case, light variation is decomposed into luminance and chrominance to form a colour system, and only then does it emerge as relevant information (defined by the artist) to be further codified as sound. These processes are here described in a very briefly, but every step taken in programming matters, and meanings, from input to output and their circularity, can be decomposed into several layers of abstraction – variables, functions, protocols, etc. This marks one of the main problems of translatability when the notion of translation is implemented in relation to physicochemical phenomena.

In this sense, Flusser's *Mediumsprünge* concept suggests an understanding between material-oriented approaches, expressed for instance in Kittler's idea that "there is no software" (1995), and concept-based approaches, such as those able to consider software and coding as "the technique of providing a dynamic background to control the automatic evolution of meaning" (Goldsteine and von Neumann, 1947, apud Chun 2011, p. 25). Through the concept of *Mediumsprünge* Flusser combines discourses from linguistic theory, information theory and arithmetic thinking (Guldin, 2010, p. 168) and affirms that distortions are unavoidable in the process of jumping from one logic system to another. Nevertheless, he postulates that distortion, or deviation, can be compensated by the benefits of new information, novelty and innovation – this is precisely what one can learn from the absential spaces found in translation processes.

This approach may be useful for media artists, who constantly face the challenge of creating artworks that do not depend on parallel explanations and permit access to the abstract operations that they are mobilizing.

By self-translating in the artistic context of programming matter and meaning, the inherent immaterial and material contiguity of cultural and artistic artefacts evolve into a human existential issue. With the possibility of self-translating, media artists manage to overlap and unite object and subject, elucidating the continuity of communication between organisms and machines.

While transcending the stigma of absence as limitation and using it creatively, Neil Harbisson and *Self-portrait of an absence* are transgressive acts of self-translation that place the initial repression of standardization as a secondary and diminished problem. They spontaneously join the aesthetics of disability, comprising the refusal of "*harmony, integrity, and beauty – as the sole determination of the aesthetic*" (Siebers, 2006, p. 64).

In conclusion, far from recommending the management of the audience's sensorium and cognitive apparatus through aesthetic experiences, translating materialities is a conceptual strategy to nurture more awareness about the void between the two sides of the systems undergoing translation. This perspective calls for the invention of interesting new bridges; bridges substantially grounded on the specificities of the contexts being correlated – the systems in translation and the absences themselves.

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ENDNOTES

[1] From the excerpt in Portuguese: "1. Todo objeto é uma sensação nossa. / 2. Toda arte é a conversão de uma sensação em objeto. / 3. Portanto, toda arte é a conversão duma sensação numa outra sensação".

[2] This is the reason why sound-film is also called "talking-films".

[3] In *Techniques of the observer* (1990) the art historian and critic Jonathan Crary developed a deep analysis of how optical media have contributed to the abstraction of vision and the formation of visual-based consumers since the 19th century.

[4] Cones are classified into three kinds of cells, each type responding to visible light of different wavelengths on the electromagnetic spectrum. Long cones respond to light of long wavelengths, peaking at the colour red; medium cones peak at the colour green; and short cones are most sensitive to wavelengths of the colour blue.

[5] From the original in German: "Raum und Gehirn verbindet das Auge durch eine subjektiv-optische Schöpfung zum Zeitlichen Weltbild, zu einer Anschauung vom Licht, Optik gennant. Wir sehen kein Licht, wir sehen Farben." (Translated by the author)

[6] On Peter Sloterdijk's article on light and resistance one can find similitudes between his and Flusser's perspective on the interplay between material and immaterial layers of cultural objects, so as to its accompanying fragmentation process, in with each using the same metaphor of a blade: "Der Mensch ist ein Tier, das schneiden kann". (The human being is an animal that can cut") (Sloterdijk, 2015, p. 40, Translated by the author).

[7] According to Guldin, with the II World War outbreak, Flusser was dismissed by the Czech army because he had a blind eye (Guldin, 2010, p. 164).

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