The breaking-continuity paradox in artificial vocality aesthetics

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***Abstract* — The first part of this paper shows the cutting and centrifugal force of the technosciences, by taking support on some examples drawn from the field of vocal music. The questioning on the traditional nomenclature of voices and the intrinsic heterogeneity of the increased voice are characteristic of this shattering of the usual aesthetic references. The second part will explore a direction tending, *a contrario*, to mix various musical aspects in a single perception. Thus, various acoustic parameters control the ones by the others, aesthetic dimensions belonging to separate artistic fields are meeting together. This paradoxical connection currently seems to lead to a renewed reading of the aesthetics of contemporary arts in the light of the technological repercussions.**

Keywords: voice, artificial vocality, aesthetics, hybridization, interartistic

I. INTRODUCTION

Since the middle of the XXth century, the links between artistic expression and technology have become increasingly frequent and are gradually tightened, as well in sound arts as in visual arts. The consequences are numerous, as well for creators as for the audience. If multiple works question the arts aesthetics implying technosciences, an important paradox is still not very often explored. Technologies indeed cause at the same time a deep change of art by the bursting and the loss of the traditional reference marks, but they also create new continuities and new orientations in the art works aesthetics in the XXth and XIXth centuries.

Artificial vocality, as transformed or synthetic voice, is the place where contradictory forces interact between the intimacy of the subject's flesh and the object externality, free from feeling, between the expression of oneself, so difficult to define, and scientifically calculated material fitting.

A double movement can be distinguished: on the one hand the dissolution of the word, the questioning of traditional classifications of the sung voices and a splitting of the vocal organ by the addition of a technological device, on the other hand the setting in continuity of variables formerly clearly differentiated or discontinuous, and a hybridization obviously increasingly generalized. The contradiction between decomposition/recombining contained in the artificial vocality also reveals the same contradiction present overall in modernity.

II. FRAGMENTATION

The artificial vocality, and more generally the sound textures obtained by electroacoustic means, are the stake of a multiple bursting which contributes to upset the appropriation of voice and language by the composers. It is then impossible for them to preserve the same reference marks and similar techniques of writing. The definitions and categorizations, the base of any reasoned way, musical or not, are deeply called into question.

A. Calling traditional typology into question

The usual classification of the voices is based directly on the vocal organ physiology of singers. If it is justified when the natural voice is convened without associated electroacoustic device, it is different in the contrary case. But the technological devices implemented resist a simple typology, especially if writing techniques and sound result are evoked.

1. Artificial vocality

So, two vocal groups seem easily differentiable in artificial vocality, if not from a perceptive point of view, at least on the generative side: transformed natural voices and synthetic voices. The first group, far from completely evacuating the complexity of the voices traditional classification, adds new problems, that of technology, making classification even more hazardous. The second can subdivide itself into two parts.

On the one hand, the voice is not an instrument manufactured by the hand of man, it is not defined by construction. But, for a reciprocal reason, technology in itself can give place to a precise classification by material solutions, software, adopted concepts and methods. The difficulty lies then in the correspondence between this classification and auditive perception.

The relevance of such a classification also runs up against the fast evolution of technologies and used concepts. The increased voice is exemplary by a certain number of these concerns while gathering what seems irreconciliable: the existential mystery of the individual and highly sophisticated instruments.

B. Physical disjunction of the increased voice

The voice handled in real time breaks the direct link which is established between the vocal organ, the body and the flesh of the singer, and the ear of the listener. A representation method replaces the acoustic way of relation without the intermediary of the live spectacle. In an opera hall, the body of the singer involves pressure variations of the air which surrounds it, variations which are propagated in complex manners gradually in the hall until reaching the tympanums of the public. Only relative positions of the singer and the listener, and the acoustic properties of the room including the audience, can modify the perception of a given voice.

1. First breaking

A first breaking appears as soon as dimensions of the room impose an amplification of the singer voices. The listeners no longer hear the voices directly, but the sound diffused by the loudspeakers. The great quality of the used systems does not change anything with reality of this disjunction. This fact extends not only to the act of singing in front of a simple microphone with an aim of amplification, but to all the possible relations between a voice, or more largely an individual, and a technological device. As Annick Bureaud points out in connection with artist installations,

> "contemporary technology is not the prolongation of a particular meaning but a new skin through which we feel, we breathe, we touch, we live. This new body covers the old one like a sediments layer. At the same time with an increasingly large abstraction and immaterialization, the reinvolvement of the body in the experiment appears similar to that we have of "reality"." [7]

2. Second breaking

A second breaking arrives when the electronic device modifies the voice by the will of the composer. In this case, the voice becomes an instrument including an increased body part by a technological device. Moreover, if the composer can modify the vocal body of the singer during the spectacle, nothing prevents him/her from conceiving a variability of the treatments of the voice. The voice is not only no longer incarnated, it is materialized. And this materialization can include a part of programming, i.e. of dynamic freedom.

3. Third breaking

Digital technologies imply a third breaking by breaking the chain of the acoustic signals or similar ones in analog technologies. Digital sampling produces numbers which give place to calculations. If the electric signals conveyed in the analog devices preserve the continuity of the parametric variations, digital technologies reduce them to series of values. They cause an intrinsic discontinuity thus. However, whatever the technology used, and as well in the increased voice as in the synthetic voice, the multiform phenomenon of complexification coexists paradoxically with a tendency to unification by various processes supporting continuity or aggregation.

III. CONTINUITIES *VERSUS* BORDERS

Many indices show with force that the introduction of technologies and machines into the creative act, the artistic object and the process of perception of the art work, was a factor of unification as much as bursting. New continuities draw a renewed artistic territory whose dividing lines do not adhere any more to the old borders. The possibilities offered by the machines do not accentuate only the crumbling inherent in modernity, they also take part in a recombining of the simple or complex elements of the artistic language like a hybridization.

In the musical world, hybridization is often reduced to the chimera from two sound sources obtained with cross-synthesis software. However, for the specialist in numerical arts Edmond Couchot,

> "digital technology […] strongly supports hybridization not only between the image components (or sound ones), but also between the artistic practices (graphic, photographic, cinematographic, videographic arts, sound arts, text arts, body arts, etc). Hence, for some people, the impossibility of seeing constitutes a really new and clearly identifiable art." [10]

This transversality, a consequence at the same time of the cultural context and of the intrinsic neutrality of the binary data, seems to induce, for the sound art, a voice/not-voice continuity, interparametric, or even interartistic continuity.

A. Voice/not-voice continuity

Spectrum formantic components of the vowels are a well-known characteristic of the scientists and composers interested at the same time in vocal music and electroacoustics. This sound world aspect should be regarded as an established fact in switching between yes or no. The formants are not compulsorily associated with the voice and they can contain an energy at the threshold of perception. The listener then hesitates to allot a sound to a voice. The border between voice and not-voice became porous.

Voluntarily maintained, ambiguity suggests a musical aesthetics all in nuances which rests on a sound continuum rather than on well defined areas.

B. Interparametric continuity

Many applications allow a very precise analysis of the formantic parameters. Thus, the analysis of the centre frequencies of the formants gives the possibility of calculating their relative positions. In *Les Chants de l'amour* of Gerard Grisey, these computed values for the 28 vowels contained in the sentence "I love you" are then integrated in the process of writing, as well as on the level of the durations as to the relative entropy of the sections. From this example, it is easy to imagine a generalization of this relationships concept to all the available variables.

C. Intervocal continuity

This acoustic data flow can also be extended to several sound files. For example, in Diphone software of Ircam, a spectral envelope of a voice can be applied to another voice or to any other signal. Calculation is carried out in differed time, but the same principle of hybridization exists for a real time cross-synthesis. Hybridization between two voices produces a third voice where certain elements belong to one or the other of the two people. A sound chimera is created and it contains elements coming from the physiology of the subjects having given

their voices. As a share of both separate personalities the voice is tinted, the expressive and aesthetic consequences prove to be important. The well-known experiment of the *Farinelli* sound track is a striking demonstration of this process.

D. Interartistic continuity

Hybridization thus extends the concept of continuity to correspondences between arts about reality and either concerning the romantic imaginary as in Hoffmann's or Baudelaire's works. Daito Manabe's performance like *Turntablism takes on the visual dimension* (2006) [21] [22], located in the current of Vjaying, or the dramatic works like *On-Iron* (2006) by Yannis Kokkos and Philippe Manoury hustle the borders between visual and music arts. The hybridization, approached not only by Edmond Couchot, but also by many authors like Emmanuel Molinet [16], Annick Bureaud [7] or Florence de Mèredieu [15] remains still an aesthetic concept especially studied in the field of visual arts.

For Emmanuel Molinet [16], the concept of hybridization exceeds the idea of loan, combinative, overlap or superposition. It generates a new coherent and completely autonomous entity from the sources which gave birth to it. Hybridization is a complex process of assimilation, even if the word is often used in the more general meaning of mixture.

Technology is thus not only a way of putting images fragments together, or of producing works integrating closely the visual and the sound parts by mutual interaction. Moreover, according to Annick Bureaud,

> "This hybridization is expressed in the nature of the art work and in the relationship which we maintain with it. Work becomes to some extent a medium for a communication between beings more than one object in itself. Materialization of the artist's imaginary by rules to be explored through, possibly, an object allows us a 'travel' in the mental structure of the other one confronted with our own mental structure, in an intersubjective discussion not mediatized by the objectivation of words and language." [7]

Often ignored by critics and voluntarily rejected by many composers, the video art sound component is not however to be neglected. Many video artists among the most important practised the music, like the South-Korean Nam June Paik, and the American Bill Viola. Paik, after studying at the academy of music of Freiburg-in-Brisgau in Germany, took part in the work of Karlheinz Stockhausen in the studio of Cologne in 1958. He also met John Cage and David Tudor the same year. An artist with exuberant visual aesthetics and true founder of the video art, he died in 2006 in Miami. Viola is a video artist with more discrete aesthetics, but also a player of synthetizer. Florence de Mèredieu, in her book *Arts et nouvelles technologies* [15], announces the first experiments of Jean-Pierre Boyer (*Le Champ Magnetique*, *Phonoptic*, *Video-Cortex*, 1973-1974) in whom the Canadian artist connects the sound in the sweep circuit of the cathode ray tube.

The cybernetic scultptures of Nicolas Schöffer in the seventies also had a sound dimension in which Pierre Henry took part. The interaction or hybridization between image, movement and sound are then developed by artists like Ziembinski and Atau Tanaka. The Tod Machover's opera, *Brain Opera* (1996), uses the Internet network for its design. Thus, technology is not only one powerful tool of hybridization between arts, but, more than one simple tool, it forms an integrated part of work.

Creators use technology as well to design works with a not very innovative language, or on the contrary with an aim of innovating as well by the tools used for the writing. Christiane Paul, in her book *Digital Art* [17], underlines for the whole digital, visual and sound arts, the difference between these two designs, regarding on the one hand the digital one as a simple tool, and on the other hand like a medium in its own right. She shows in particular that the digital medium revealed three original ideas in the artistic field: interaction in real time between the public and work, artificial intelligence producing behaviors close to life, and networks, which are local or connected to the Internet.

The first approach is not without pointing out the experiments of John Cage with analog technologies. Moreover, the performances of Laurie Anderson, sometimes close to the installations of visual artists, were carried out in the seventies within the framework of *The Kitchen* in New York. Her more recent work shows her interest for complex technologies and her relations that the human ones maintain with the machines. More recently, the artificial neural networks of the sound and luminous installation *Caresses de Marquises* realized at the railway station Gare de l'Est in Paris in 2004 by Frederic Voisin, Robin Meier and Nicolas Frize was based on various species of sound agents differentiated by their neuronal structure. The agents react at the same time to luminous projections and to the sound activity of the other agents. The formal writing is not direct any more, and thus not based on constraints imposed by interactions between digital system and the audience. The neuronal structural design, their behavior in relation to the context, goes beyond the man-machine interaction by convening a certain autonomy of the device via its agents. Another form of network is the Internet or the mobile phones network. Less known, the artistic applications of the mobile phones developed from the 2000 years in experiments of sound landscapes in network like *Telesymphony* of Golan Levin in 2001. The telephones are used via their downloadable ringing like samplers remotely controled.

In this context, the uncertainly introduced into differentiation between the object (represented reality) and the subject (people who compose, perform or listen/look at) hustle the ideas best anchored in the culture of the musicians. In the case of the increased voice, the singer no longer produces only the voice while acting inside his body, s/he "plays about it" outside in the same way that an instrumentalist plays his/her instrument. The singer of Dexter Morrill's *Sea Songs* (1995) modifies her voice in real time by ordering effects

from *Radio-Baton* built by Max Mathews. Chris Mann, in Joel Chadabe's *Many Times Chris* (2004), "influences" the instrument-voice in the same way. Moreover, increased or synthesized voice can be multiplied.

An infinity of occurrences, sometimes in network, then is potentially attached to what should be only single. And when the voice is simulated, reality does not preexist any more to what is heard. The carnal intermediary of the singer's body, the vehicle of the creator's imaginary, disappears, without throwing a direct bridge between the thought of the composer and the ear of the listener. The reciprocal contamination between art and technology introduces another solution of continuity into the chain of the artistic expression: on the one hand symbolization inherent in the transformation of the acoustic signals into electric signals and/or the digitalization of the sound, on the other hand the hardware device.

IV. Conclusion

The automatic data treatment, the cybernetics of Norbert Wiener regards information as neutral, incorporating, and being able to undergo any handling. This information can thus be split into as many entities as necessary to make possible calculations.

The digital one, which processes data with a calculation mode basically far away from the artistic expressivity and emotion, which introduces into the transmission and representation modes an uprecedented split, substitutes a symbolic relationship system from the physical communication between composer, performer and listener, or between painter, picture and spectator. The artist is thus in a different relation with the artistic sound or visual object, and the other subject for which is intended his/her art. His/her aesthetics and his/her imaginary are modified, but not only in the direction of a kind of proliferating split driving to a generalized atomization. If such were the case, the artificial vocality would be in particular an aporia figure between the human voice carrying emotion and the impersonal machine.

Actually, this vision proposing the idea of split resulting from the concept of avant-garde, itself associated with modernity, cannot mask the centripetal force of the association between arts and technosciences. It seems indeed increasingly difficult to base arts on the typologies strongly marked by the romantic and post-romantic contexts. In the same way, the artistic fields often appear to irremediably merge when computers are present. The association of various scientific or technological models implemented in many multimedia works shows how promising the concept of cooperation or fusion is. The paradox between split and continuum is solved whereas the multiplication *ad infinitum* of discontinuities finally generates continuity.

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