Music without body: composition, computers and instrumental practice

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Abstract

This paper poses a theoretical discussion upon some aspects of computers' usage as a tool for musical composition, by analyzing its consequences to the education of composers, to the musical ideation process, and to the communication of musical composers, to the musical ideation process, and to the communication of musical composers, to the audience. Computer music brought --as one of its possibilities-- the work to the audience. Computer music brought --as one of its possibilities-- the performing of music without a player. This gave the composer the responsibility of making performing decisions in the very act of composing. The authors question the possibility of an exclusively intellectual creation, generated without experiences that relate sound and body. Extremely, the actual possibility of developing a training in composition and of operating on complex musical structures, without having ever played an instrument. As a conclusion, the paper stresses the relevance of instrumental practice as a significant tool for structuring musical thought.

"...music-making -especially children's music-making- is essentially a social activity. When new technology is introduced, this social dimension can be lost -the interaction is happening between the player and the computer screen rather than between people..." (Swingler, 1994).

Introduction

This paper poses a personal view on some implications of computers' usage in education and training of composers. The authors reflect from a pedagogic point of view. One of them is an electroacoustic composer and worked on children's music initiation, the other is a music educator and a flutist, specialized in performing early and contemporary music.

The growing interest towards musical creation with digital media has originated plenty of courses and careers on this particular field. The explicit social request is towards *music-making*, but it is also possible to recognize in it the fascination of modernity and of the usage of computers, an iconic tool of our times. Curiously, such courses and careers do not pose any requirement of instrumental skills for their students. The idea of an "easy access" to music production seems to have completely discarded any training or experience on playing instruments.

The authors wonder about the following questions. Is the present trend a healthy one? Could composers' education without physical experience with instruments be a complete one? Would not be something lost? Could music ideation be a purely mental fact, without the intervention of human body, even as a memory of corporal processes implied in performing?

Or is this a retrograde position? Is this the point of view of a musician that feels his place of knowledge and power invaded by new barbarians, not knowing or valuing the traditions of his art?

Composers without body

Computers' applications in the music field have enormously facilitated the access to different stages of musical production. Nowadays, the user of a digital system, amateur or expert, can interactively operate with it for realizing musical structures. This possibility has been welcomed as a "democratization of the access to the whole musical process -for a long time reserved to a kind of specialists, the musicians" (Iazzetta, 1994).

It is far from our intentions to condemn the dissemination of music knowledge and practice. What we want to point out is that this dissemination from the standpoint of computers' usage, brought with it many implications. We feel there is not an adequate reflection on some of these implications. The tool is not innocent.

Evidently, this is an answer to the social request that we mentioned above. New users seem to be much more interested in *making music* than in *playing an instrument.* The long time needed to develop fine motor faculties and muscular skills for playing an instrument, seems absolutely inefficient to the fascination of multimedia production and to the eagerness for music manipulation without effort.

This trend has also influenced the use of computers in children's music education. Many of these experiences have reached encouraging results, but others arise doubts about the pedagogic ideology that inspire them. The need of using computers seems to be --in some of these cases-- a compulsive decision of educators or institutions. They feel that computers could be a possibility of having quick achievements, without an "inefficient" contact with musical instruments.

In the past, the realization of any musical structure implied the participation of performers. Thus, development of performing capabilities --even to virtuosity-- was a major goal of musical education.

The incontrovertible fact is that present technology has made the operation on complex musical structures without a human performer possible. Musical production can be today a purely mental fact, without the intervention of a human body. Precisely, sequencers' appeal among amateur musicians is related to the possibility of achieving musical results that largely exceed the performing skills of their authors.

Extremely, this implies the actual possibility of training composers that play no instrument, and that operate on musical structures exclusively through a computer keyboard. This situation -even when we can recognize precedents- is new in music history. Traditionally, studies on composition were carried out *a posteriori* of certain basics that included instrumental training, once students have had the experience of producing music themselves, and after having interacted with other performers.

Instruments with power supply

Electronic instruments have posed the need of developing new and specific playing techniques. By depressing the key of a synthesizer, complex processes start -for example, rhythmic phenomena--, that are only controlled in the instant of triggering them. Actions within the sound take place, without the need of any action of the performer to keep them going. This is a new fact in music history: a pianist, flutist or violinist always needed to *continue playing* if they wanted to prolong sound actions. This requirement of motor faculty of the performer was necessary, in most of the cases, to supply energy to the instrument, for sound production. At the same time, it gave the player a precise and empathic control over sound processes that were being generated.

None of this is necessary in electronic instruments. Their power supply for sound generation has a source different from their players. Complex sounds, of the kind that are common in the electroacoustic exploration, are musical processes of their own. Their development is independent of the player, because it has been programed in the very act of composing them.

We will be told that MIDI continuous controllers can give the player the control that we are lacking. Nevertheless, many of the player's physical actions over these devices have a distant relationship with the sound processes that they control. A modulation wheel, for instance, doesn't seem to be the best interface to control the amplitude or speed of a tremolo, if we compare it with the actions needed to do it in an acoustic instrument. Many times, the action modes of this continuous controllers lack an organic correlation with the sound effect that they produce.

Nonetheless, it is undeniable that synthesizers **are** musical instruments. The situation described above could be stated as an interface problem, a case of remoteness between sound processes and player actions, in a way similar to the case of the pipe organ among acoustic instruments. In any case, we can deal with the problem in terms of adaptation of the interface. We can see the growing interest towards research on control devices --even

virtual instruments-- that could use the totality of human gestures (Mulder, 1994). Physical modeling synthesizers also poses an interesting approach to a more direct and organic relationship between the performers' bodies and the sounds they produce.

But what happens when there is not even a synthesizer under consideration? When the electroacoustic composer or the student thinks of the computer as his instrument --as **the** instrument--? Is it possible for those who do not know any other way of interacting with sound than a computer keyboard or a mouse, to develop music ideation processes?

The importance of the body

Psychoanalysis have stressed the importance of the connection with sensitive world as fundamental to psychological development. Consciousness cannot develop if there is no connection with the external world. André Lapierre also pointed the close relation between the psychical and the motor faculty developments. "Only through experience... with an active participation of motor faculty, is how the fundamental structures of abstract thought can be produced". (Lapierre- Acouturier, 1977).

Music is related to body from the beginning. "Rhythm in the body is very primary, and comprises our earliest musical selves. Between four and eight weeks' development, rhythmic contractions along the spine of the human embryo begin propelling it around the mother's womb... Our oldest neurophysiology resides in our lower back, and it is musical. Rhythm is corporeal - it is bodily." (Spaulding, 1994)

Nattiez says that a minimal condition for music is sound (Nattiez, 1987). When there is no connection with the world of sound --even as a representation of past experiences-- composition is no longer an operation with musical structures, and becomes a part of mathematics. Such a case would show the aim of constructing a world of ideas, whose internal coherence do not need to be validated with anything else.

In the case of a composer trained exclusively through a screen, there is a loss of something essential, a psychical impoverishment due of the lack of experience.

Division of work

The origin of the trend that we are describing in this paper could be tracked in the past. Let's propose the following framework.

Applying Molino's ideas of semiological tripartition (Nattiez, 1987) to musical creation, we can see that any given symbolic form can be studied in connection to three different dimensions.

a) The *poietic dimension*, which refers to the process of creation of the symbolic form. This process supposes techniques, rules and strategies of production, and it is describable and can be reconstructed.

b) The *esthesic dimension*, that implies the construction of meaning in the course of an active perceptual process. Suppose perceptive strategies. "The enjoyment, the contemplation or the reading of a work, the musical performance, as well as the scientific and analytic approaches to music are *de facto* placed in the esthesic field" (Nattiez,1987).

c) The *trace* (also named "neutral level" or "material level") refers to the physical and material aspects, accessible to senses, that embody the symbolic form. It is the work in its material level, its immanent configuration. The poietic process "...cannot immediately be read within its lineaments, since the esthesic process (if it is in part determined by the trace) is heavily dependent upon the lived experience of the 'receiver'." (Nattiez, 1987).

Western classical conception of the generation and functioning of a musical work considers three functions: the composer, who generates the work, the performer, who actualize it, and the listener, who decodes it. A simplistic approach --as shown in figure 1-- could assign the framework of tripartition to this three categories, like:

1) The composer originates the poietic processes to configure the symbolic form.
2) The performer manipulates the trace generated by the composer.
3) The listener puts esthesical processes in action, to read and comprehend the symbolic form.

COMPOSER

Creation.
Intellectual Processes.
Generation of meaning.

PERFORMER

Performing.
Corporal processes.
Mediation.
Opaque to meaning.

LISTENER

Reading.
Enjoyment processes.
Rebuilding of meaning.
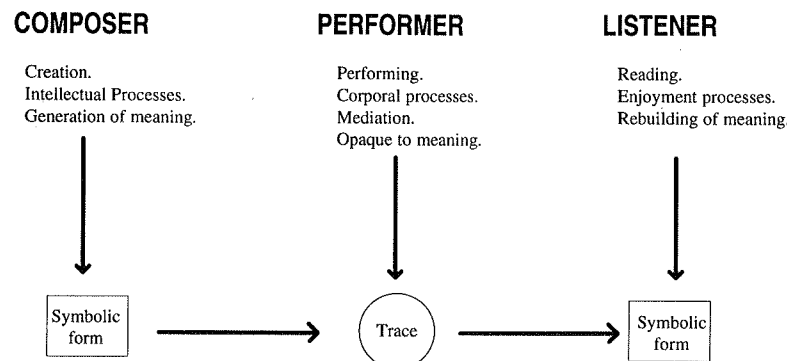
Symbolic form → Trace → Symbolic form

Fig. 1

Nevertheless, reality doesn't lend itself easily to this kind of simplifications. Although the functions of the composer, the performer and the listener are always present, it does not mean that these roles are necessary taken by different people. Let's take the example of a jazz improviser, that could be thought of as an almost "pure" performer, generating the work as he plays.

Without trying a morphology of music history or of the different aesthetics, we can see that the relationship among these roles varies according to musical periods and styles. To limit our analysis to the West, we see that historically, the roles of the composer and of the performer were intimately linked. In Bach's times, nobody could have imagined a composer who did not play one or several instruments, nor a good performer without compositional skills: music ideation was strongly related to its practice.

Other particular moments favored the separation between roles. For example, the medieval distinction between *musica theorica* --that was taught at universities along with mathematics--, and *musica practica* --made by singers and minstrles, generally of low social level and without a higher education--.

Closer to us, other ages have witnessed this separation. The situation of the baroque composer-performer begins to change with the development of the symphonic orchestra. In the romantic conception, the role assigned to the orchestra player was of a mere translator of the composer's intentions.

Berlioz, for example, imagined the orchestra as a big instrument. "The players of all kinds that constitute it, seem to be its strings, pipes, drums... machines become intelligent, but submitted to the action of an immense keyboard played by the conductor, under the direction of the composer." (Berlioz).

In symphonic music of late XIX and early XX centuries, the conductor, not the instrumentalist, was the responsible of musical decisions. Players lacked formation for the global comprehension of compositional processes. They only contributed doing an specific task, like workers in an assembly line, under the supervision of a foreman/conductor. We can see this phenomenon comparing well known treatises used for the formation of a professional flutist. In XVIII century, Quantz gave great importance, judging by the amount of chapters and pages, to the poietic aspects: handling of compositional structures, embellishment, aesthetic valuing criteria, etc. (Quantz, 1966). On the other hand, the Tafanel treatise --used till our days-- stresses the corporal skills, like scales, arpeggii, etc., without a need of comprehension of compositional issues (Tafanel, 1958) .

We find characteristics of this kind of practices in some of the studio recording techniques, when the instruments are recorded separately, in an artificial acoustic environment, without a real interaction among players.

This ideology of separation of tasks has led to a depreciation and underestimation of the role of the performer. Composers often look at the player as a mere executor of instructions, a necessary evil to translate -- and many times to betray-- their intentions. Total serialism happily welcomed the possibility of electronic music, regarded as an overcoming of the performer. The wish of "total control" of the whole sound phenomenon, makes the player be a pain in the neck because of the degree of deviation produced by the act of performing. The composer, by means of the tape recording, could finally shape his work once and for all.

This attitude of devaluation and ignorance of the performer's role by the composers is in the background of the trend that is the subject of this paper. Computer appears as an efficient and well-disposed slave, --much more than humans--, that liberates composers from the painful jobs related to music production, allowing them to focus in the "intellectual" aspects of their job.

The role of the performer

Nevertheless, we know that the process is much more complex. The performer also assigns meaning, impoverishes or enriches the immanent structures, puts the piece in context again. That is, he operates within the poietic, and thus he has responsibilities in creation.

For example, research on early music requires an active role of the performer, where esthesic processes intensify to the extent that they incorporate elements of the poietic field. A language is recreated, from and for another cultural reality, enriching the original symbolic form. "...every rediscovery is also an increase... ...my reading... does not base itself only in the codes and the ideologies that have been recovered..., but also in codes and ideological perspectives specific to our days (enrichment codes), that allow us to insert an antiquarian's object into another context, enjoy it because of what it already meant, but also use it for the connotations that we could attribute to it with our present lexicon. We deal with a succession of surprises, of adventures, when discovering in a form their original contexts and when creating new ones." (Eco, 1978).

In this case we see that performers make important decisions related to the configuration of the work. Dealing with context, also, they devoted themselves to communicational processes. Of course, not every re-interpretation implies an enrichment. Let's remember the polemic on the coloring of classical films, on pretext of adapting them to a contemporary audience. That films were conceived in black and white, and this is an essential characteristic of the work. In this case, interpretation impoverishes the symbolic form.

In the case of the performers of early music, more a piece is far from present cultural patterns, less information is received from the "neutral level" or "trace". The performers should apply readings of ever increasing complexity, projecting on the "trace" all the information brought by historical research, and taking care of not operating exclusively from their own codes.

This analysis reveals the fallacious of the conception of the performer as a machine. Related to communicational issues, we should consider performer's gestures as part of communicational processes, as empathic gestures. The body of the artist thinks and feels, and makes its production something specific. "The sense of touch and especially the propioceptive sense, informing the player of the muscular tensions and of the positions and movements of the joints, colour the sequence of sounds events with significations that emanate from the concurrent sequences of playing actions. The essential aspect in the present context is the dual potential of these movements to support and promote momentary musical meaning and to give a rich and complex inner representation of musical processes, thus contributing to the identity of the music work... " (Edlung, 1994).

Nattiez also says that "... there is an entire series of nonsonorous phenomena that are quite rightly considered musical, by musicians themselves", and the he quotes a pianist´s assessment: "certain pianists have the impression that they give 'depth' to a chord by allowing the fingers to slide toward the interior of the piano after they have depressed the keys". Nattiez relates that with the poietic side, and continuing saying: "this... indicates that a kinesthesic and tactile sensation can intervene in the interpretants that the performer associates with the music produced". Alfred Brendel, quoted by Nattiez, says that "the sound of sustained notes on the piano can be modified... with the help of certain movements which make the pianist's *conception* of *cantabile* actually visible to the audience" Nattiez concludes that "separating the musical from the visual and the kinesthetic is indeed difficult"(Nattiez, 1987).

The idea of Varèse, of a machine that could faithfully transmit to the listener the music written in a score, supposes that in the score should be represented all the richness brought by the performer, without which the work would lack its interest to the audience.

We must remember that in the case of aesthetics like electroacoustic music, when there is no apparent performer, it is the composer who must assume this role.

And here we come back to our subject. How could it be possible to represent something that one has no experience of? Can a composer formed without any instrumental practice --whatever it is-- imagine processes on which there is no register in his psychological apparatus?

Music for no-body

Nattiez poses the problem of musical meaning by means of the following definition: "An object of any kind takes on meaning for an individual apprehending that object, as soon as that individual places the object in relation to areas of his lived experience --that is, in relation to a collection of other objects that belong to his or her experience of the world." (Nattiez,1987). The meaning is thus "the constellation of interpretants drawn from the lived experience of the sign's user, --the 'producer' or 'receiver'--, in a given situation". "Meaning exists when an object is situated in relation to a horizon." (Nattiez,1987).

It is interesting to point out two implications of this definition, regarding musical work. First, when we relate the problem of signification with a subject, that send us back to the communication processes mentioned. Second, when we talk about "lived experience", "experience of the world" or "horizon" we are referring not only to intellectual experience but also to sensory, kinesthesic and propioceptive experience. Intention of communication and sensitive experience are the two elements that we stress as basics for the generation of a musical work.

These considerations became particularly important at the present stage of computers' applications to composition. As Gareth Loy says: "What has become of composing where formal practices are used is simply the relocation of the compositional decision-making process to a higher position. (...) Some low-level elements of the compositional decision-making process may be taken over by an automatic process, but the composer must still both choose the process and accept the results." (Loy,1989).

Nevertheless, we have gone through the repeated experience of listening certain kind of works, algorithmically generated, whose authors seems to ignore that they should have an audience, and do not give an adequate flow of information to keep the attention of the listener. This idea, that could be considered a subjective impression, is confirmed when listening what the authors of such pieces say about them. These kind of works seems to have been composed to illustrate a thesis, as a theorem demonstration, as a "correct" solution of an equation. They ignore the communication process.

Independently of the interest that some results of musical exploring through algorithmic composition have, we believe that leaving the control of certain kind of musical processes to machines implies an abdication attitude of the composer. Particularly we refer to the control of temporal processes, by means of machines that do not perceive time. As an example, for a computer that could generate fugues in Bach's style, it would be the same thing to play them at M.M.= 72 or at M.M.= 1/1.000.000. The structures are "correct" in both cases, but in the first one we humans could recognize musical processes, and in the second they are not perceptible. The fact of configuring a symbolic form does not guarantee that it will be inserted into a communication process.

Communication is a particular case within symbolic processes (Nattier, 1987). To make communication possible, other requirements involving the "horizons" of performer and listener should be accomplished, besides the composer's universe. Figure 2 intends to represent the complex processes involved.

For this reason, it is essential that the composer should be the first performer of his work, and its first listener. That is why we insist in the importance of forming composers on the basis of experiences that involve body gestures. The ability of mental representation of real-time processes must be constructed. It is not replaced with the use of a machine that solves the problems "correctly".

Quod erat demonstrandum?

At this point, we would like our objective to be clearly understood, and not to be interpreted as a reactionary position. We are not posing an opposition --absurd at this stage-- between man and machine. We are not questioning the use of computers as musical instruments, not even consider heretical the developing of AI systems that allow machines to compose like humans.

The capital problem to pose is not *"should we teach computers to compose?"*, but *"how can we teach composers to compose?"* Computers are a powerful medium for expanding the cognitive and expressive universe of already skilled composers, and an invaluable tool for their education. What we are posing is the nonsense of their use as an *exclusive* tool for music education, and even the possibility of self-defeating effects.

We would be told that nobody is supporting such a position. Nevertheless, the facts we mentioned at the beginning of this paper are pointing out that social processes related to music practice and teaching, are generating situations towards this direction.
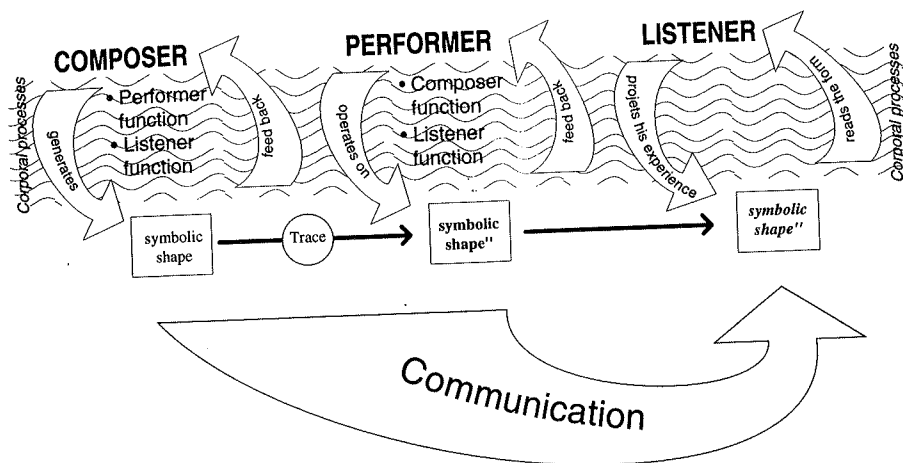
Fig. 2

The considerations above do not imply that the new ways of making music can't achieve artistic goals. Anyway, we do believe that these "users", trained without a connection with the body, will suffer an impoverishment of their musical thinking and an unawareness of certain processes of artistic communication. We do believe that composers' education should generate in them the capability to deal with a multiplicity of aesthetics, instead of limiting their expressive skills due to the lack of an integral musical experience.

Our emphasis on instrumental practice does not imply that we consider it the only way of developing the musical thought. This could also be achieved through singing, or through a deep, conscious and active listening of musical processes, or by means of the practice with virtual instruments sensitive to body gestures. Nor should this emphasis be understood as a preference for a given tool or aesthetics. We are not saying that somebody will necessary be a better composer because he or she plays Mozart's sonatas on the piano.

What we do believe is that the composers' education --or children's access to music-- should be carried out through activities that develop a connection with their bodies and that let them go out to meet the affective world of their peers. The authors are fully for a conception of music as a communication process addressed to others, rather than considering it an exclusively intellectual construction.

Artists interact with their works: this is what makes artistic creation one of the most enriching of human experience. A superficial scope of technological media considers them as a possibility of *making without effort*, emphasizing the generation of artistic product from an efficiency logic. However, artists know that it is not a matter of only achieving the product: even or more important than that is to go through the processes that lead to it. We do believe that --as in old fairy tales-- the experiences that take place alongside the way are what allow the protagonist, at the beginning clumsy and inexperienced, to find at the end the truth.

Conclusions

The formation of "composers/users", by means of their exclusive training on computers, is an actual possibility. These new operating ways imply a change in the paradigm of what was called composition so far.

New technological media should not be adopted noncritically for educational uses. When making use of them, teachers and institutions devoted to music education should privilege the developments that favor a connection of new musicians with their bodies.

Music ideation processes need a connection with sensitive reality for their development. Instrumental practice is one of the most efficient ways of achieving this connection, and at the same time of introducing the student to artistic communication.

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