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Gesture In Contemporary Music On The Edge Between Sound Materiality And Signification

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Abstract

In this paper I approach a variety of topics related to musical gesture in contemporary music. I explain how gesture can be understood in contemporary music. I show that sound materiality and signification are very closely related and that gesture is on the edge between them; that gestures can be regarded as a natural ground to justify compositional options; that significations can be introduced by gestures into the composition, and that to deconstruct stereotyped symbolic gestures is to bring them closer to sound materiality. I analyze transcultural significations in gesture and the reduction of signification to gesture. I comment on gesture in performance in the particular case of electroacoustic music, and I conclude by commenting on gesture and the poetic conception of the contemporary music as a resource to concentrate listening in one of its central plots.

Resumen

Este texto presenta varios temas relacionados con el gesto musical en la música contemporánea. Explica cómo se puede entender el gesto en la música contemporánea. Muestra cómo la materialidad del sonido y su significación están estrechamente relacionados y cómo el gesto está en el límite entre ellos; que los gestos musicales pueden ser considerados como una base de la naturaleza para justificar las opciones composicionales; que la significación puede ser insertada a través del gesto en la composición, y que la de-construcción de los gestos simbólicos estereotipados aproxima el gesto musical a la materialidad sonora. Se analizan las significaciones interculturales en el gesto musical y la reducción del significado al gesto en sí mismo. Se habla sobre el

gesto en la ejecución musical en la música electroacústica, y se concluye hablando del gesto en la concepción poética de la música contemporánea como un recurso para concentrar la escucha en una de sus tramas centrales.

In the 1950's sound segmentation in parameters was a common procedure to different compositional trends. It was thought that parameters kept their features unchanged regardless of the way they were combined. However, particularly after 1980 it has been recognized that parameters do not have such independence. The ways they are combined affect the way they are listened. Thus, a search for other alternatives for musical composition has started out.

In this paper I analyze one of these alternatives: gesture. First, I show that the relationship in music between sound materiality and signification is very close, and that gesture is on the edge between these two domains. Then I show that due to the contact gesture has with sound materiality, it can be interpreted as a natural ground to justify certain compositional options, acquiring a status similar to the harmonic series for tonal music. Due to the contact it has with signification, gesture can bring and introduce significations into the composition that are previous to the work. After that I show that gesture can accomplish different kinds of representations, and that the deconstruction of stereotyped gesture re-approximates it to sound materiality. Two considerations follow. On the one hand I show that hyper-valuation of the contact gesture has with signification may lead one up to state that gesture has transcultural significations, and I remark that it cannot be entirely verified. On the other hand I show that hyper-valuation of the contact gesture has with sound materiality may lead one up to state that to achieve new musical significations it is enough to search for a new sound materiality, and I remark that it cannot be entirely verified either. Finally two other important topics are considered: gesture in performance, where the particular case of electroacoustic music diffusion in concerts is considered; and the use of gesture to achieve a poetic conception of a work. I argue that the use of gesture as a resource for the transformation of that which is not musical into musical inside a work propitiates a dialogue between the work with other works, and concentrates listening in one of the central plots for contemporary musical thought.

Antecedents: from combinatory towards gesture

In the 1950's sound segmentation in parameters was a procedure that could be accomplished in different ways. The musical note could be segmented in pitch, duration, dynamics, attacks, register, timbre, and so on (see, for instance, the illustrative analyses of works by Karlheinz Stockhausen in Maconie 1990; by John Cage in Pritchett 1993; by Pierre Boulez in Padilla 1995, and by Iannis Xenakis in Xenakis 1971). However, segmentation could also be done at a lower level than the musical note. Timbre, seen as a complex entity, could be segmented in parameters such as frequency, time, amplitude, waveform, grain and several others. In electroacoustic, music parameters adopted by different types of sound synthesis are not always coincident. Additive synthesis, for

instance, uses sine waves; granular synthesis uses grain shapes, and synthesis by physical models uses elastic tensions of materials (for a general view on different types of sound synthesis see Roads 1994 and the collection of texts in De Poly, Piccialli and Roads 1991). But notes themselves could be combined to generate sound masses that could be treated as timbres. The work *Atmosphères*, composed in 1961 by György Ligeti, is an example. Later cases are found in spectral music, as in works by Tristan Murail and Gérard Grisey among others (a discussion on this theme can be followed in Barrière 1991). Unlike electroacoustic music, in this case segmentation happens at a higher level if compared to the musical note: notes themselves are treated as parameters that integrate a synthesis accomplished with musical instruments for the construction of sound masses, spectra and morphologies.

A fundamental assumption in the 1950's, important for what follows, is that parameters kept their properties regardless of how they were combined. This assumption disregards, for instance, that timbre changes according to the dynamics in which it is played, that the way a sound is attacked interferes in the perception of its duration, that the perception of pitch intervals changes according to the octave in which they are played. The assumption that the way a parameter behaves is independent from its relation to other parameters allowed composers to combine them in different ways as if they were essentially autonomous. For instance, in the text "Éventuellement...", a well known presentation about serial composition by Boulez (1995: 137-168), the starting point is the series Olivier Messiaen uses in his work *Mode de valeurs et d'intensités*, composed in 1950. This series and some of the compositional procedures mentioned in this text were used by Boulez for the composition of his work *Structures pour deux pianos* – first book. First the series is transformed in numbers and displayed in two tables. One table presents the original and its retrograde form. The other one presents its inverted and its retrograde inverted form.



Fig. 1 – The series of pitches in the work *Structures pour deux pianos* by Boulez. The notes are transformed in numbers from 1 to 12.

After that Boulez applies this series to durations. The numbering obtained for the series of pitches has to be the same used for the series of durations. The key here is that a single series is used to control different parameters in a composition. Otherwise, it would not be possible to obtain the desired general unity and coherence. The series of durations used by Boulez is the following:

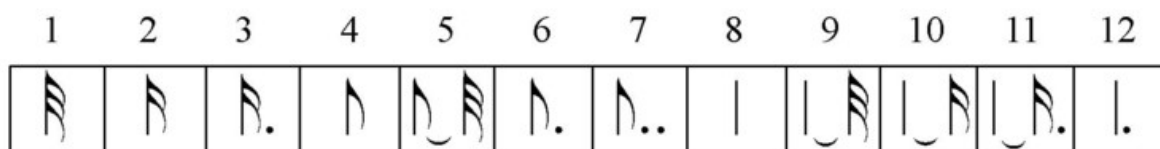


Fig. 2 – The series of numbers is transformed in a series of durations, being 1 equals one 32nd note, 2 equals two 32nd notes (i.e., a 16th note), and so on.

It is very interesting to observe that in the first steps of the method there is a considerable misunderstanding: the series of pitches does not match with the series of durations. While the series of pitches follows an order given to by the series by Messiaen, the series of durations follows a chromatic order. The relationship the series establishes with pitches is not the same as the one it establishes with durations. The proportions of durations are different from the proportions of pitches, which means that the two series in fact become different, which is clearly a contradiction regarding the serial method and its assumptions to generalize series to different parameters. A series of durations that follows the proportion found in the series of pitches would, for instance, be as follows:

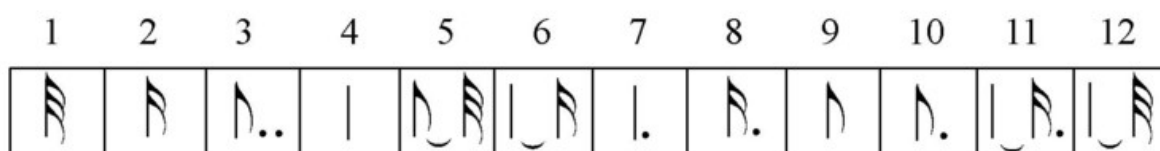


Fig. 3 – The series of durations according to the proportions found in the series of pitches.

It comes as a surprise that this point had not been noticed by Boulez either in his text or in his composition, since this mistake jeopardizes the serial method as proposed by him. In 1954, less than two years after Boulez's text, revisions on the serial method appeared in works as *Liebeslied*, by Luigi Nono. Seemingly conscious of inconsistent points as that one, some modifications Nono considers considered by Nono in the serial method he uses to compose this work point to less automatic procedures, making room to more musical results.

The assumption that parameters are independent from one another does not exist only in serial music. It can be found in several works by different composers belonging to different compositional trends in this period. *Music of Changes*, by John Cage, for instance, also uses a table of pitches, a table of durations and a table of dynamics, and is fully based on a combination of different parameters for the production of sound events. In this work, however, Cage does not use single notes, single durations and single dynamics in his tables. Instead, most of the time he uses sets of pitches, sets of durations – also including silence – and changes of dynamics as *crescendo* or *diminuendo*. Moreover, and in a very different way regarding serial music, what controls the combination of parameters is the I Ching and its toss of coins (Pritchett 1993: 78-88).

Another example that can be taken into consideration is the stochastic music by Iannis Xenakis. His work *Metastasis*, composed in 1953-4, is one of the main examples of stochastic music. In this work he establishes an analogy between notes and molecules of a gas (Xenakis 1976). This analogy illustrates clearly how Xenakis conceives parameters and notes themselves as if they were independent from one another, being susceptible to several combinations for the generation of sound masses. However, the analogy between notes and molecules is not really pertinent. Notes are abstractions built from sound phenomena. As such, they are closer to sound waves than to solid particles, such as molecules. If considered as waves, the independence assumed by Xenakis is not observed, since a wave may reinforce or cancel its amplitude when in contact with another wave, it may lose its individuality when merging with another one in cases when they blend into a new timbre, or it may allow a third sound to emerge when establishing specific relationships with other waves. Nothing like that happens to particles.

In the 1950's, the assumption that parameters are essentially independent from one another is connected with another assumption: that parameters have to be (or should be) neutral unities in some way. These assumptions together allow composition to focus exclusively on the way parameters are combined, instead of focusing on parameters themselves. I.e., the focus is on the structure of a work. The more the sound materiality used in a work is neutral (exempted of signification beyond its parametric information), the more it becomes efficient to be a bearer of a structure, a structure that is essentially autonomous concerning the sound materiality on which it is applied. That is the reason, among others, why in the 1950's *Elektronische Musik* used sine waves as one of its basic compositional material, and *Musique Concrète* defended the deletion of referential aspect in recorded sounds in order to consider their inclusion in a composition (an additional reason is the need for transforming the electroacoustic set into an instrument, as can be seen in Zampronha 2002). The historical density of sound materiality together with its referential in general is considered secondary. Structure is fully identified with the signification of a work. In the 1950's, what a work says is fundamentally its structure.

However, since the late 1970's and early 1980's, amid several transformations that happened in contemporary music, parameters mutual influence of parameters when combined clearly began to be taken into account. Besides, the referential aspect of sound materiality clearly started to be taken into account too, be this referential aspect historical, be it from another nature. An attack might influence the listening of a note duration, a bell sound might influence the listening by making references to some specific liturgical contexts, a specific chord might refer to *The Rite of Spring* by Igor Stravinsky or to *Farben* by Arnold Schoenberg among other works, or a sequence of pitches might refer, for instance, to Renaissance madrigals. And, in the late 1970's, even when all references were removed, the absence of references itself might then refer to the experiments made in the 1950's, which in the late 1970's had already become history. Complexity of listening and sound references then started to be taken into account. Ever since several proposals have appeared to deal with this new compositional panorama, and one of these proposals is gesture.

Gesture on the edge between sound materiality and signification

In highly codified systems, such as verbal languages, there is a strong independence between material vehicle and contents to be transmitted. Due to this independence, it is possible to observe changes in the material vehicle without a corresponding variation in the transmitted contents (Groupe m 1993: 53). That allows, for instance, to translate one language into another, or to express one idea using different words in one same language. However, in less codified systems, and this is the case in which music is included, the relation of dependence between material vehicle and contents is much more pronounced. Material vehicle and content are so close one another in music that the term "meaning" really does not seem to be adequate. The term "signification" seems to be an alternative to express the process of turning a sequence of sounds in music into something intelligible, without any reference to verbal language. A work of music cannot be translated. In music one musical idea cannot be explained using other sounds as if it were a word that, in verbal languages, can be explained using other words. Musical signification changes substantially when sound materiality is changed. Signification is closely related to its material vehicle in music, and almost blends with it. In this sense, material vehicle is not just a bearer of a musical idea that is strange to it. Material vehicle is a fundamental piece for the construction of musical signification. That is why all gestures, which take part into the construction of material vehicle in music, i.e., its sound materiality, are not accessories. Instead, they are important aspects which deserve full attention.

With regard to musical performance, gestures – performer actions onto an instrument – are much more important for the construction of signification in music than to the construction of meaning in verbal language. As states Clarke, "expression cannot be a learned pattern of timing, dynamics and articulation, remembered and applied to a piece each time it is played" (Clarke 2002: 64). "In particular, the body is not an 'input/output device', but is intimately bound up with our whole response to music" (Clarke 2002: 66). It is "as much a part of finding out about music as it is a means for its actualization" (Clarke 2002: 68).

With regard to musical composition, gesture comes to be understood as a sound materiality movement that generates a delimited configuration recognizable by listening as a unit. This unity is closely associated to signification inside a work. Parameters tend not to be treated independently from one another anymore. They are treated as a set, and the multiple interferences they produce one another are taken into account. In this context, global configurations that listening is able to apprehend from a sound materiality movement, their spectral and morphological transformations, are more important than a structure in which its logic serves to organize the microscopy of parameters in a work. The brushstroke a painter makes onto a screen can be understood as a visible mark of his or her gesture; likewise, in music sound materiality and its movement in time can be understood as an audible mark of a gesture onto an instrument. Besides, the path sound

materiality makes inside a concert room, as it happens in electroacoustic music, can also be understood as the mark of a gesture, or even as a gesture being made by a sound itself.

A gesture can be associated to a movement a performer makes to produce a sound. It can be associated to a sound materiality also, which becomes an audible mark of a gesture, or even a gesture itself. In both cases, gesture is on the edge between sound materiality and musical signification. It touches these both sides. This way it becomes an answer some recent contemporary music gives to the already mentioned issues opened by contemporary music in the 1950's. That is why it has a remarkable role in the construction of musical signification in contemporary music, deserving special attention.

The contact between gesture and sound materiality: gesture as a natural ground

Because it is on the edge between sound materiality and signification, it is possible to consider that the contact gesture establishes with materiality can give it a status similar to that of harmonic series in tonal music. Harmonic series is used to argue that tonal music is grounded in nature and, therefore, its laws are necessary, motivated. This kind of argument is found in Rameau (1717) and in Schoenberg (1974), for instance (on the relationship between music and nature see Fubini 2004). However, not always was harmonic series the argument used to ground tonal music in nature. Giuseppe Tartini, in his *Trattato di musica secondo la vera scienza dell'armonia* [Music treatise according to the true science of harmony], issued in 1754, considered the *Terzo Suono* phenomenon (the Combination Tones)^[1] as this argument. Nowadays it is known that this *Terzo Suono* is not an acoustic phenomenon. Instead, it is a consequence of non-linear features inside our hearing system, more specifically inside cochlea (to an introductory explanation see Cho 2000).

In fact, these and other authors are looking for a ground to justify in nature the musical laws they use, so that their laws are not a result from an arbitrary choice by composer or by a culture as a whole. In the 20th century this need somehow persists to certain authors. To ground music in nature by means of gesture is a consequence of a search to overcome the non-necessary, non-motivated relationships found in several musical procedures in the 1950's. Contemporary music post-1980 tries to replace the 1950's non-motivated combination of parameters by a motivated musical construction grounded in some reference. Gesture answers to this need. It is seen as a physical, concrete reference that can be used as a ground. The coherence gesture presents is transferred to composition to ground different relationships among parameters. Other contemporary music trends post-1980 use other references besides gesture. Sound spectrum is used to ground different compositional aspects in spectral music, as can be seen in works by Gerard Grisey (for a panoramic view on this theme see Barrière 1991). Or, in other cases, the historical density of sound materiality used in composition grounds certain forms of post-modernism, as in works by Alfred Schnittke or by Gilberto Mendes (1994). At a

certain extent the difference among several musical trends in the post-1980's is a matter of which ground a composer chooses to use in his or her work. Gesture is one of the possible grounds.

The contact between gesture and signification: gesture brings significations to the work

Brian Ferneyhough is one of the composers that uses gesture as central element in his compositions as much as in his theoretical texts. He considers gesture as an objective unit that has a specific configuration which is delimited in time and space, and that is "an iconic representation of the emotion" (Boros & Toop 1996: 283). Ferneyhough condemns the use of gesture as a representation of emotions in music because he considers that it produces a return to Romanticism. Alternatively he proposes the use of what he names *figure*. Figure, according to Ferneyhough, is the result of gesture deconstruction in parameters. Each parameter is given an autonomous unfolding, however somehow keeping the gesture as a backdrop. In this sense he tries to overcome the issues posed by the serial music in the 1950's without going back to Romanticism. As he states, "no longer does one attempt to create a gesture via the automatic coming together of abstract parametric units or quantities" (Borons & Toop 1996: 285), as used to happen in serial music. Differently,

one attempts to so construct gestures that the parametric qualities of which they are composed are released into the world of the music (...) in order to be able to conflate in different ways, or coincides to produce new gestural units (Borons & Toop 1996: 285).

However, gesture is not just a representation of emotions. The "Temporal Semiotic Unities" (*Unités Sémiotiques Temporelles*), as defined by François Delalande, for instance, can be considered gestures in another context. They are defined as:

Sound configurations that seem (...) to be bearers of a very specific "signification" on the temporal plan. Sometimes it is a configuration that one finds in a specific work. However, on the contrary, sometimes it appears in various contexts and under slightly different shapes, but having always more or less the same effect or the same temporal significance (Delalande 1996: 18).

Delalande gives as example a sequence of sounds listened as contracted and followed immediately by another sequence listened as expanded. He states that these two sequences together will be perceived as an unit with its own signification, regardless the work in which this unit is included.

It is possible to describe such sequence in morphological terms only. However, what properly defines it is the feeling that results from time precipitation followed by its expansion. (...) [It is] precisely the temporal signification "contraction-expansion" that allows to recognize and isolate this unity (Delalande 1996: 18).

So, as the Temporal Semiotic Unities shows – and as it will be discussed in the text topic –, gesture representation is not restricted to that of emotions.

To some extent Temporal Semiotic Unities and gesture match in many aspects. Both bring to a work significations that are related to them, and that are previous regarding the composition. In this sense the use of gesture in music post-1980 is clearly different from the search for a neutral sound materiality in the 1950's, which aimed to eliminate significations and references from it. In music post-1980 gestures are important exactly due to the references they accomplish, due to the significations they introduce into the work, significations and references that can be used in a creative way inside composition.

Gesture and different types of representation: the deconstruction of stereotyped gesture

Ferneyhough's criticism against the relationship between gesture and emotion is not entirely pertinent. On the one hand, Romanticism is not the only period in music history that includes emotion in its musical language. On the other hand, representations that gesture is able to accomplish are not limited to an iconicity of emotions. Besides iconic representations by means of which gesture can express several qualities of emotions and sensations, it can also accomplish indexical and symbolic (i.e., conventional) representations. A sound moving in a concert room through several speakers around the audience (as it happens in electroacoustic works) can be an indexical representation of a gesture in time and space, or even a gesture itself in action. Electroacoustic music can also create indexical representations of space distances (distant X close, direct sounds X reflected sounds) or specific time relationships (compression X stretching). Rhythm, dynamics and harmonic tension can generate indexical sound gestures that can point to specific polarized targets in music. Moreover, sound distribution in space can enhance musical segments, can articulate parts, or can amplify dynamics relationships. All art of electroacoustic diffusion is based on fundamentals as these. Besides, gesture can represent certain symbolic relationships. It can represent codified features which connect listening with a funereal march or a tango. It can also be a melodic line played by trumpets representing the typical gesture of an overture. Still, it can be a single bell sound that, exclusively due to its particular timbre and the way it varies in time, which in fact is gesture embodied in a spectrum and a morphology, can represent a specific liturgy^[2].

In fact, it is the symbolic aspects that certain gestures show when they represent certain emotions what is condemned by Ferneyhough. It is exactly symbolic relationships that are suppressed when gesture is deconstructed in parameters, particularly stereotyped symbolic relationships. The deconstruction proposed by Ferneyhough does not really seem to be a deconstruction of gesture itself. Gesture still exists in his deconstruction, and it is used as a key element to relate parameters among themselves in a significant unit. That is why he suggests that synchronic identity between gesture and emotion should be replaced by a diachronic identity, that is:

diachronic successivity as the central mode of 'reading' musical states, for the reason that a progressive accretional definition of musical vocables is indispensable if a counterweight to the suffocating presence of historically concrete stylistic triggers is to be created (Boros & Toop 1996: 34).

To deconstruct a gesture is to eliminate the triggers that make the stereotype and "the suffocating presence of historically concrete stylistic" they imply to appear. As I understand it, the term figure used by Ferneyghough is in fact a gesture without those triggers which set stereotypes in motion, specially the ones related to stereotyped emotions.

Besides, stereotypes place gesture far away from sound materiality, and that turns stereotyped signification relatively autonomous respect to it. So a deconstruction of stereotype brings gesture back to the edge between sound materiality and signification, thus being able to connect both domains again making room for the appearance of new musical significations.

The hyper-valuation of the contact between gesture and signification:
a search for transcultural significations

The search for a natural ground in music and the use of gesture as a concrete even physical reference whose coherence is transferred to composition (as if it had a status similar to harmonic series in tonal music) can lead some points of view up to excesses. Delalande, for instance, suggests that Temporal Semiotic Units can present transcultural significations:

One will also note that if the U.S.T. [Temporal Semiotic Units] owe their sense to "natural models", to "general codes", one can look at what is independent from a culture, a period, or a style. (...) It is fairly likely there are no cultural frontiers to this vocabulary (Delalande 1996: 22).

Experiments accomplished by members of the *Music, Semiotics and Interactivity Group of Studies* that I coordinate at the São Paulo State University show strong evidences that cultural context influences even the most basic sound perception, which until recently was not clear enough. In experiments on perception using speech sounds^[3] it was verified that native Portuguese speakers from Brazil distort the perception of vowel sounds shorter than 50 milliseconds, transforming all of them into an /I/. That is, an /a/ or any other vowel shorter than 50 milliseconds is heard as if it were an /I/. Even when there is no vowel sound an /I/ is inserted by the listening after certain consonants. Thus, a sound that does not exist acoustically is listened as if it were a real acoustic phenomenon. It is very interesting to observe that this phenomenon does not occur in native Portuguese speakers from Portugal. However, it happens in native Japanese speakers. What first calls our attention is that to native Japanese speakers from Japan all vowels shorter than 50 milliseconds are perceived as an /u/ instead of an /I/. The fact the vowels are different in the two cases led us to investigate what happens in cases where adult Japanese speakers immigrate to Brazil, having no previous contact with the Portuguese language.

The result was surprising: after learning Portuguese in Brazil these adults started to change all vowels shorter than 50 milliseconds to // instead of /u/. That was so unexpected that all experiments were verified again, and a set of an even larger number of new tests was done. The phenomenon was observed in more than 90% of the cases.

The sequences of sounds used in these tests were logatoms. That is, sequences of sounds that have no meaning either in Portuguese or in Japanese. This feature raised the hypothesis that their listening could be similar to the listening of timbres. The fact that distortion stops when vowel is longer than 50 milliseconds reinforce this hypothesis, since 50 milliseconds is the threshold above which we generally start to identify pitches and under which we generally identify just timbres, and the association between vowels and pitches is well known. Therefore it was decided that tests with musicians had to be done. Tests were accomplished with under-graduate students belonging to the last year of the under-graduate course in composition and conducting at the São Paulo State University. In tests in which students had free time to answer, the ear-training allowed the students to identify vowels lower than 50 milliseconds correctly in almost all cases, which demonstrates both that some approach between logatoms and timbre perception to identify the correct vowels is pertinent, and that training can change the way we perceive even very short and basic perceptual unities. However, in tests requiring fast answers the students had just a slightly better performance when compared to non-musicians, which indicates that cultural context and ear-training have their limits for transforming what is listened in these cases. Thus these experiments confirm that perception is in fact an interpretation, a semiotic action onto what is perceived, and listening can interfere in what is perceived up to certain limits. As a consequence, considering that sound materiality and significations are very closely related in music, listeners from different cultural contexts and different kinds of education and ear-training can perceive differently to the same acoustical signal, changing the way sound materiality itself is listened to and, as a result, changing its signification. These considerations tend to eliminate the hypothesis of transcultural significations. Based on these experiments, the maximum that is possible to accept is a partial transcultural signification, which still needs to be experimentally investigated.

The hyper-valuation of the contact between gesture and sound materiality: a search for the reduction of signification to gesture

Due to the close relation between sound materiality and signification it would be possible to consider that it would be enough to work directly on the gesture to achieve new significations. However, the reduction of signification to gesture can lead music to emptiness.

The reduction of signification to gesture is closely related to a change in musical writing. Musical writing becomes essentially prescriptive, that is, it points out as much as possible the actions a performer has to accomplish on the instrument to play the composition instead of describing the desired sound results (Seeger 1977; about different

relationships between musical writing and composition see Zampronha 2000). The greater the reduction of musical signification to gesture, the greater the prescriptive aspects found in a score. In borderline cases, prescribing a gesture in a score is akin to writing its signification. However, when prescriptive aspect of a score are excessive, signification turns out to be a result more related with choices a performer makes to play the score than with a musical thought that the score registers and a performer reconstructs. The act of playing one of these highly complex scores implies a search for gestures that can translate as much as possible what is prescribed into sounds. Due to the fact that the high complexity of some scores does not allow for the performer to play all that is required, he or she is compelled to make choices considering both what is prescribed by the score and the limits of his or her technique. He or she will play a subset of what is indicated trying to play as close as possible all that is prescribed. The score is then transformed into gestures. The chosen gestures make sense because they are conditioned to body nature in its interaction with an instrument (i.e., they have a particular syntax), and due to that fact those gestures bring particular significations to the work themselves (Zampronha 2000: 262). The association between gesture and emotion, between gesture and a stereotyped transcendent meaning is eliminated by this procedure. However, although this procedure is conceptually interesting, the work can also become a set of gestures with no sense. Moreover, some gestures chosen by the performer can be exactly stereotyped ones which, by means of adaptations, can match approximately what is indicated by the score. If that happens, the result is a distorted stereotyped gesture.

The image shows a musical score for Solo Violin, titled "tense, electrified". The score is written on a single staff with a treble clef and a 7/8 time signature. It begins with a tempo marking of 52. The score is highly complex, featuring a variety of dynamics including *ffz*, *mf*, *f*, *fff*, *pp*, *mp*, and *ff*. It includes numerous technical markings such as "gliss.", "p", "sub", and "poss". The score is divided into sections with measures 16, 7, 8, 16, and 17. There are also some unusual markings like "9-8" and "5-6" above the staff, and "terzico" written above a section. The notation is dense and intricate, with many accidentals and slurs.

Fig. 4 – Fragment of the work Terrain, by Brian Ferneyhough (1992: 1)

Although gestures can take part in the generation of a signification in music, neither all gestures produce new significations, nor signification can be reduced to a gesture. As already mentioned, signification in music is very close to sound materiality. However, no matter how close they are, signification in music cannot be reduced to gesture. In music, signification

is the result of a synthesis the mind accomplishes to make intelligible what is listened. This synthesis is not limited to the perceptible aspects of music, its material aspects as the sound phenomena for instance; however, it is also not independent from them. This synthesis is introduced in sound phenomena by the mind to create connections among them, connections that in another way they would not have (Zampronha 2004: 78).

In this definition the listener's cultural background is as relevant as the constraints that sound materiality imposes to the construction of certain connections made by listening. Sound materiality cannot determine exactly which connections listening will construct. However, it can prevent listening of constructing some connections. A Gregorian chant, for instance, cannot determine how it is to be listened; however it definitely does not allow listening to listen to it as if it were a standard twelve-tone music. It is in the dialogue between connections a listener accomplishes among those the sound materiality allows, trying to translate what is listened into something intelligible, that musical signification emerges. Therefore, musical signification cannot be reduced to gesture.

Gesture and performance: the particular case of electroacoustic music

A listener can establish an indexical connection between what is listened and gestures made by a performer on his or her instrument. Gestural indexicalities can be fulfilled in concerts, and the connection between gestures and sounds may constitute a rich field of interest for listening. Although several gestures are related to the production of sounds in music, several others such as facial expressions and body postures may have no relations with it. Instead, they may be related with socio-cultural values shared with the audience, and they can be introduced during a performance so that the listening is enriched with extra-musical significations. It is of interest, then, to verify what happens in electroacoustic music concerts when there is no other performer besides the one who makes the electroacoustic diffusion.

Although it is possible to state that in electroacoustic music gestures are eliminated from performance, it is also possible to state that in electroacoustic music the physical gesture is transcended, and that new possibilities not constrained by bodily limitations are now available (Smalley 1996). It is possible to consider the movement of sound entities in space as gestures themselves. Besides, the creation of different spaces and the change from one to another during a concert enlarges the notion of gesture to other domains.

Poor electroacoustic music diffusion might not introduce gestures in the work, and the listener might not perceive a real difference between listening to it in a concert or at home. Even worse, poor electroacoustic diffusion might even damage a work. Electroacoustic diffusion is an action upon recorded sounds (or sounds processed in real time), which can introduce gestures in it. Efficiency is achieved, among other aspects, when the listener considers what is listened as a result of gestures produced during the electroacoustic diffusion. Even when finger movements on a mixing board are not seen, musical sounds leave traces that allow listening to connect what is listened to gestures, which is of great importance in a concert. When that happens, gestures introduce additional significations that recorded sounds alone do not have. In electroacoustic diffusion gesture should impress listening as if it were the cause of what is listened. In this sense, it can, for instance, create articulations, create similarities, create different spaces using different sets of speakers available in the concert room, create or enhance contrasts, increase expressiveness, relate musical motives to space displacements, and

so on. Some basic mistakes in electroacoustic diffusion happen when fader movements (i.e., gestures) on the mixing board or other media are apprehended by listening in disagreement with the recorded sounds behavior, particularly in *diminuendos* (fade outs) or when a sound is displaced from one speaker to another, for instance. Another very basic and common mistake worth mentioning is the loss of stereo images due to an inefficient placement of speakers on the concert room, or due to a diffusion that sends a stereo sound to speakers too far apart, transforming a stereo image in two mono sounds. Many other mistakes can happen. However, among the most basic ones the apprehension of fader movements by listening is very amateurish, and one of the worst ones.

In an electroacoustic music studio (or at a home studio) the available interfaces to generate and manipulate sounds do not usually consider a causal relationship between the composer's action and what is listened. An indexical relationship is missing, which is not supplied by a mouse click, a joystick or a command typed on a keyboard. In an electroacoustic work, where almost all indexical representations can be absent, I consider it useful to include certain sounds that can represent gestures themselves, sounds that can be listened as sound gestures which produce other sounds and that have great impact in concerts. A sharp noise with a very pronounced *crescendo* about two seconds long can be listened as an attack gesture to the production of other sounds, as a granular low pitched one that immediately follows it, for instance. The first sound increases its tension and liberates it on the second. This attack-resonance model is used to connect the two sounds efficiently.

Moreover, in an electroacoustic context where the recognition of causalities accomplished by other sound gestures prevails, i.e., where the presence of sounds that represent gestures themselves prevails, the introduction of sounds without identifiable causalities acquires an important rhetorical effect, and can be explored thoroughly in the construction of several musical discourses.

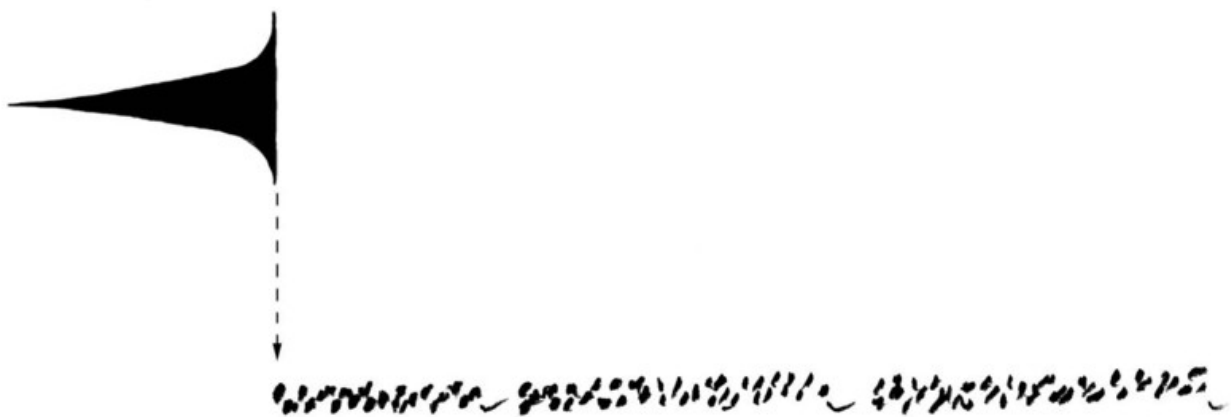


Fig. 5 – Fragment of the manuscript of the work *Concert for Electroacoustic Sounds*, by Edson Zampronha.

Gesture and the poetic conception of a work: the transformation of non-musical into musical

If listeners can recognize gesture as a delimited configuration, then somehow gestures can also be manipulated as if they were motives. Similarly to what happens in music from earlier periods, memory can keep pertinent traces which identify a gesture and can interpret new appearances of these traces as being new appearances of the same or a similar gesture. This is what can bring gestures and motives closer and this is what makes it possible to adapt a variety of motive manipulation procedures from other periods to recent contemporary music. However, gesture can be used in a very different way. It is possible to explore the fact that gesture is on the edge between sound materiality and signification and extract from that some challenging musical consequences of great relevance to recent contemporary music.

The work *Modeling III*, for solo flute that I composed in 1995, is an example that shows how parameters can be worked all together without destroying gesture. In the beginning of this work parameters are treated inside a note. They are manipulated in order to create a counterpoint of parameters inside this note. It is a counterpoint that presents a similar gesture embodied into different parameters as vibrato, dynamics, attacks, timbres, and so on.

The image displays three staves of handwritten musical notation for a solo flute. The notation is dense and includes various performance instructions and dynamics. The first staff begins with 'Vib molto' and 'fff', followed by 'pp sub' and 'ppp'. The second staff includes 'Molto articolato non vib', 'vib sub', 'non vib', 'pp sub', 'pppp sub', and 'fff sub'. The third staff starts with 'senza dim. pp sub', followed by 'pp', 'f sub', and 'pp sub'. The notation features numerous slurs, accents, and dynamic markings, along with some numerical annotations like '1 0' and '3'.

Fig. 6 – Fragment of the manuscript of the work *Modeling III*, by Edson Zampronha.

However the plot in this work goes far beyond this counterpoint of parameters. The plot is a result from a transformation, during the development of the work itself, of a sound materiality that is not music yet into music. The sound materiality used is a long nude and

transparent note. It is just a material a composer can use to create music. However, it is not music yet. This long note is almost reduced to the performer's daily exercises for the maintenance of his or her technique. However, due to all transformations this long note is submitted, this sound that is not music yet is precisely what becomes music. This transformation of what is non-musical into what is musical reveals that musical discourse is displaced, that what is usually considered accessory becomes the focus, that a note which traditionally is part of a discourse is now transformed in a context where another discourse happens. It is gesture, considered on the edge between sound materiality and signification, that makes it possible to transform (it would be more correct to say to re-signify, or, still, to trans-create), among the possibilities offered by sound materiality, what is non-musical into musical. The process of becoming aware of this transformation during the process of listening is the essence of the plot for the re-significations it implies, for the backward movements listening has to do in order to re-connect and re-consider what was listened in another intelligible way. Stereotyped gestures are inefficient to do that because they are far away from sound materiality and, at most, they generate an anecdotic effect when they impose to sound materiality a musicality that is strange to it. In fact, gestures have to be very close to sound materiality, almost identified with it, to do this transformation, to be the actors of this plot.

In this fragment of *Modeling III* the sudden *forte-pianos*, *vibratos*, attacks, are all musical gestures used to control the polyphony of parameters which trans-create the musical potential of a long note into something musical indeed, and they lead listening to the above mentioned plot, which is one of the main topics in contemporary music thought. Plots as this one exist in a similar way in works from previous periods, as in the initial *arpeggio* of the sonata Opus 31 No.2, "Tempest", by Beethoven; in the melody representing a barrel organ at the beginning of *Petrushka*, by Stravinsky; in the siren that invades *Ionisation*, by Varèse, or in many works by Cage in which sounds from daily life become musical. In *Modeling III* gestures are the key to transform what is non-musical into musical during the work itself. Gestures are the key to make listening sensitive to this plot that in this work appears in an innovative context and is made using different resources.

This transformation from non-musical into musical illustrates that the complexity of a work is not necessarily (or exclusively) a result of a structure with plenty of complex relationships. In this transformation, the backward movements listening makes to re-signify what was listened promote the emergence of a multiplicity of discourses, either among different parts of one work or among the work with other absent works. Thus, a work becomes a stage on which a complex dialogue among works and different parts of the same work happens. The mentioned work by Beethoven, for instance, converses with the Baroque and with itself (the *arpeggio* that seems to be an introduction becomes an essential part of the 1st theme and, at the same time, makes reference to a Baroque recitative, as can be seen at the beginning of the re-exposition); the work by Stravinsky converses with traditional sentences from the Classic period; the work by Varèse converses with sounds that have social and coded meanings, and many works by Cage converse with sounds from our daily life that become, in some cases, ready-mades. In

these cases, to listen to a work is to listen to other works or sound contexts simultaneously, which generates a net of quite complex re-significations that can enrich the work effectively listened as much as enrich the absent works it converses with, changing the way we listen to them. Some composers put this dialogue explicitly inside a work, as it happens in the 3rd movement of the *Symphony*, by Luciano Berio, which converses with Gustav Mahler, or in the 3rd movement of the *3rd String Quartet*, by Alfred Schnittke, which converses with Orlando di Lasso. Those are fundamental points to contemporary music, and gesture is decisive to achieve them.

Final considerations

The use of gesture in contemporary music post-1980 is an answer to technical and aesthetical assumptions found in music proposals since the 1950's. In particular, to the basic assumption that states that parameters keep their features unchanged regardless the way there are combined, which generates important consequences regarding the neutrality of sound materiality, structure and listening.

In this paper I have approached a variety of topics related to gesture in contemporary music post-1980 that, in brief, shows:

- That gesture is on the edge between sound materiality and musical signification, touching both domains;
- That gesture is not neutral, and brings different significations to the work;
- That in some cases gesture is used to ground music in nature, overcoming issues that resulted from the use of non-necessary and non-motivated relationships as in the 1950's, which gives gesture a role similar to the harmonic series in tonal music;
- That representations that gesture can accomplish are, besides the iconic ones, indexical and symbolic ones, and that to eliminate stereotyped symbolic representations is to bring gesture back to the edge between sound materiality and signification;
- That the hyper-valuation of the contact between gesture and significations can lead one to state that gestures have trans-cultural significations, and based on experiments I remark that it is not entirely correct;
- That the hyper-valuation of the contact between gesture and sound materiality can lead one to state that significations can be reduced to gestures alone, and based on the analysis of the consequences this point of view has on scores I remark that it can not be entirely correct either;
- That it is possible to relate gesture and performance even in the case of electroacoustic music, and I observe general aspects on how gestures are present in the particular case of electroacoustic music diffusion in concerts.

I conclude by showing that gesture can be used in a challenging way by the poetic conception of recent contemporary music. Although some authors want to find in gesture a natural ground to justify his or her musical procedures, this approach to gesture seems to have almost no relevance to the construction of a contemporary music composition,

having almost no momentum to go beyond personal circumstances that find in gesture an answer to personal issues. Being on the edge between sound materiality and musical signification, gesture turns out to be an efficient resource through which it is possible to transform what is non-musical into musical inside a work. A work based on this transformation generates a complex plot resulting from the many re-significations it generates in listening, which makes room to a rich dialogue between the work and other works. It becomes then a way by means of which composers can focus listening in this plot that is one of the main important topics for the construction of contemporary musical thought nowadays.

Footnotes

1. *Terzo Suono* or Combination Tones is a phenomenon that happens when two sounds of different frequencies sound simultaneously and a third sound starts to be listened. The two sounds are usually in simple interval relation, and the combination tones are more audible when the two sounds are played forte. The frequency of the third sound is either the difference or the sum of the frequency of the other two ones. That is why combination tones are also named respectively differential and additive sounds.[§]
 2. Iconic, indexical and symbolic representations are classes of signs that belong to Peirce's semiotics. For an introduction to his semiotics see Merrell 1998 and Santaella 1995; for a synthetic presentation see Nöth 1990, for an introductory vision of semiotics applied to music see Zampronha 2001. Peirce's semiotics also bases the "Temporal Semiotic Unities" by Delalande, although he does not make reference to Peirce in the text quoted in this paper.[§]
 3. Tests accomplished with Érika Maria Parlato as part of her Doctorate Thesis still in progress at Pontifícia Universidade Católica de São Paulo (PUC/SP) and École de Hautes Études en Sciences Sociales (EHESS), having as her tutors Prof. Dr. Emmanuel Dupoux and myself..[§]
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