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Aspects of the Common Implications in Time and Metric in Collective Free Improvisation in the Recorded Work: *Musicking Shapes*

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Abstract: *During the production of Eduardo Lopes' record Musiking Shapes, several aspects were identified that suggested an unpremeditated collective consciousness in aspects such as metrics and pulse, in a work that was based on unconventional notation, without any time-related indication. The intention was to identify a kinetic of collective pulse with common time and metric implications. The methodology applied involved auditory observation through spectrograms and the respective transcription in the musical notation of the recorded music. When triangulating these data, substantial results of the communication that underlies the interpretation of this unconventional notation were found. It was possible to prove an effective organization through what we call Prevalent Sound Events (PSE) and that these are determining factors for the collective organization that typifies musical discourse, consubstantiating the spontaneous organization of these moments in Vertical Agreement Sound Events, Horizontal Agreement Sound Events and Absolute Agreement Events.*

Keywords: *Collective Improvisation, Common Metric, Collective Pulse*

1. Introduction

The record *Musicking Shapes* was produced based on unconventional notation, without any time-related indication. Since it is a collective effort that did not rely on any previous work, with implications in spontaneous improvisation, it nevertheless presented substantial auditory signs and results during the record's production process, in an apparent kinetic of collective time. From the very beginning, this evidence revealed a quite interesting result, when assessing the associated issues of musical interpretation.

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What factors fuel this collective awareness of the pulse of time? Or can this same pulse contain a hierarchical order, allowing one to perceive a sound event that determines that pulse in a certain moment, while conditioning the subsequent?

This article will consider that ambiguity is a factor that may condition the perceptual analysis. Nonetheless, the results presented intend to be as precise as the means we use so allow. Regarding this ambiguity and according to the cognitive scientist Roger Shepard, professor at Stanford University, "ambiguity in perception means that the same physical stimulus may produce different perceptual interpretations on different occasions" (Shepard 1999, 123).

2. Objective and object of the study

Considering that study's target is the musical performance without notation as a guide for interpretation, this study's objective was to assess how the musical discourse of the interpreters was organized, in what way and what elements we may gather to identify this apparent organization.

To choose an object of study that could properly fit its objectives, the excerpts were carefully chosen (Figure 1) without rhythmic patterns, albeit improvised, deeply marked so as not to condition the discourse of collective improvisation. Therefore, rhythmic patterns of repetition or ostinatos, which also enforce a collective rule of random and improvisational discourse, were excluded from this study.

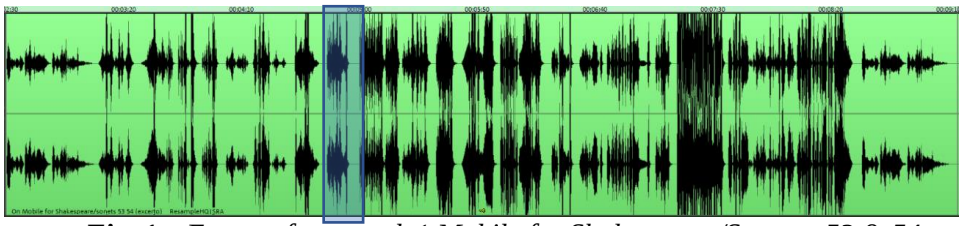

***Fig. 1** – Excerpt from track 1 Mobile for Shakespeare/Sonnets 53 & 54 (own source)*

This case was centered on excerpts from *Mobile for Shakespeare/Sonnets 53 & 54* [track 1] by R. Haubenstock-Ramati, coordinated by Paulo Gaspar, with Paulo Gaspar on the clarinet and Eduardo Lopes on drums as performative agents. *Flower song II* by L. Andriessen [track 5], having as coordinators and performative agents João Moreira on the trumpet, André Fernandes on guitar and Eduardo Lopes on drums. *Untitled* [track 6] by C. Szlavnics, coordinated by Nelson Cascais and having as performative agents Mário Marques on the soprano saxophone, José Menezes on

the tenor saxophone, Paulo Gaspar on the clarinet, Nelson Cascais on the double bass and Eduardo Lopes on the drums.

3. Methodology

The methodology used was auditory observation and spectral analysis through audiograms. Identification of sound elements that, by default, had a meaning and purpose when collectively organizing those moments that did not present any seeming organization. Identification of these elements and the consequent transcription into the musical notation of the recorded music of the chosen excerpts, considering their suitability to the factor known as the absence of metrics of perceptible continuity and the absence of an indication of pitch and duration of sounds. Analysis and subsequent discussion of results based on the triangulation of the collected elements. The software *Samplitude pro pro X* was used for the auditory observation to identify the chosen excerpts and the Prevalent Sound Events. When transcribing the chosen excerpts, the musical editing software *Sibelius* was used.

4. The rhythmic perception of sound movement and the kinetics of collective time

There are several studies on time and its perception that provided a crucial contribution to our understanding of the importance of cognition in rhythmic interpretation. Citing Eduardo Lopes "In music, chronological time (Chronos) and the meaning's temporal dimension, informing the proper understanding and interpretation of events, perception, action and cognition (Kairos) reveal a dialectical interaction through rhythmic structures, whose chronological time ensures the organization and an ability to understand the meaning of musical elements and their emotional consequences in the interpreter and listener (THAUT 2005)" (Lopes & Alcântara-Silva 2017, 235).

Citing the same author "Generally speaking, rhythm is an orderly, periodic and cyclical temporal process that nurtures predictability, anticipation and the subsequent feeling of comfort. Periodicity may facilitate the perception and a better representation of the rhythm itself, as well as greater precision in the reproduction of the rhythm (GRAHAM ET AL. 2005)" (Lopes & Alcântara-Silva 2017, 236).

This study is regarded as important to explore evidence that the same phenomena could occur collectively within specific musical contexts. These specificities are defined by having a non-imposing character of such conditions from one individual to another, in a non-conditioning perspective within the collective musical process.

The major question would be whether individuals in a collective musical context, without defined musical indications of metrics, rhythm and pitch of sounds, tend to find collective kinetics as a form of musical organization.

Is there a collective cognitive organization in specific musical contexts? This organization occurs because of well-defined events in musical moments which are not premeditated and that are likely to be defined, in our opinion, as rather rare coincidences.

The record *Musicking Shapes* has conditions seemingly suitable for the conduction of this research, starting with its collective improvisation approach, without any indication of metrics, time, or pitch of pre-defined sounds.

Equally important are the individuals that partook in the record, chosen for their quality and experience in the way they qualitatively interpret the condition of improviser/communicator. The premise of this condition was having a relevant resume in musical production within the musical genre known as Jazz.

5. Prevalent Sound Events and integrated simplification of the collective rhythm

From an observation standpoint, relying on the listening and sound visualization that took place, the result of that same observation tended to reveal sound events that prevailed in acoustic mass and intensity concerning others. By itself, this fact does have enough significance. But the events of lower acoustic mass that took place between them resulted in an apparent rhythmic agreement and were consequentially interrupted in that agreement by the next prevailing sound event. The rhythmic agreement consisted of an apparently simplified metric in metric quantization, one that, when established, would have to present evidence in the transcription of these sound events between sections previously designated by the prevailing sound events hereinafter referred to as PSE.

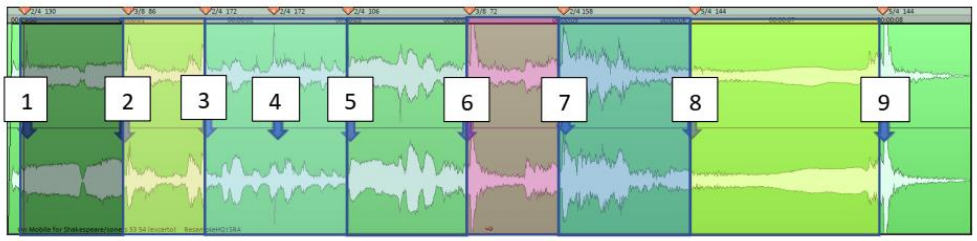

Fig. 2. *Audiogram of the excerpt referring to example 1 (own source)*

The observation conducted by relying on the excerpts' musical transcription clearly showed that the prevailing sound events broke a rhythmic metric that induced a more or less evident next-moment pulse. After that PSE, it was quite difficult, musically speaking, to follow a pulse that made sense with the metric that had been established before the previous PSE. Therefore, it broke with the metric of the previous moments. Through the selection between two prevailing sound events, and their continuous repetitive *play (*loop)[2], a reorganization of metrics was perceptually observed, which made a new rhythmic order (pulse) also more evident, from a musical standpoint.

Based on Figure 2, we can see the PSEs, having as reference the beginning of each bar in which the pulse initiates new tempo, in bars 1, 2, 3, 4, 5, 6, 7, 8, in figure 1, in different shaded boxes.

The following suggestion was the reorganization of the pulse between PSEs. This assumption was pursued by transcribing the excerpts into musical notation, which clearly showed the rhythmic simplification of a discourse, one that was a rhythmic standpoint of complex auditory perception. The term rhythmic simplification emerges from the need to justify a readable musical notation that may be classified as having a predominantly primary complexity and a secondary degree of subdivision[3]. In figure 3, we can see this rhythmic simplification.

In this case, events of spontaneous vertical synchronization (vertical agreement) were suggested as well[4]. The observation of Figure 3 refers us to the alignment between ESP in a predominantly primary and secondary subdivision and that as we can observe the various moments of vertical agreement. These events, having in this case only two interlocutors, performative agents of a collective improvisation and, considering its free trait, of an inconstant or predominantly nonexistent pulse, show the unprepared, collective synchronization ability in spontaneous musical discourses.

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2 In musical lexicon, a *loop* is a repeated section of sound material. Short sections of the material may be repeated to create ostinato patterns.

3 We regard as primary grade subdivision a rhythmic figure that divides in two a sound and secondary event that divides in four. For the most part, we also consider these degrees in ternary sub-divisions, i.e., the rhythmic figure that divides into three primary degrees and that divides into six secondary degrees.

4 We give the Vertical concordance to sounds that occur simultaneously and/or in homorhythmia.

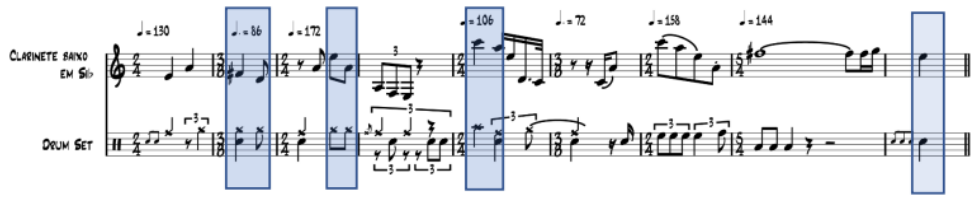

Figure 3 *– Excerpt transcription of Mobile for Shakespeare/Sonnets 53 & 54 [track1] (own source)* [5]

Citing Bondesan dos Santos and Pedro Paulo Köhler on rhythmic ambiguity: "The experimental work on subjective accentuation (POVEL & OKKERMAN, 1981) is one of the most important research efforts that help to justify some of Lerdahl and Jackendoff's preference rules. Povel and Essens (1985) also propose perception models that can specify which characteristics of temporal patterns will determine its organization, besides the empirical support (POVEL, 1981) for the temporal pattern model, consisting of at least two levels: the upper order of times (beats) and a lower order formed by the subdivisions of times" (Santos & Köhler 2012, 4).

According to these theoretical implications, this study intends to emphasize the evidence that corroborates at this level a practical implication in the process of musical creation. Citing the same author: "The neuroscience experiment cited in Chapter 2, Tagging the Neuronal Entrainment to Beat and Meter (NOZARADAN, PERETZ, MISSAL, & MOURAUX, 2011), one that could be translated as "Marking Neuronal Timing and Metrics", suggests the possibility of following brain response when it is proposed that a subject listens to an isochronous sequence of sounds with erratically arranged accents and then endogenously reconstructs a binary and a ternary metric. This reconstruction would happen through the voluntary projection of binary and ternary metrics by the listener. This points to the possibility of creating an experiment to attest neuronal responses to ambiguous rhythms" (Santos & Köhler 2012, 5).

Corroborating a previous article, Lopes declares: "From the physiological perspective, in the conception of his biological clock theory, David Epstein (1995) cites several scientists such as Einstein, Gooddy, Lashley, and Poppel (as well as Weiner's cybernetics). For Epstein, the human body works as a large clock that reacts to the array of smaller clocks represented by different human organs; the

5 The following example can be listen to using the QRcode:

"final clock" will then be an abstraction derived from the sum of all internal temporal subsidiary forms – all the "clocks" that make up our body. The primary basis of all clocks will be the rhythmic mode through which our nervous system acts and transmits signals" (Lopes 2006, 4).

Therefore, the content of previous studies and experimental works is deemed significant, even in fields such as neuroscience, as this case study aligns itself with, to corroborate these lines of research.

Nonetheless, this study intended to find other data that could prove more convincingly this collective ability of synchronization and the perception in the functioning of this major clock. By increasing the number of actors, these events would be even more impacting. Thus. in the excerpt chosen for this observation, there were four participants.

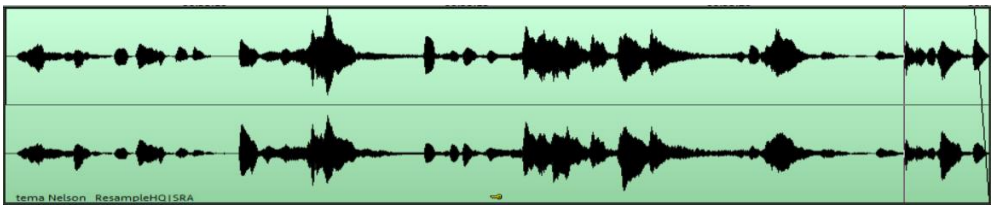

***Fig. 4** – Audiogram of the excerpt referring to the Untitled example [track 6]. (own source)*

In the example transcribed in Figure 4, mentioning an excerpt from the *Untitled* track, an analysis was conducted to identify interpersonal procedures that would result in a collective behavior identical to that analyzed in *Mobile for Shakespeare/Sonnets 53 & 54*, i.e., not only between each PSE, the pulse had a rhythmic order seemingly organized, but there were also elements of vertical agreement (examples A and B).

This confirmation of events in the two excerpts analyzed proves a high cognitive intuition in the musical language, even with formations with more interpretative actors.

In a subsequent observation, it equally possible to attest a widely relevant phenomenon, in which the hearing and its respective transcription revealed a horizontal agreement[6] of sound event (example C).

6 We assign the name horizontal agreement to sound events that occur in unison or octave.

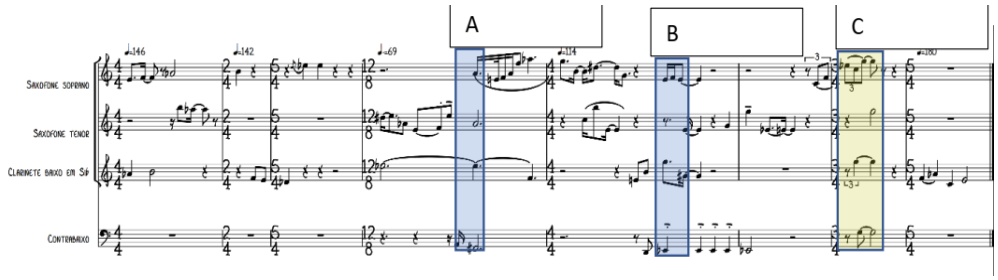

Fig. 5 *– Transcription of the excerpt regarding the Untitled track [track 6] (own source)*[7]

As shown in Figure 4, the last event marked depicts this horizontal agreement. Even though this event is not perfectly rhythmically synchronized, the musical figure that results from a reading of the general score reveals an almost impossibility of premeditation. This event is rather significant in a cognitive approach to sound pitch perception and shows an ability for spontaneous musical communication.

When looking for more identical results in other examples from the record, the question was raised whether it would be possible to locate and identify a sound event that added the two previous cases, i.e. an agreement both vertical and horizontal. If that could happen, that sound event in unison would be called an absolute agreement.

It would be a spontaneous event where at least two actors would spontaneously play the same notes with the same rhythm.

In the following excerpt of L. Andriessen's *Flower song* [track 5], having as coordinators and performative agents João Moreira on the trumpet, André Fernandes on guitar and Eduardo Lopes on drums, a transcription and an auditory analysis were made.

7 The example can be heard using the following QRcode:

***Fig. 6** – Audiogram of the excerpt referring to the example Flower song II [track 5]. (own source)*

In the analyzed excerpt of the track *Flower song II*, it is possible to typify the musical context as rhythmically fluid, but with an activity that would not premeditate concerning future events. Harmonically, the discourse also does not converge towards an irrefutable tonal pole. The result of what has been analyzed surprisingly reveals an event that converges towards cognitive understanding in the art of communication.

An absolute agreement[8] was seen in the fourth bar. The interpreters João Moreira on the trumpet and André Fernandes on the guitar converge in a unison in an eighth note. As shown in Figures 6 and 7, this sound event satisfies the suggested search, which results in the sum of events of vertical agreement with a horizontal agreement.

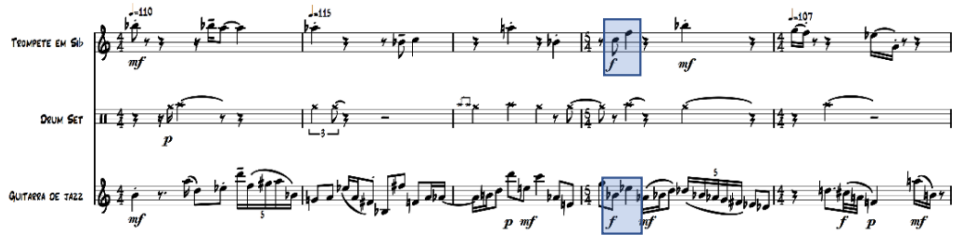

***Fig. 7** – Transcription of the excerpt related to the track Flower song II [track 5]. (own source)*[9]

8 We assign the name absolute agreement to sound events that occur in unison and rhythm cumulatively

9 The example can be heard using the following Qrcode:

The talent and skill of jazz musicians are widely known, who relate musically between themselves, converging many times towards a musical discourse of question and answer, in which the result is motif-led *canons* of counterpoint effects. The past experiences of many musical dialogues reveal a substantive influence when it comes to materializing these results. However, the event identified in this example shows an ability that goes beyond experience and training, introducing a cognitive development that is materialized without premeditated influence in spontaneously improvised music.

This cumulative fact, the absolute agreement as to the sum of both horizontal agreement and vertical agreement, is evidence of the result of cognitive skills. However, in our opinion, it is also an opportunity to develop the study and understanding of these events of creative simultaneity in future works.

6. Results/Conclusions

In the three excerpts of the record chosen, rhythmic and sound amplitude elements that reveal a collective organization in musical discourse with an unconventional metric were chosen.

The methodology used combined the analysis of musical excerpts that integrated that condition of musical material without preorganization, ensuring spontaneity in its feasible essence, by analyzing transcribed excerpts for conventional readability musical notation.

The results obtained proved an effective organization through what we call Prevalent Sound Events (PSE) and that these are determining factors for the collective organization that typifies the musical discourse. It was also possible to identify, as a result of this spontaneous organization of musical discourse, Sound Events of Vertical Agreement, Sound Events of Horizontal Agreement and Events of Absolute Agreement.

The observation using the musical transcription of the excerpts clearly showed that prevailing sound events broke a rhythmic metric, inducing a next-moment pulse that was evident and different from the previous one, consubstantiating a result of collective organization with adaptive implications at different moments, becoming a remarkable and surprising observation.

The identification of these types of collective events and behaviors emphasizes the existence of musical material of spontaneous collective organization when exploring musical material whose cognitive results are also seemingly collective. In the case of the Event of Absolute Agreement, this aspect is particularly relevant when considering, in the musical context presented, that the hypothesis of this event may happen for a reason other than the refined musical perception.

It is also possible to conclude that the actors in the musical process under scrutiny were important, considering their experience and training required, because

they are experienced musicians in the field of jazz, something predominant in the results obtained.

Therefore, this case study adds a contribution that we deem important in the further development of the analysis of phenomena that indicate cognitive results and the relationship that these have with the individual creator and interpreter in the performative field.

7. References

Bondesan dos Santos, Pedro Paulo Köhler. 2012. *Rhythmic ambiguity: Study of musical rhythm from the perspective of current models of perception and cognition. Masters dissertation. School of Communications and Arts, University of São Paulo.*

Lopes, Eduardo & Alcântara-Silva, Tereza. 2017. *Research topics for learning the musical instrument – Eduardo Lopes, (Ed.), Musical Rhythm, improvisation and Cognition as Important Elements in the Formation of the Instrumentalist (pp.234-251) - Goiânia / Kelps*

Lopes, Eduardo. 2003. *Just in Time: towards a theory of rhythm and metre*. PhD Thesis, Music Department, University of Southampton.

Lopes, Eduardo. 2006. *The musical metric in the perception of movement: the gravitational concept, Magazine of the Postgraduate Program in Art at the University of Brasília, Sao Paulo, vol. 5 nr. 2, 32-41.*

Shepard, Roger.1999. "Stream Segregation and Ambiguity in Audition", in *Music, Cognition, and Computerized Sound*. Perry R. Cook, editor. The MIT Press.pp 117-127

Thaut, Michael H. 2005. *Rhythm, music and brain: scientific foundations and clinical applications*. New York: Taylor & Francis Group, 2005, pp 85 – 112.