DOI 10.20504/opus2017b2301

The Context of Improvisation in Instrumental Popular Music under a Systemic Perspective

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Abstract: In this article, we attempt to construct a theoretical framework that supports the study of the inner dynamics inherent in the improvisation of instrumental popular music, especially regarding jazz and Brazilian popular instrumental music. Our considerations may provide conceptual support for an analysis of cases from a variety of technical-aesthetic realities, since we address the general elements and behaviors practiced in these situations. We reflect on the artistic object which is based on concepts derived from an interdisciplinary analytical model supported mainly by a systemic process.

Keywords: Improvisation (music); systemic process; jazz; Brazilian popular instrumental music.

O contexto de improvisação em música popular instrumental sob uma perspectiva sistêmica

Resumo: Neste artigo procuramos construir um arcabouço teórico que possa auxiliar no estudo das dinâmicas internas inerentes ao contexto de improvisação em música popular instrumental, notadamente no que se refere ao jazz e à música brasileira popular instrumental. As considerações expostas podem servir como suportes conceituais para o processo analítico de casos encontrados nessas diferentes realidades técnico-estéticas, uma vez que, de maneira geral, abordamos elementos e comportamentos observados em práticas disseminadas dentro das vertentes supracitadas. Buscamos propor um olhar reflexivo sobre o objeto artístico a partir de conceitos provenientes de um modelo analítico interdisciplinar, que tem na Sistêmica a sua principal sustentação.

Palavras-chave: Improvisação (música). Sistêmica. Jazz. Música brasileira popular instrumental.

SILVA, Raphael Ferreira da. The Context of Improvisation in Instrumental Popular Music under a Systemic Perspective. Transl.: Kathleen S. Martin. *Opus*, v. 23, n. 2, p. 9-29, ago. 2017.
http://dx.doi.org/10.20504/opus2017b2301

Submitted on 03/02/2017, approved on 05/05/2017.

In our attempt to develop an analytical approach that will allow us to explore the context of improvisation while executing instrumental popular music[1], we found systemic reasoning as a means to support our study. Thus, we plan to address many of the processes involved in the making of music that is simultaneously performed and created, generally supporting the genres of popular music. In addition to musical aspects, we also intend to address facets of theoretical references to extra-musical relations and interactions between performers to elucidate how they form a complex system.

To understand the *modus operandi* of a particular style, we accept that it does not suffice to simply dissect the modes of creating melodies of the most emblematic improvisers; but, we must also analyze the workings of the group as a living body containing a chain of interrelated events. We believe that within the context of collective music creation implicit in improvisation of instrumental popular music, the whole is simultaneously a product of (1) the specificity of constituent parts (subjects + conceptual elements); (2) the relations and interactions between these parts; (3) the arrangements and organization that not only result from the relations and interactions, but also conduct them; and (4) the adjustments rendered from the emergence resulting from this set of events. From the words of Morin (1997: 121), we consider these phenomena to form a circuit of feedback that is simultaneously and continually adjusting its processes. Therefore, in some way, during the process that makes up the performance, the constituent parts act as segments of the whole through the organization provided by both the system's interrelationships and the specificities and idiosyncrasies inherent to the parts.

In the analytical model proposed here, the Context of Improvisation in Instrumental Popular Music, hereon designated CIIPM, is formed by systems and processes. There are relations and interactions within the system that can be processed by mechanisms; each musician is a subsystem, as well as each conceptual element that constitutes the environment of improvisation. As Andrade (2011: 36) observes, what defines an element, system or subsystem, or the way we look at the more general organization of a system, depends on the perspective or purpose of the observer. For Sarath (2013: 211) all systems or system components are part of a larger systemic scheme, where any level functions as both a constituent of a higher level and a component within which constituent parts can be found. We chose to delimit the CIIPM as our lower level of complexity. This object is constituted by material (subject) and conceptual elements (genre, grammaticality, style, mechanisms and habit).

So that CIIPM can be analyzed from a systemic perspective, we start from an ontological perspective where this object is formed by the relationships between the improvising subjects and by the constituent elements of the environment in which improvisation is developed. However, concept and reality do not necessarily coincide. In our study, there may not necessarily be an identity between concept and object, since the concept is an abstract, formal construction, and reality is much more complex overwhelming any model. Although we have elaborated a theoretical framework from the evidence present in the reality, this conceptual construction does not fully comprehend reality. Still, however, the model is the tool required to understand, even if partially, the factual aspects. We seek to construct a model that can illuminate aspects of the object, and not create a false identity between concept and reality, since this is a constant risk in

[1] We stress that on one hand, although the term "instrumental" automatically excludes song from the scope of our study, on the other hand it does not rule out current practices in popular music where the human voice is used as an instrument, including during improvisation.

studies that involve the behavior of music exercised by subjects endowed with subjectivity, and therefore, acting unpredictably.

Among the references used for building an analytical model are authors who use a systemic theoretical framework to deal with objects from different areas of knowledge. However, we look especially at studies in the field of improvised music (SARATH, 2013. BORGO, 2005) and the humanities (ANDRADE, 2011. BUNGE, 1976; 2001), since the interaction between subjects within a CIIPM implies an abstract scheme. Although the complexities of this object are beyond the reach of most analytical approaches (including the systemic treatment proposed here), observing their internal dynamics can offer insight into the complexities of this type of music production and its inherent relationships and interactions.

The concept of a system

From the systemic viewpoint used as our primary reference (BERTALANFFY, 1968), concrete systems are real, but can be conceived, described and explained in conceptual terms i.e., through models and theories, which is the objective of this paper: propose ways to analyze the CIIPM from a systemic standpoint. Such a study may help to understand not only various parts of this complex system, but also the logic of collective creation that imposes itself in this context, since order and organization lies in its apparent instability and unpredictability, which is where music emerges from the global behavior of conceptual elements and autonomous subjects in interaction.

To define the concept of a "system", we base our study on the approach of Bresciani Filho and D'Ottaviano (2000; 2004), and in complement, we use points proposed by Bunge (1976; 2001). Bresciani Filho and D'Ottaviano (2000), define a system as a set of elements that interact with each other to achieve a goal; a whole in which the parts have their own identity and a common identity. According to the authors,

> [...] a system can be initially defined as a unitary entity, of a complex and organized nature, constituted by a non-empty set of active elements that maintain relationships, with characteristics of invariance over time that guarantee its own identity. In this sense, a system consists of a set of elements that form a structure, which has functionality[2] (BRESCIANI FILHO; D'OTTAVIANO, 2000: 284, our translation).

Therefore, according to these authors, the structure of a system is the articulated set of the relationships between its constituent elements, and the workings of the system, the articulated set of activities of these elements (BRESCIANI FILHO; D'OTTAVIANO, 2004: 05).

According to Bunge (2001), a system is a complex object whose parts or components are stored together by some type of link. These links follow a logical element--in the case of a conceptual system, such as a theory, or in the case of a concrete system, such as an atom or cell.

[2] "[...] um sistema pode ser inicialmente definido como uma entidade unitária, de natureza complexa e organizada, constituída por um conjunto não vazio de elementos ativos que mantêm relações, com características de invariância no tempo que lhe garantem sua própria identidade. Nesse sentido, um sistema consiste num conjunto de elementos que formam uma estrutura, a qual possui funcionalidade" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 284).

The set of all relationships between the components of a system is its structure (organization). The author defines the concept of a complex system by means of an ordered triad: environment, components and relationships. Thus, a complex system consists of a set of anything that, in addition to relating to at least one other component, also relates to the environment that surrounds it.

The context of improvisation in instrumental popular music as a system

The CIIPM, systematically analyzed, comprises the actions of musical creativity developed in real time by the subjects (performers) by means of processes and mechanisms in an environment of Instrumental Popular Music (IPM) improvisation formed by joining the chorus and the genre (with its inherent grammaticality). In this context, music emerges from the interaction of subjects, usually without any type of supervision, performed by individuals involved in a collective experience of music making.

Morin states that "a system is a whole that takes shape at the same time its elements are transformed"[3] (2005: 146, our translation). Looking for an isomorphism with this rationale, we understand that the musicians involved in real-time delineation occurring in the CIIPM are unaware *a priori* of all of the characteristics of the final product of their performance, since, in the same way, the CIIPM (self-) organizes as the performance progresses. Decisions are being made at every moment and are influenced by the music occurrences that emerge from it. By appropriating Bunge's words we can then perceive a "temporally ordered sequence of events such that each member of the sequence becomes part of determining the next member"[4] (1976: 718, our translation).

CIIPM is a non-linear system since the relationships between the magnitudes of cause and effect are not necessarily proportional in any sense. A reharmonization proposed by the pianist, a rhythmic cell introduced by the drummer or a soloist motif that reverberates in the lines of other instruments playing in the environment can result in unique moments of interactivity, and even change the course of musical events of the piece being performed. Thus, small details in sound production or perception, when perceived or recognized by the subjects, initiate transformations in the music or its reception, so that the eventual outcome result is disproportionate to any initial causes (BORGO, 2005: 68).

The CIIPM has a great amount of information and, consequently, a large number of interactions occurring over time[5]. This extreme complexity does not have an underlying logic that justifies an *a priori* organization, and therefore impossible to predict the paths it will take. However, in the context treated here there is a degree of predictability due to the internalization of rules. The subject, in the field of culture, is endowed with subjectivity; its action is driven by internalizing the system's rules, but while internalizing, it acts with a wide range of choices since action is moved by intentions. Subjects create friction, distortions and deviations in behavior decreasing the degree of predictability of their actions.

[3] "[...] um sistema é um todo que toma forma ao mesmo tempo em que os seus elementos se transformam" (MORIN, 2005: 146).

[4] "[...] sequência temporalmente ordenada de acontecimentos tal que cada membro da sequência torna-se parte na determinação do membro seguinte" (BUNGE, 1976: 718).

[5] Being an irreversible medium, it is the notion of time that supports the creation of complexity and the possibility of the emergence of properties in a system (BORGO, 2005).

CIIPM is a complex organization with emergent properties[6] where there are structures for which we associate a certain degree of unpredictability and a multitude of chance factors that can occur, making this system unpredictable, but not necessarily chaotic or random. The fact that all chance factors and their influences are unpredictable does not mean the system's self-organization is totally undetermined, especially since the unpredictability of IPM improvisation is, in a sense, constrained by the principle of grammaticality inherent to the music genre comprising the creative environment. Accordingly, we consider the music genre a factor that, in some way, organizes the unpredictability of improvisation in CIIPM. There is some expectation as to how musicians will act in this context, since the system, although unpredictable, is not random. Based on Andrade's (2011) ideas, we acknowledge that CIIPM contains a set of rules–implicit and explicit–and conventions–personal, social and cultural–capable of establishing a field of behavior.

One of the main factors that differentiate IPM improvisation from free improvisation is the grammaticality[7] to which performers are subject in CIIPM. The improvised solo, as well as the accompaniment patterns that are improvised by the entire group (BERLINER, 1994), can adhere to the grammatical directions implicit in the genre being played. The grammatical parameters occurring in the CIIPM are the same as in "non-improvised" music, so much so that the concept of grammaticality, so important in some aesthetic currents, comes from the approach of the patterns of the "non-improvised" music of a particular genre, like *frevo*, for example. After all, the subject acting in CIIPM is not totally free, but acts on a long history of popular music. Elements that make up the baggage of improvising musicians are previously incorporated grammars, their repertoire, habits and memories, that is, that which naturally favors the appearance of certain music information.

Following this reasoning, improvisation in *frevo*, for example, will have a greater degree of grammaticality should patterns found in "traditional" *frevo* melodies be present during the construction of a melody; however, these patterns must make reference to the genre in question, both to other musicians and the public. With reference to the grammaticality of a genre in "non-improvised" music, we can say that the level of grammaticality in music improvisation decreases, but flexibility in the system's organization increases.

Thus, in certain "socio-musical" currents, the improviser is expected to have at least part of the music elements of his musical discourse to be relevant to the genre played. It is not our intention here to discuss the area of coverage of a music genre, but as a rule, musicians share a common knowledge, based on discographic references (which usually vary between one social group and another), about which elements sound like they "belong" or are "closer" to a particular genre.

We believe that certain rules and repertoire comprising some genres are more "restrictive" e.g., the essentially tonal harmony inherent to *frevo* found in the arrangements performed by the Orquestra de Cordas Dedilhadas do Recife (Plucked String Orchestra of Recife), while others are more "free" e.g., the harmonic construction of the *baiao* that allows tension and reharmonization to be inserted, e.g., Hermeto Pascoal's approach to this genre. In addition, we understand that the approach to the genre's grammar during improvisation is also

[6] Properties resulting from interactions between elements united by a systemic context.

[7] For this paper, we adopted the term "grammaticality" used by Cleide Martins (1999), a researcher in the field of dance. Here, it means a set of music elements governed by rules or laws inherent in a music genre, leading to the occurrence of certain connections.

one of the most important elements in the amount of freedom one has in real-time creation. Thus, shared musical and cultural knowledge play an important role in the interaction between musicians who improvise together.

Improvisation is a form of organization of the discourse musician's deal with in real time, dosing "restrictions and non-restrictions" (MARTINS, 1999), a combination that varies according to the grammar of the genre played. Performers are "language agents" (COSTA, 2003), and the way in which the genre's main elements emerge and how the subject will combine these restrictions varies according to their experience. According to Kenny and Gellrich (2002: 117), a common feature of any improvisation is that the creative decisions of performers are made within the constraints of the performance itself. In the CIIMP, when musicians have great freedom while playing in a group, it is because the system provides sufficient skill and communication to be able to select proper constraints in the course of the piece (BORGO, 2005: 19). As Michaelsen (2013) states, in most forms of improvisation, there are several constraints that provide musicians the limits within which they operate. Instead of restricting creativity, these limits allow certain aspects of their performance to be taken for granted, and do not require an additional cognitive load, allowing for greater creativity in unrestricted areas.

Properties of the system

So that the notion of system can illuminate aspects of CIIPM, we rely on nine of the fourteen basic precepts for the systemic approach proposed by Bresciani Filho and D'Ottaviano (2000: 304). From the evidence observed in IPM improvisation, we seek to use the elements proposed by the authors to construct a theoretical framework that supports the reflection on the object in question. We highlight in bold the text or keywords deemed important to understanding each element and are the parameters on which we based our work.

(1) The CIIPM consists of the subjects (performers), the genre and the chorus in which the improvisation is developed. Relating to the elements that comprise the environment (genre and chorus), the subjects mutually interact and influence with the intention to organize the performance and the music that is developed in real time. According to Bresciani Filho and D'Ottaviano (2000: 304) it is required "the existence of a system with an underlying structure, constituted by a set of elements and by the relations between these elements, and with a functionality"[8].

(2) In the CIIPM, the guiding light for the emergence resulting from the interaction between subjects is the conditions of the environment and the various forms of interaction. The simple sum of the parts does not represent the system. This property in CIIPM has been denominated **synergy**, defined by Bresciani Filho and D'Ottaviano (2004: 03) as the property of the system in which "the whole is more, or less than the sum of the parts", being that "systemic synergy can be considered the first property that arises in the constitution of a system" (2004: 03). The synergy (communication efficiency) of the system can be positive–in the case when the whole is more than the sum of its parts–or negative, when the whole is less than the sum of its parts (BRESCIANI FILHO; D'OTTAVIANO, 2000).

[8] "[...] a existência do sistema com uma estrutura subjacente, constituída por um conjunto de elementos e pelas relações entre esses elementos, e com uma funcionalidade" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 304).

Moreover, the property of **globality** also exists in the system discussed here, defined by Gasparian as the condition in which "each and every part of a system is so related to other parts that changing one will cause change in others and, consequently, change the total system"[9] (1997: 27, our translation). In CIIPM, globality is evidenced in situations where the entire system is reconfigured from a "combinatorial ignition" proposed by a subject. This mechanism may occur as a consequence of using a musical resource such as metric modulation, reharmonization or a change in genre, indicating that subjects exist in multiple interactions, relationships and reciprocal connections, mutually connected and interdependent.

By applying the concept of "combinatorial ignition" in the model proposed, we deem it relevant to employ the notion of musical gesture in order to amalgamate the corporality implicit in the interaction between subjects. As Cirino (2005) states, the expressive material used in musical performance goes beyond the acoustic result, indicating intersections between the musical material itself and other components such as gesture, speech and movement.

With respect to the notion of musical gesture, Robert Hatten's syllabus of a course he taught at Indiana University entitled *Musical Gesture: Theory and Interpretation* provides the following definition:

> Musical gesture is biologically and culturally grounded in communicative human movement. Gesture draws upon the close interaction (and intermodality) of a range of human perceptual and motor systems to synthesize the energetic shaping of motion through time into significant events with unique expressive force. **The biological and cultural motivations of musical gesture are further negotiated within the conventions of a musical style** [...]**.** Musical gestures are emergent gestalts that convey affective motion, emotion, and agency by fusing otherwise separate elements into continuities of shape and force (HATTEN, [n.d.]).

In the context of group musical creation, the elements do not function independently; for emergence to result as a cohesive and interdependent whole, a global connection is required that is related to the property of **novelty**. We consider unplanned musical events resulting from interactions in the system are new musical materials (in that context). According to Bresciani Filho and D'Ottaviano (2000: 304), "the existence of properties of synergy, globality and novelty" is a condition for the characterization of an object as a system.

(3) In this study, the researcher is considered a **subject** that is required to characterize CIIPM as a system. It is an external element, "an observer of the system of a complex nature" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 305) that "establishes a relation with the object of study through reflection, speculation, observation and experimentation" (BRESCIANI FILHO, D'OTTAVIANO, 2000: 288), seeking "to find organizational qualities in the object that characterize its existence, structure, functionality and possible evolution"[10] (BRESCIANI FILHO; D'OTTAVIANO, 2000: 288, our translation).

[9] "[...] toda e qualquer parte de um sistema está relacionada de tal modo com as demais partes que a mudança numa delas provocará mudança nas demais e, consequentemente, no sistema total" (GASPARIAN, 1997: 27).
[10] "[...] um sujeito observador do sistema, de natureza complexa [...] que estabelece uma relação com o objeto de estudo através de atividades de reflexão, especulação, observação e experimentação [...] buscando

(4) In the system discussed here, it is possible to recognize different degrees of complexity among the constituent elements. The subjects are the most complex elements since their experience is highly personal influencing the language, idioms and systems that form their musical history (COSTA, 2003). The genre and the chorus, which constitute the environment of improvisation itself, present different complexities and are explained in subtopic 4.1 of this paper. For the systemic approach, according to Bresciani Filho and D'Ottaviano (2000: 305), the "identification of relations of different degrees of complexity between the elements of the system"[11] (our translation) is necessary.

(5) In CIIPM, we can identify a set of elements (genre, chorus, subjects) and their relations/ interactions. We can also observe an articulated set of activities of the subjects that "lead the process of transformation by exercising functions dynamically, but conditioned by the **structure**" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 293) that defines its **functioning**. According to Bresciani Filho and D'Ottaviano (2000: 293), "the set of structural and functional characteristics of a system identifies its **organization**"[12] (our translation) that drives the behavior of the system.

(6) CIIPM is configured with the purpose of generating music, so that the performance is concomitant to creation; thus, indeterminations with respect to performance are stronger and more present than determinations. The elements that constitute the system coordinate/are coordinated to achieve this objective and confer **teleological property** to this object, which is associated by Bresciani Filho and D'Ottaviano (2000: 295) to "a process essentially dependent on the conditions that will arise during the development of this process"[13] (our translation).

(7) Within the system discussed here, we can identify various distinct flows of activity characteristic of the *modus operandi* of a group of musicians that improvise in IPM. In this musical context, there is a field of influential forces represented by the determinations that exist *a priori* in the performance and by the musical references from the subject's experience. According to Bresciani Filho and D'Ottaviano (2000: 298), **there is a field of influence (or forces) in the system to provoke a stream of activities**, and "these streams are articulated among themselves and are responsible for the activities, capable of altering the organizational stability of the system"[14] (our translation).

(8) We consider that in most cases, the CIIPM is a **self-organized system**, since there is "interaction of the predetermined activities of the system with the autonomous and spontaneous activities of the elements of the system in a recurrent process"[15] (2000: 305, our translation). The elements that make up the CIIPM have *a priori* certain determined functions, but it is the indeterminate that guides the direction the system will go; like a mobile, the elements adjust to

encontrar qualidades de organização no objeto que caracterizam a sua existência, estrutura, funcionalidade e possível evolução" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 288).

[11] "[...] identificação de relações de distintos graus de complexidade entre os elementos do sistema" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 293).

[12] "[...] o conjunto das características estruturais e funcionais de um sistema identifica sua organização" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 293).

[13] "[...] um processo dependente essencialmente das condições que surgirão durante o desenvolvimento desse processo" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 295).

[14] "[...] esses fluxos são articulados entre si e são responsáveis pelas atividades, podendo alterar a estabilidade organizacional do sistema" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 298).

[15] "[...] interação das atividades predeterminadas do sistema com as atividades autônomas e espontâneas dos elementos do sistema em um processo recorrente" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 305).

organize the system, and the emergence resulting from the interactions between the subjects guide this process of organization.

(9) It is inherent to this system the activity of real-time creation by the subjects, as well as the manipulation of other elements to the "**possibility of transformations through creative processes, which may be due to the phenomenon of self-organization**"[16] (BRESCIANI FILHO; D'OTTAVIANO, 2000: 305, our translation).

Ordination and organization. To be able to understand the particularities inherent in a CIIPM, we must differentiate ordination from organization. We understand order as a property, and organization as an emergence of the system. In improvisation, organizations are created; they are products of the relationships between elements. As a rule, improvised music has a lower degree of ordination than written music. We can regard improvisation as being a less organized form of music organization and, although the organization parameter is present, there is a tendency that in improvisation there is a lesser degree of ordination of the elements if compared to "non-improvised" music. In addition, we believe that in situations where there are musicians who have a similar experience of improvising together, the performance is not ordinated, but is organized, with greater synchrony of musical events. Bresciani Filho and D'Ottaviano (2004), in corroboration with Morin, (1997) define organization as an essential characteristic of each system, and order as a particular characteristic of certain organizations. The relationship between the structures of a system may or may not respect some degree of order, and there are organized systems that have no orderly relation in their (organized and disorderly) structures.

As mentioned previously, we consider the interaction between performers as being part of an organizational mechanism of the CIIPM. According to Bresciani Filho and D'Ottaviano (2004: 05), the organization represents the relationships and activities or functions of a system, having the capacity to transform, produce, gather, maintain and generate the behaviors that it presents. For the authors, the organization can be identified from the characteristics of the structures and functions of the system. In this way, a system has structures and functions that are related and interdependent. The understanding of the organization of a system is in the identification and understanding of the structures and functions that comprise it, as well as of the interaction between them. It is what we seek to establish here: undertand the procedures existing in a CIIPM through the broadest possible understanding of its musical procedures.

The musician who joins a group to improvise in IPM, somehow seeks to amalgamate with other performers, whether in terms of tone, rhythm or simply through an intuitive quest to interact with the existing musical procedures. According to Leitão (2009: 36), in its process of organization, a system may have strengthened or weakened identities of the parts and/or the identity of the whole; of the whole of the parts, and/or parts of the whole, so that its organization will reflect its identity. The organization is then "the internalized face of the system (interrelations, articulations, structure) and the system is the externalized face of the organization (form, globality, emergence)"[17] (MORIN, 1997: 139, our translation).

The improvised musical discourse addressed here is a process that occurs in the CIIPM, in which the relation of subsystems (subjects and environment), through time, undergoes stochastic

[16] "[...] possibilidade de transformações através de processos criativos, que podem ser decorrentes do fenômeno de auto-organização" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 305).
[17] "[...] o rosto interiorizado do sistema (inter-relações, articulações, estrutura) e o sistema é o rosto exteriorizado da organização (forma, globalidade, emergência)" (MORIN, 1997: 139).

modifications. This process directs the system to (self-)organization. In this context, there are collective procedures that arise independent of the initial state of the environment, such as formal expansion, changes in genre, meter or harmony. According to Morin (1996), self-organization is a phenomenon present in systems, which refers to its ability to create new structures and internally establish a new level of organization. Thus, the concept of self-organization is another point of support for our reflections.

Self-organization. Regarding the systemic property of self-organization that we will discuss in the following subtopic, we begin with Debrun's definition (1996: 04) that states:

> There is self-organization whenever the advent or restructuring of a form, throughout a process, is mainly due to the process itself–characteristics intrinsic to it–and only to a lesser extent to its initial conditions, [...] to the eventual presence of a supervisory body[18] (our translation).

In the literature that deals with musical improvisation, Sarath (2013), Jong (2006), Borgo (2005) and Barret (2000) already work with the concept of self-organization. For Jong (2006: 19), people self-organize as a group when their own dynamics regulate the activity within the group as well as interaction with the environment. According to Sarath (2013: 210), a system is self-organized to the extent that its development is conducted internally, with minimal dependence on external inputs.

Borgo (2005) argues that freer forms of improvisation may be closer to the idea of self-organization, since the structures of improvisation can be extended infinitely (although the system is circumscribed, at least in part, by the abilities, materials and experience of the performers). Sarath (2013) interlaces considerations regarding the idea advocated by David Borgo (and also by other artist/researchers dedicated to free improvisation). To Sarath, there is no reason to say that improvisation in formats based on a referent[19] (like jazz) cannot achieve high levels of self-organization, since performers who use their creativity in these formats are able to invoke the same degree of self-organization in their respective areas of performance that performers achieve in free improvisation. We recognize that Sarath's understanding of this subject encompasses a broader field of musical improvisation.

In general, in IPM improvisation there is no supervisor: a subject who directs the soloist and the musicians of the rhythm section, or who provides guidelines for the interaction between subjects, and hence the emergence of different musical dynamics. The soloist plays the closest role

[18] "Há auto-organização cada vez que o advento ou a reestruturação de uma forma, ao longo de um processo, se deve principalmente ao próprio processo – as características nele intrínsecas -, e só em grau menor às suas condições de partida, [...] à presença eventual de uma instância supervisora" (DEBRUN, 1996: 04).

[19] The term "referent" is used in the literature on improvisation to capture the wide variety of music materials that improvisation may be based upon. Jeff Pressing (1984: 346) introduced this term, defining it as "an underlying formal scheme or a specific guiding image for a particular piece, used by the improviser to facilitate the generation and editing of improvised behavior on an intermediate time scale." As Michaelsen (2013) states, Pressing's definition is intentionally broad, to encompass the enormous variety of possible referents. While the lead sheet and the arrangement are common references in jazz, a referent could be the principles that guide the improvisation of a cadence in a classical concert, an abstract image used to induce a collective, free improvisation, or a raga for a performance of classical Indian music. For Michaelsen (2013: 90), "the referent forms an essential domain of interactional activity for a performance [...] and operates like an invisible band member, influencing the utterances of the musicians."

to a hierarchical relationship, since, *a priori*, it is he/she who directs the main paths, directions or tips for the next actions. Therefore, we consider self-organization as being compatible with rules, represented in the CIIPM by the musical genres and the subject's habits. In this field, the rules would more likely recommend the course of behavior of the subjects in relation to musical genres, instrumental combinations and situations lived, and less likely to strictly adapt a musical group to a set of rules. Self-organization in this context is primarily the result of the autonomous actions by the subjects, who have the free will to integrate, propose, oppose or perform any other musical action they deem pertinent in real time. In the game established in this context, subjects make decisions without supervision.

Through direct and indirect interactions between subjects, and between subjects and the environment, groups working in a CIIPM may self-organize in a decentralized and flexible manner. In a context of improvisation where there is a high degree of interactivity among performers, protocols of communication [20] for changes in "musical dimension" (that may include reharmonization and changes in meter, dynamics and genre) are indicated mainly by the subject who, at that moment, is responsible for elaborating an improvised solo. However, the musicians in the rhythm section may also be responsible for indicating direction, inducing the soloist.

Thus, subjects establish relationships of interaction based on internally determined relationships, where some subjects may exert more influence. In this context, according to Debrun (2009: 62-63), when the boundaries between subjects are ambiguous and imprecise, even if there is hierarchy, the relationships established are not of domination, but influence. This relative hierarchy emerges as the "organizing" ingredient of the system, since habits that would lead individuals to conflicting musical strata can often be managed in deference to the soloist or to the leader of the group.

As Debrun (2009: 62) asserts, because of the relative autonomy of the parts, the principal parts can only exercise over others a hegemonic, but non-dominant role. For Debrun, the hegemonic role, more "organizer" than "organizable", of certain parts e.g., the soloist with respect to the instrumentalists in the rhythm section, means that the parts lead and direct, yet must make requests, not impositions. These suggestions e.g., change a genre + tempo (from a *baião* at 75 bpm to a samba at 150 bpm, will be "evaluated" by the other "parts" (rhythm section that performs a *baião* at 75 bpm), and what will in fact take place and to what degree (a change in genre and tempo, or just genre) will depend on a complex adjustment between the "leading parts"– "hegemonic, but not dominant"– and the "conducted parts". For self-organization to occur, there must be interaction, not just strict conditioning among subjects, endowed with some degree of freedom who find themselves as possible participants in a process; a condition that counterposes a "self" from a "hetero" organization (ANDRADE, 2011: 83).

CIIPM is an emerging system, since the correlations and interactions that occur in it are established by the influence of the elements that constitute it, due to the existence of interaction strategies from which complex and self-organized collective behaviors can emerge. According to Bresciani Filho and D'Ottaviano (2004: 10),

[20] In this work, we use the expression "protocols of communication" standing for the information shared between subjects that comes from the common experience shared by musicians working in the context of popular music, or even from other prior combinations. Not only musical actions, but also body gestures can can be part of a protocol of communication between subjects.

> [...] The spontaneous activity stems from the existence of a minimum degree of autonomy of the acting elements. In turn, recurrent processes need to be present, so that the autonomous elements, in their activities, integrate into an organization with self-reference. The predetermined changes may be concurrent or consistent with the spontaneous changes or complementary and facilitative changes of the latter[21] (our translation).

We believe CIIPM exhibits secondary self-organization; characterized as such when there is identity at the starting point and the system learns with noise and restructures itself in a learning process. According to the point of view presented by Debrun (1996: 11), this identity will guide systemic relations. In the environment discussed here there are certain predicted musical parameters that outline the initial situation that the musicians will use as a reference, like the genre and the chorus; they are the given conditions represented by the instructions contained *a priori* in this type of situation. However, in certain musical contexts that vary according to the genre and the references in mind for the aesthetic conception of music making, harmony changes (by means of innumerous procedures of reharmonization, standardized or not), tempo doubles, form extends and even genres change.

Ideally, all changes that arise in the CIIPM result from the dynamics of interaction that occur in real time, and the conceptual elements that sustain these changes are *sine qua non* in the performer's baggage. This emergence occurs naturally and characterizes CIIPM as a self-organized system. The starting conditions (theme, genre, tempo and harmony) play an important, yet supportive role, when we regard them as being characterized more as a pretext for improvisation.

Implicit to CIIPM during the process of musical creation, is the freedom that performers can take to completely re-route the initial direction of the performance. Thus, in this context, the phenomenon of self-organization is not merely a consequence of the initial configuration of the system; self-organization occurs from the manipulation and, above all, the modification of the initial conceptual elements inherent to the environment (the "starting conditions"). This process is operated by the subjects, giving rise to multiple solutions and strata of music. In this way, the system goes beyond its starting conditions from its ownself. In certain contexts of IPM improvisation, self-organization is concerned with an autonomy relative to the initial conditions, which does not imply indeterminism present in free improvisation, for example, but in a capacity and autonomy to deconstruct a certain musical situation established *a priori*.

Finally, we consider it difficult in IPM improvisation to affirm how the presence of a group leader in the system influences the process of self-organization; since in a context where subjects have their own idiosyncrasies and subjectivity, the collaboration between performers flow through bonds of trust established by being together (not only musical, but interpersonal). It is a question of interpersonal relations, which cannot be mapped with the use of Systemics in its pure form. In general, we believe that the influence of the leader is most clearly exercised in rehearsals and conversations, opportunities where it is possible to pause a performance to give instructions to the instrumentalists. Although it is possible this influx can occur in live shows, appraising such a

[21] "[...] a atividade espontânea decorre da existência de grau mínimo de autonomia dos elementos atuantes. Por sua vez, os processos recorrentes precisam estar presentes, para que os elementos autônomos, em suas atividades, se integrem em uma organização com auto-referência. As mudanças predeterminadas podem ser concorrentes ou concordantes com as mudanças espontâneas, ou ainda, complementares e facilitadoras dessas últimas" (BRESCIANI FILHO; D'OTTAVIANO, 2004: 10).

performance is more subjective. During a performance, the relationship with a subject that has a status of "authority" in the system is an extra-musical interaction that can become musical, since it is possible that it influences, in some way, the choices of a musician.

Subsystems

According to Bresciani Filho and D'Ottaviano (2000: 285), "subsets of the universe of the system may constitute subsystems of the general system"[22] (our translation). Thus, the subsystems chosen are elements of CIIPM: subjects (performers), the environment, genre (constituent part of the environment) and styles. The performer is a subsystem that conducts the music mechanisms and grammaticalities of the genres, making use of his/her style for such a purpose. In addition, the musician performs combinational ignitions that may reverberate through the system. One of the most relevant experiences to integrate the knowledge and experience of the improvising musician is his ability to manipulate the grammaticalities and processes inherent in musical genres, which, conducted in a particular way, is an important characteristic of his/her style.

Styles can be considered "intra-performer" subsystems. They are formed by the personal atrributes, particularities and forms of manipulation of the information absorbed during the performer's developing years. Despite the possibility of having information shared between performers who have similar artistic profiles, the way in which the performer processes and subsequently "customizes" retrieval of this information in the medium varies from musician to musician.

Styles can still be regarded as implicit subsystems within a particular collective musical context. This may be the setting where the group leader gains importance, as in the emblematic cases of Miles Davis and Hermeto Pascoal, for example. The group has a "face", a style, and curiously, the group configuration can change by replacing musicians, changing instrumentation and various other situations that can be included in the performance, but the style of the collective musical situation remains alive and essentially the same, should we analyze a period of time when the band leader himself did not radically alter his own aesthetic concept.

In this work, we denominate musicians acting in CIIPM as subjects, which are subsystems. The dynamics of interaction between the subjects generate emergence in the system, organizing the appearance, threads and overlaps of conceptual elements (genre, grammaticality, styles, mechanisms and habits). In this context, the subjects can basically perform two distinct functions that vary according to the group structure: soloist (responsible for producing an improvised solo) or musician of the rhythm section (who can interact with the soloist, completing his/her ideas and suggesting others). However, in improvisation–an environment in which conception and action are indivisible–all subjects acting in the environment are responsible for actions of creation and execution in real time. In this way, the function of the subjects varies temporally, mainly because the responsibility for elaborating the improvised solo is transferred between musicians. The soloist, in a certain way, can delimit the directives of the system during his solo, characterizing a type of hierarchical relationship between subjects, which is already implicit in the functions delimited between the musicians.

[22] "[...] subconjuntos do universo do sistema podem constituir subsistemas do sistema geral" (BRESCIANI FILHO; D'OTTAVIANO, 2000: 285).

There are several modes of interaction that permeate between these two categories; and the functions that the subjects will perform are not totally compartmentalized since all musicians may perform both functions. This varies over time according to the events, processes and hierarchical relations (who is the soloist) prevailing in the context of improvisation. Subjects can make multiple decisions and each one can act as a distinct combinatorial ignition for what will occur in the system.

The environment. The environment is the territory where music happens. It has its grammaticalities brought by music genres that somehow mechanize it. To Costa, in the constitution of the environment of improvisation called idiomatic[23],

> [...] there are extramusical, geographical and historical references that condition the uses and functions of this practice, and in addition there are musical elements themselves that interact continuously, such as sound materials and their musical organization in scalar, harmonic and rhythmic systems[24] (COSTA, 2003: 76, our translation).

In the composition of the environment where IPM improvisation is performed, there are two subsystems that permeate and provide the necessary substrates both for the creation in real time and for the relationships and interactions inherent to this musical practice: the chorus and the genre.

The chorus is a formal harmonic structure that is cyclically reiterated and used in improvising solos in an IPM performance. The very word chorus is, in this socio-aesthetic-musical context, synonymous with "section of improvised solos". Originally, the term refered to a complete repetition of the formal harmonic structure of the subject on which improvisation is performed, and in IPM, this approach is the most commonly used. However, we can verify– both in discography and from observations *in loco* of live IPM performances–that a section of improvised solos of a song (the chorus) may not be limited to the structure of the theme. It is common to use a formal harmonic scheme exclusively for developing the improvisation, a type of "annex" having different characteristics of the theme.

We regard the chorus as one of the most important elements of the organization (and perhaps even mechanization) of IPM improvisation. In this practice, there are even standardized formal-harmonic templates (FREITAS, 2010) where structural organization and subdivision is defined as sections, such as 12-bar blues, rhythm changes, and the AABA 32-bar song form.

There are cases when the chorus is not pre-established to the theme, nor do musicians agree upon a form before a performance. In certain scenarios, it is normal for the group leader to determine unscripted improvised solos. In this way, the musicians involved in the process delimit,

[23] The author defines idiomatic improvisation as "that which occurs within the context of a musical, social and culturally delimited historical and geographical idiom, like for example jazz or an improvisation in hindu music" (COSTA, 2003: 36). We opt to give voice to definitions such as these since we regard them as contemplating a signficant part of the set of practices and concepts we decided to classify as "instrumental popular music improvisation".

[24] "[...] existem as referências extramusicais, geográficas e históricas que condicionam os usos e funções desta prática, e, além disso, há os elementos propriamente musicais que interagem continuamente, como os materiais sonoros e sua organização musical em sistemas escalares, harmônicos e rítmicos" (COSTA, 2003: 76).

also in real time, the "territorial" conditions in which improvisation will be introduced. This type of "improvised territorial delimitation" depends even more on the "rapid visual, tactile and proprioceptive monitoring of actions" (PRESSING, 1988) of musicians, who, through conscious and unconscious reactions to sound stimuli, must automatically resort to resources from their toolbox of experience, so that the interactions established in the context of musical creation actually have a creative functionality.

The environment of IPM improvisation also includes the genre and its inherent grammaticality. Improvisation is developed more frequently on genres already standard in popular music. The genres can be considered as subsystems of the IPM improvisation environment that, although they depend on the performance of musicians (how instrumentalists deal with these subsystems), are part of the internalized knowledge of all subjects (assuming a standard situation where musicians share common material in their baggage of resources, like the standard repertoire of IPM, jazz phraseology, rhythmic elements of Brazilian music, etc.).

Interaction between performers

According to Borgo (2005: 138), all musical performance involves, in its own way, the process of synchronization actions, intentions and sounds. In this subtopic, we approach the interactions that take place among musicians under the influence of the conceptual elements that form the environment (genre and chorus).

The interaction between performers (subjects) is a form of organization of the CIIPM (system). With each combinatorial ignition proposed by one of the subjects, the whole system must be reconfigured, creating several paths for the subsequent organization. Each combinatorial ignition suggested by a musician allows the whole system to communicate, organizing itself in function of this new adjustment, which, if on one side supplies the system, on the other destabilizes it. In a way, the interaction dynamics are destabilizing processes of the system, because, with each new combinatorial ignition, the whole system acquires new configurations, in a process of constant transformations.

The interaction can still be considered a potential agency between subjects or the possibility of two elements of the system having a relationship of communication. To establish communication, a type of protocol is necessary. In regard to interaction between subjects, the definition of interaction refers to a two-way path of communication between subsystems (PRESSING, 1988). Rinzler (1988: 156-157 apud MICHAELSEN, 2013: 19) groups interactions in jazz into the following common patterns: call and response, fills, accenting the end of formal units, common motive, and responding to the peaks of the soloist. We believe that such interaction dynamics also occur in Brazilian popular instrumental music.

The interaction dynamics in CIIPM can present themselves in many ways. The musical discourse of the soloist is permeated by the suggestions that come from the musicians of the rhythm section, just as the actions of the base musicians are directly influenced by the soloist's musical discourse, and this dynamic process takes place the entire time.

Michaelsen (2013: 49) defines interactions as moments of intervention in which the collision of two separate streams results in an alteration of either or both of their paths. In the case of IPM improvisation, each musician, through the creation of a "stream", will suggest a possible continuation or an area of continuation during each moment of the unfolding music. If a

musician's statement causes another musician to deviate from the continuations suggested by his previous statements, then an interaction occurred. In certain situations, the actions performed by the subjects "meet" and form a single musical event. When two or more actions improvised by different subjects are unified and are in the same space/time an event[25] has been constituted.

Based on the assumption that in IMP improvisation the "accompaniment" patterns are also improvised at all times, forming a permeating, complex range of musical information (BERLINER, 1994), the point is in the connection between the improvised solo and the accompaniment (also improvised). They connect, but *a priori*, this relationship is, in a sense, hierarchical, since there is a protocol in the common knowledge of IPM where information in the improvised solo determines the operation and direction of the context, and consequently of this connectivity.

When the performer joins his/hercollegues for a performance in a CIIPM, he/she may perform musical actions that the performer would not present in another situation, since the interaction between the musicians acting in this context causes the emergence of musical elements. Between a joint performance and a solo performance (in a rehearsal session an *a capella* performance, or with playback, for example), it is probable (and even desirable) that the same musician exhibits different behaviors. Such a condition clearly indicates the fact that, in certain circumstances, decisions regarding articulations, inflections and dynamics (among other resources of interpretation/nuance of instrumental performance) may not only come from the musician, but from his/her interaction with other performers. This is a property of a music band, bringing forth music behaviors and actions casued by interactions between subjects, as well as the musician's relationships with the conceptual elements that structure the system. For this rationale, we begin with Morin's definition of emergence (1997: 104), which states that "We can call emergence the qualities or properties of a system that are novel in relation to the qualities or properties of components considered alone or arranged differently in another type of system"[26].

In this way, IPM improvisation reveals some emerging properties. Such emergence results from the conjunction of a number of factors, since in improvisation there is the "merging of a variety of aspects of a given time and place of performance" (SARATH, 2013: 207). In addition, even before the musical performance itself, a process of collectivization can occur in the extra-performance context, since some interdependence between musicians is already manifested in the coexistence, conversations and artistic affinities that arise during the extra-musical interactions between subjects. There is mutual adjustment to the presence and activities of musicians among themselves; and in favorable situations, the property of positive synergy and the capacity of self-organization of individuals will stand out.

We believe that in CIIPM the interaction between musicians is a condition for the system to expand its musical possibilities. In an ideal situation, musicians, preoccupied with interacting with other performers, seek, above all, to listen and perceive what is happening in the context to musically position themselves; they act coherently with the contrapuntal scheme

[25] Bunge (1976: 718) caracterizes as an event as anything that, even if only for a small moment in time, has a place in space/time, and in some way, is considered a **unit**.

[26] "Podemos chamar emergências às qualidades ou propriedades dum sistema que apresentam um caracter de novidade em relação às qualidades ou propriedades dos componentes considerados isoladamente ou dispostos de maneira diferente num outro tipo de sistema" (MORIN, 1997: 104).

formed by the improvised solo and the musical gestures of the rhythm section. In order for this process to take place, a "state of tactile, visual and auditory readiness" (COSTA, 2003) is required of the musicians, i.e., a pre-disposition to the game of improvisation, as well as to its interactive implications. As stated by Borgo (2005: 81), musical improvisation certainly requires focused listening, quick reflexes and extreme sensitivity to group flow, which corroborates with Pressing's (1988) reasoning about the complexity of skills needed for improvisation, which involves both motor and perceptual components.

As Bresciani Filho and D'Ottaviano (2004) argue, a fully functioning system is drawn at all times to a configuration of equilibrium or disequilibrium. A context where improvisers continually test boundaries and take on the responsibility of making these lines more flexible, is above all a system where interactions are preponderant to the organization. In IPM improvisation the interactions between subjects can not only destabilize, but also "disintegrate" the system in question and its inherent grammaticalities and mechanisms. However, even when, during a solo, the group completely modifies the conceptual elements of the starting conditions of the CIIPM (for example, altering the genre, meter and harmony), at the end of an improvised solo, in most cases the tendency is to restore the initial conditions. In this way, the next improvising soloist has new ground to expose his/her musical ideas.

Feedback. So that interaction between subjects can occur, feedback is required as part of the communication protocol inherent to CIIPM. Sarath (2013) defines feedback as the means by which a system or a component of a system assimilates and responds to information from another component or system. Pressing (1984) states that visual, sensory, and tactile feedbacks reinforce each other for improvisers, and are important for the motivation of subjects. As Sarath (2013) argues, the feedback mechanism in improvisation is important because musicians must perceive and respond to constant flows of information; information flows through the feedback mechanism and the system integrates. When feedback is strong, more information flows and therefore a wide range of interactive factors can unify the parts of the system. When feedback is weak, the range of unifying factors is limited and the system remains fragmented. The more robust the feedback mechanism, the more information can flow and unify the various components of the system. These components directly determine the properties of self-organization. Sarath believes that proficient musicians exhibit feedback qualities in their ability to adapt to the spontaneous fluctuations of the music environment in which they perform e.g., when they reinforce the direction of the music proposed by other musicians, they work together to support one another's ideas and shape the group's sonority.

In addition to the feedback mechanism among performers, there is feedback from listeners in the case of a live performance. To Sarath (2013), musicians generate ideas that engage and integrate listeners into the creative process, and in turn, listeners return information of various kinds to musicians further enhancing the flow of communication and system integration. To Sarath, the participation of the listeners as dynamic collaborators, rather than passive spectators, is of particular relevance to improvisation. Listeners generate superficial information in the form of applause, movements, verbal gestures of approval, laughter, and when less engaged, fidgeting or coughing, which has a potent effect in situations where listeners are more numerous than performers.

The role of habit

To Berliner (1994), the less automated the discourse of the improviser, the more interesting it is; ideally, the improviser seeks to disengage from the connective automatisms memorized during his practice time so the stochastic mode of real-time choices in music may appear. However, although the musician exhibits in the performance a succession of previously unplanned musical actions, as Martins (1999: 82) states, the improvising artist is "always a prisoner of his/her acting." The likelihood of a subject exhibiting a completely unpredictable and random behavior is low, and this is precisely one aspect of the musician's style: the ability to identify his most recurring actions, whether composing, interpreting or improvising. This brings grammaticality to the system, because certain choices are prioritized to the detriment of others, and one of the properties of the mind that enables this is the tendency to form habits.

The action of habits is inherent in improvisation. Certain phraseological actions, melodic combinations and music reactions to diverse stimuli appear and reappear in the performance of every musician. As Peirce (1962) defines, habit is a disposition to act in certain ways in certain circumstances, especially when the subject is animated or guided by other motives. Habits are actions that are reiterated, that repeat themselves, creating a tendency to repeat themselves in the same way.

Despite all the unpredictability and complexity inherent in IPM improvisation, and the subjectivity inherent in the subjects acting in this context, it is possible to verify regularities in the overall behavior of an artist, or even a group of musicians. Such regularities are determined, among other factors, by some tendencies acquired or constructed in the exercise of artistic life: habits. Thus, the resourcefulness and competence with which a subject improvises and interacts with peers may, in part, constitute an emergent property of their habits, which manifest as regular behavioral courses over time. In the context of music improvisation performed in a group, the habit can still play a significant role in the performance expectations of the performers, influencing the interaction and the synergistic reflexes that emerge from it.

Andrade (2011) observes that a habit is characterized by a relationship between circumstantial antecedents and behavioral consequents; thus, "who" the subject is cannot fail to be given, at least in part, by the conjuncture in which it is inserted. As Andrade claims, it is as if a portion of the subject's identity were updated by the circumstances of a context, since behavior would be the way in which it would respond to those situations. However, it is important to note that in music improvisation, although subjects have habits, there is always randomness in the correlation between a given event and a line of behavior adopted by the subject, which carries its own subjectivity and its idiosyncrasies.

In IPM improvisation, musicians interact in light of a sociocultural context. Going further, in a conjuncture where performers are explicitly more open to external stimuli (notably those emitted by their peers), the subjects themselves configure themselves as context, since subject "A" can manifest as a source of generation of innumerous circumstances for a subject "B". That is, depending on a series of variables, a musician can "adjust" his/her behavior according to the profile of the other instrumentalists with whom he/she plays. Thus, applying the concepts of Andrade (2011: 51), we can consider that the behavioral consequences of subject "A" may manifest as circumstantial antecedents for subject "B", and vice versa. Moreover, in MPI, "A" and "B" are

inserted in a socio-aesthetic-musical context that, inevitably, "indicates" behavioral lines for both subjects.

Habit still plays an important role in the development of the improviser. In Peirce (1962), one of the habit categories is an acquired specialization, a readiness for empirical behavior, constructed in the interaction between subjects, and between subject and environment. To the author, subjects internalize information that is more evident, or more latent from the formative environment, and thus acquire habits.

The manifestation of these habits in improvisation can also lead to a recurrence of regularities in the interaction between performers. Such a factor is important in characterizing the "style of interacting" of a group of musicians. Sarath (2013: 214) states that just as individuals are prone to conditioned patterns, groups are prone to conditioned ways of performing together. But despite the existence of behavior expectations, the reflective ability of the musician has the ability to modify the manifestation of a habit. To Peirce, habit, from one point of view, induces some regularity, but, at the same time, there is a need for breaking habit; it is what makes a creative process within a certain conjuncture. Upon detecting that a group of musicians creates habits, but continues to be creative, reveals itself as a regularity in the system that ends up inducing a set of habits. However, one of the habits of this system is precisely to question the possibility of habit. That is, there is an opening that is part of the conditioning of these artists.

Final considerations

The reflections undertaken in this text were in search of the broadest possible systemic model on the CIIPM. For such a resource to be useful in analyses of this object category, an interdisciplinary approach to the study is needed. An investigation based on essentially structural (purely technical-musical) analyzes does not contemplate the ontological meaning of the actions of the performers, since, in addition to actions in music, they can be intensely interpersonal. On the other hand, an approach that focuses only on the cultural aspects of the object is not capable of covering technical-musical information that, even from the perspective of the musicians themselves, is in the foreground of the field studied. We construct a model that can guide the analysis of real processes that go far beyond what the model conceives, due to the complexity of the cultural phenomenon. In our theoretical construction, we delineate the segment of an aspect of reality, which in turn is infinite in itself. Reality has no definite form and does not function as a system in practice, but the constructed model can illuminate this complex object, allowing the understanding of certain aspects.

For a successful analytical process of IPM improvisation, we believe that it is imperative to approach different faces of the object through different perspectives, both for the cultural aspects of music practice and its context of production, and for the technical-musical structure itself. Emergent properties result from the interaction between subjects, which in turn start from combinatorial ignitions, both of which can be described structurally/gesturally. We believe that such a path should be approached from the broadest scope possible regarding performance, listening and analysis possibilities. In this way, we believe that the model presented here can contribute to the field of studies dedicated to music improvisation, especially in the scope of popular instrumental music.

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