STOCKHAUSEN'S *STRUKTUR UND ERLEBNISZEIT*: CONCEPTUAL IMPLICATIONS IN CONTEMPORARY MUSIC ANALYSIS

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ABSTRACT

This paper discusses the idea of music as a "shaper" of time from the analysis of the organization of sound material and its structure in the first section of Alexandre Lunsqui's *Slope Field* (2014). Definitions presented by composer Karlheiz Stockhausen in his article *Struktur und Erlebniszeit* (1955) offers the theoretical basis. Furthermore, this paper defines some processes of alterations, repetitions and perception of time flow through a brief analysis of the arrangement of musical events, putting in evidence Stockhausen's ideas concerning experiential time. Along with these concepts, the research applies definitions from Schaeffer (1966) and Mesquita (2016) in order to evaluate Stockhausen's article consequences and relevance in contemporary repertoire analysis. Finally, the research demonstrates that implications of Stockhausen's concepts about perception of musical structures offers an open field to considerations of temporal experience in contemporary music and provides a useful tool for music theory and composition. This paper is a partial result of a master dissertation developed under guidance of Prof. PhD Marcos Mesquita in the research group Cogmus.

1. INTRODUCTION

1.1 Background to Stockhausen's *Struktur und Erlebniszeit*

With the surging of post-tonal music, the possibilities of organization and unfolding the sound material in time gained an importance not seen before, becoming a subject of interest by many composers. Especially around 1950, with the integral serialism technique, the temporal aspect gained a new impetus due to its dissolution of the other formative elements of musical sound [1], becoming autonomous and self-governing. Controversial, as seen in some critical writings from non-serialist composers, integral serialism changed the perception of temporality. Although American composer Elliott Carter argues that events in constant transformation may overload the limits of human perception and eventually lead to a crisis in musical communication [2], in many aspects this technique led to the development of different possibilities of temporal perception, superposing layers with independent temporal organizations.

In order to explain the phenomena of the diversity of temporalities proposed in serial compositions, composer Karlheinz Stockhausen has shed light on the theme by calling "experiential time" the temporality experienced from the structuring of musical events arranged in the chronometric duration of music. In his article *Struktur und Erlebniszeit* (1955) Stockhausen defines a "time experienced through sound" [3] by means of processes of alteration in sound structure and durational features. Through the analysis of the first section from the second movement of Webern's *String Quartet Op. 28*, Stockhausen illustrates his concept showing a variety of ways in which Webern build strategies to provide listeners to have their time perception molded by the musical events. Figure 1 illustrates a visual schemata proposed by Stockhausen, where dots represents *pizzicati* on the strings instruments and slurs represents the legato play, in order to highlight the organization of the musical events displaced through the modes of attack.

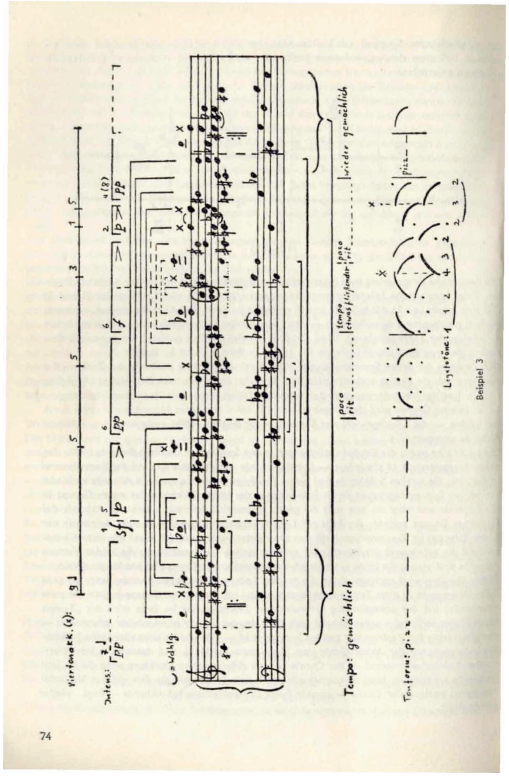

Figure 1. Stockhausen's schemata of analysis.

In this excerpt, Stockhausen argues that - although the quarter note remains consistent throughout the entire section – Anton Webern explores a distinctive temporal sensation based on perceptual data by applying changes in sound emission, modes of attack, increasing and decreasing simultaneities and intensities. Thus, even a single variation in one parameter is sufficient to articulate the temporal organization when others remains unchangeable. In this case, the bowed legato contrasted to the *pizzicati* represents the most dissimilar sound in this section. Due to the increasing density of *legato,* Stockhausen states that there is a sensation of urgency despite the unified rhythm.

Thus, Stockhausen asserts that the temporalities experienced in a musical work articulates the perception of time through differentiable phenomena, in which the distances between them link the passage of time [3]. Through these temporal interrelations, the compositional space can make the perception of temporality vary according to the level of transformation that the elements undergo. Therefore, the time of the experience is susceptible to the proper nuances of the dynamics of the sound processes of each music.

1.2 Some consequences of Stockhausen's article

As previously states, the multiplicity of experiences that music provides became a concern of a growing number of composers, giving rise to several works that deal with the subject with particular commitment. Corroborating Stockhausen's ideas, French composer Pierre Schaeffer says that the "musical duration is in direct function of the density of information" [4]. Thus, both Stockhausen and Schaeffer deals with ideas such as "information density" and "degree of change" of a given musical context as determining factors for listening to the temporal structure in the composition. In addition, his considerations come into consonance with the concept of music as a shaper of temporalities. Considerations by Boulez [5], Xenakis [6], Grisey [7], Ligeti [8] and Ferneyhough [9], for instance, deals with temporal perception and reflects compositional aesthetic concepts, influencing a generation of subsequent composers. Through this theoretical basis, one can assume that Stockhausen's proposal for analysis is competent to highlight temporal procedures in contemporary repertoire.

2. AIMS

This research aims to evaluate Stockhausen's concepts in a twenty-first century composition focusing in enlightening aspects of temporal flow and temporal motion from the musical structure though the sound material arrangement. For this, the research investigates the first section of Alexandre Lunsqui's *Slope Field* (2014), a composition written in a very continuo style, offering the appropriate material for the subject. Ultimately, this research analyzes structural devices such as repetitions, contrasts, densities of simultaneities, intensities, metric sense and temporal flow in order to relate them to Stockhausen's definitions.

3. METHODS

In order to discuss the idea of music as molding the time perception, this research assess Stockhausen's *Struktur und Erlebniszeit* in original German to assure the text integrity. To corroborate to the theoretical basis, in order to support concepts such as repetition, alteration, degree of information, degree of simultaneities, etc., the research also uses works and articles by Schaeffer [4] and Mesquita [1]. The analysis traces a correlation between Stockhausen's descriptions with its occurrences in Lunsqui's work. Thus, parameters such different degrees of repetitions, alterations, simultaneities and intensities presents in Slope Field relates to Stockhausen's ideas concerning time perception.

4. IMPLICATIONS

In accordance to the aims and the collected methods, the research resulted in an analysis attesting the applicability of Stockhausen's definitions. This analysis comprehended the first section of Lunsqui's Slope Field, work in which the composer made extensive use of repeated notes in order to create sonic "fields" with punctual and gradual changes. These repeated notes have an important structural function for the perception of the passage of time because "when we hear a piece of music, processes of alteration follow each other at varying speeds; we have now more time to grasp alteration, now less. Accordingly, anything that is immediately repeated, or that we can recollect, is grasped more rapidly than what alters" [3]. Thus, the repetition of a certain element tends to dilate the sensation of the passage of time. Still according to Stockhausen, the "experiential time is also dependent on the density of alteration: the more surprising events take place, the 'quicker' time passes; the more repetitions there are, the 'slower time passes' [3].

Gradually, the sound layers gains "deviations", with punctual alterations in the phraseological direction, giving rise to a certain internal disturbance to the homogeneous sound continuum. Figure 2 illustrates this occurrence:

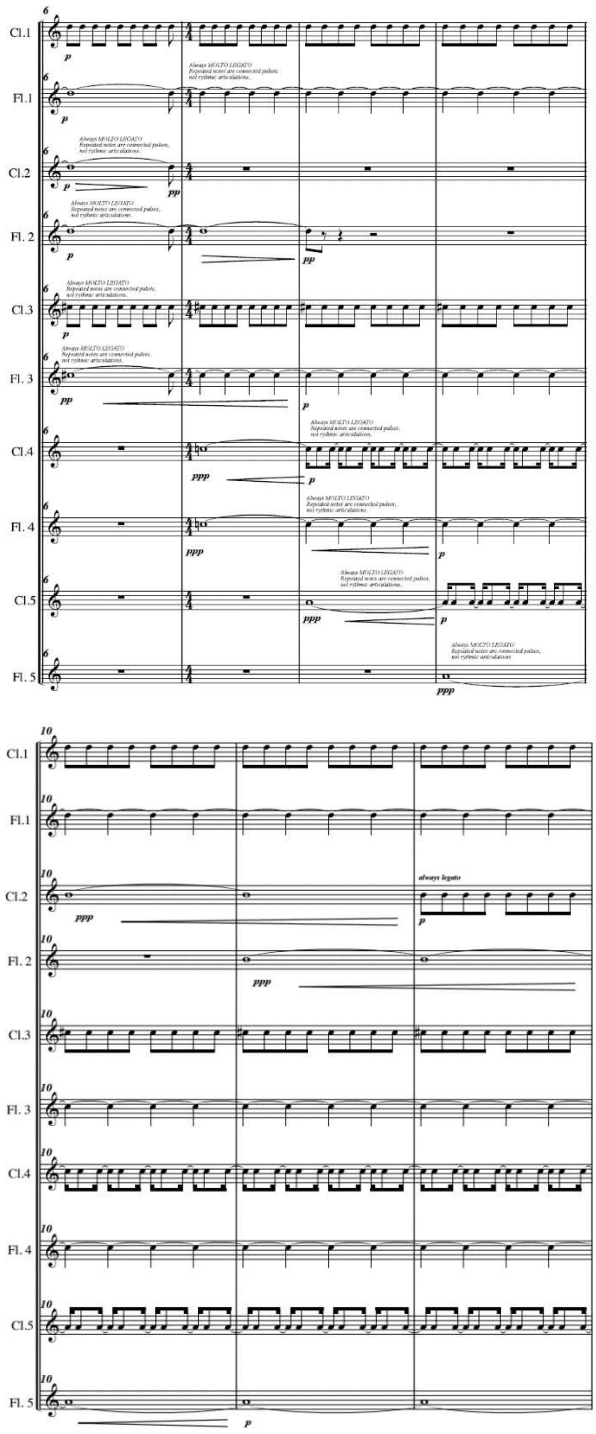

Figure 2. Lunsqui's Slope Field, mm.6-12, rhythmic deviations and D-C# pitch clash.

Furthermore, Lunsqui adds "dots" in this texture, acting like a "momentum of surprise" [3] within the established context. These points acts as elements of articulation of a hitherto essentially constant and regular musical discourse, taking on the auditory interest because it presents a degree of contrast greater than the previously established context. According to Stockhausen, "there is surprise only when something unexpected occurs: on the basis of previous events we expect a particular kind of succession of alterations, and then something occurs that is quite unlike what we expected" [3]. Thus, figure 3 shows these "unexpected surprises":

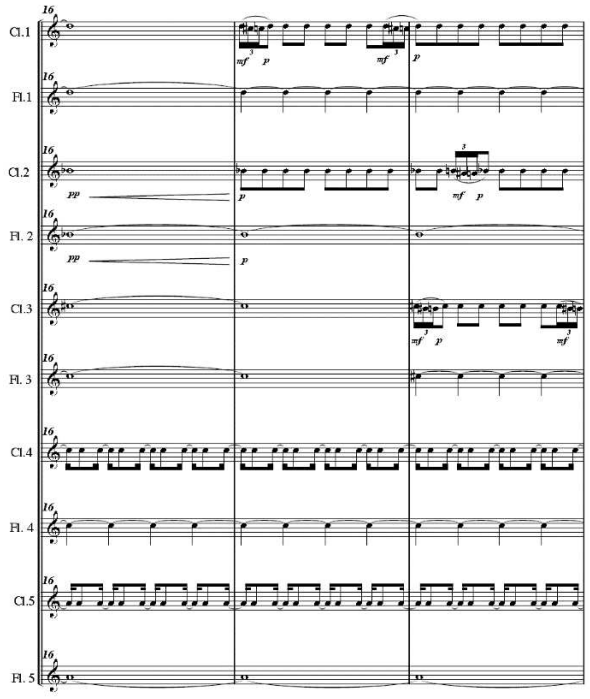

Figure 3. Lunsqui's Slope Field, reliefs contrasted to continuo texture.

At the end of the first section, there is an abrupt interruption in the continuo texture, marking the higher degree of alteration until thus point. This event clearly articulates the sense of musical flow, acting like a brief caesura and marking the beginning of a new section hereafter, as shown in figure 4:

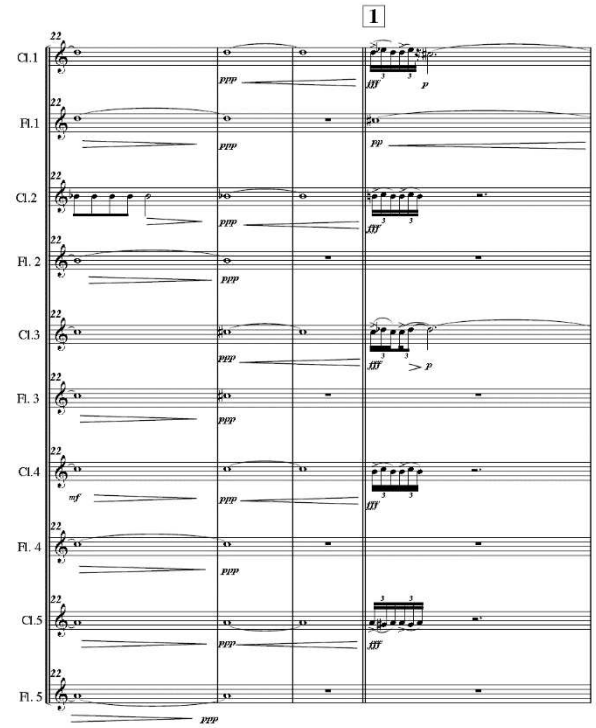

Figure 4. Continuo disrupted, marking the beginning of a new section, reorganizing the previous sound material.

Most of all, the dealing with expectancies, satisfying or frustrating them, pays an important role in this section in

order to achieve the perception of temporal flow. Stockhausen wisely says that "our expectations should be aroused through a logic of structural processes, one that can be experienced at the time, in advance and […] still more in retrospect (since what has preceded reveals itself only through what follows, a reversal of causality); once our expectations are aroused, we are in a condition to assimilate information, and are thus provided with aural 'rules': only then do the ensuing displacements and effective alterations surprise us and to the corresponding degree give us information" [3]. Thus, even a very continuo process molds the experience of time perception through some highly effective devices, such as different articulations, different degrees of simultaneities, contrasts in intensities and punctual "reliefs" in a plain established texture. Moreover, some Stockhausen's concepts resembles those from Gestalt grouping principles, such as proximity, similarity, symmetry, good continuation, and common fate [10], although the author did not mention it directly.

As a multi-parametric art, music offers various articulations of time-events, and the superposition of parameters with relative independence puts a listener perception in confusion to decide what to attend. Furthermore, especially in post-tonal music, the temporal aspect pays an important role in composition, motivating an analytical approach that consider both structural procedures and auditory perception.

Is important to note that, although Stockhausen applies his analytical concept in a brief excerpt contrasted only to its following section, one could presume that his theoretical ideas could relate to formal aspects, organizing the passage of time throughout the piece as a whole.

5. CONCLUSION

Due to its technical approach based directly on the structure of sound, Stockhausen proposed a series of categories concerning time disposal and its displacement relating to perceptual characteristics. According to the analysis realized, the research concludes that the definitions in Stockhausen's article proved to be a valid tool for analysis of technical procedures even in a repertoire with continuo characteristics of distribution of musical events, highlighting aspects of temporal perception related to structural devices. Thus, these procedures can contribute to theoretical and analytical field in twenty-one century repertoire and may assist compositional techniques of temporalities.

6. AKNOWLEDGEMENTS

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