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COMPARATIVE STUDY BETWEEN MUSIC AND LANGUAGE

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SUMMARY. The comparative study of music and language has become the object of many specialised researcher. As language, music involves perceptible elements organized in a hierarchy of sequential structures, based on syntactic principles. In order to define the concept of musical language and especially to understand why music is a language, we will start from the larger sphere of the definitions of natural languages.

We will see how the language elements and the mechanisms through which they become functional in communication can be extrapolated in music. The correspondence between natural language and musical language is biunivocal in general terms and flexible in particular situations. We will compare the two languages, in order to discover and express the places of interference and of dissociation between them.

Keywords: Chomsky, Schenker, language, music, structure.

Introduction

Although minds communicate through many sorts of symbols and gestures, only language and music - whatever their differences may be -operate on a large scale and in great detail. And while lesser forms of communication are found throughout the animal kingdom, only human beings are capable of producing and comprehending music and language. That these two discrete abilities should appear side by side strongly suggests they must be related. Since language seems by far the more useful of the two, it also seems a good bet that language may have developed first, with music branching from language only after much of the hard evolutionary work had been done.

This idea is made all the more appealing by the fact that a brain's language skills are focused in the left hemisphere, while the functions of parallel areas of the right brain have remained relatively mysterious. The right brain bears areas similar to the language structures of the left. Yet the right brain is mute. Some call it "the silent hemisphere".

Given the parallel appearance of language and music in humans, is it not reasonable to assume that the right brain speaks a musical language while the left brain speaks a verbal one?

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Another hint is that the inherent musicality of language is largely handled by the right brain. We hardly ever speak in a monotone. Instead we bring intonation to individual words and an overall prosody to sentences that make all speech a kind of song. Clearly the right brain has an affinity for the musical aspects of language.

To find out whether music derives from language, we need to cover a lot of ground. First, we will turn to the question of how language is structured and whether music resembles it. Then we will take a look at the distribution of language and music skills in the brain. This requires an appreciation of what it means for a cognitive skill to be "localized." For that we will digress a bit to see how neuroscientists obtain information about localization. Finally, we will consider what happens to language and to music when particular brain regions are damaged.

The association of music with language is an ancient one. When Saint Augustine wrote his *De Musica* in the fifth century, it was chiefly about poetry. Both music and language are about long, highly organized streams of sound. We learn to understand both music and language merely by exposure, and to generate sentences and melodies without any formal training in their underlying rules. Both seem to be "natural," built-in features of our nervous systems.

Phrasing may be the closest parallel between music and language. As we saw, phrasing divides long streams of sound into comprehensible chunks. Laboratory work confirms that our brain treats musical phrases and spoken phrases similarly; suspending comprehension as a phrase arrives, then pausing to gulp the whole thing down. One study showed that listeners have much more trouble finding a two-note sequence when it straddles two phrases; the mind simply does not want to hear the two notes together. Similar results come from a technique devised for linguistic research called *click migration*. Subjects are asked to recall the syllable at which a click was made in a sentence. Often, they will report a mid phrase click as occurring at phrase end, the point at which the brain firmly decides what the phrase has meant. It has been found that clicks similarly migrate to the ends of musical phrases.

The phrasing of musical instruments can sound a lot like the phrasing of speech. We are all familiar with occasions when instruments seem "to talk." But what constitutes a word in ordinary music? Is it an individual note? A grouping of notes? Speech sounds like "ch" and "ah" have no meaning until combined into words, and then their meaning is very stable. Metaphor aside, the word "giraffe" always refers to a long-necked quadruped, and never to a washing machine. But in music, a single D-flat can stand as an entire musical assertion in one context, yet in another it makes sense only as part of a musical figure. Unlike language, music seems to be meaningful at every level of analysis, and meaningful in the same way.

Because there are no musical words, there can be no musical parts of speech. We lack equivalents to nouns and verbs and adjectives in music, even by analogy. So as much as we would like to regard a melody as a kind of sentence, there can be nothing like a language's grammar in music. The grammars of natural languages are designed for exactitude. Particular kinds of words in particular forms and sentence positions generate precise meanings. Changing the form or order of words in a phrase is apt to render the phrase incomprehensible. But musical phrases are highly malleable and tolerant of ambiguity. A melody turned one way rather than another may be less pleasing, but it is still "meaningful." Indeed, unlike ordinary language, music thrives on the violation of rules. Linguistic validity is usually all-or-nothing; musical validity is more a matter of degree.

2. Natural language and musical language – Definitions and specific terms

Language is one of the specifically human means, the most frequently used in human communication. It has been defined as *„a vehicle that carries intentions, attitudes*."[1]

Musical language is a system of communication through musical sounds. In comparison with natural languages, musical language creates its own phonological system, meaning the sphere of the sounds that it uses (vocal and instrumental). The language infrastructure is composed by the phonologic systems. Each language is built on a phonologic system made up of a limited number of elements. These elements do not have value in themselves, only if they oppose each other. The phonologic systems are systems of relations of oppositions, organized in a certain hierarchy. The differences between elements have to be constant for the system to work[2].

Another element that is common with verbal language is the text. **The text** represents what is expressed in writing. The musical text represents, by extrapolating, what is expressed through musical notes. There is a term used in musical analysis, that represents a process comparable in its essential data with grammatical text analysis or literary criticism. **Morphology** is that *„part of grammatical structure made up from all the rules of changing the form of words in their uses; part of grammar that studies speech parts and their flexion."* [3]

Musical morphology studies the primary structural units of language (motif, sub-motif, and cell) and the way in which they interact and organize in hierarchies.

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[1] Jackendoff, R., *Foundations of Language*, Oxford University Press, New York, 2002.
[2] Teodorescu-Ciocănea, L., *Tratat de Forme şi Analize Muzicale (Treatise of Musical Forms and Analyses)*, Ed. Muzicală, Bucureşti, 2005.
[3] *DEX (Explanatory Dictionary of the Romanian Language),* Ed. Univers Enciclopedic, Bucureşti, 1998.

Syntax is that *„part of grammar that studies the functions of words and sentences in speech and establishes the rules of combining words in sentences and sentences in larger units; it is part of symbolical logic that expresses the derivation of logical expressions; poetic syntax represents the totality of stylistic techniques of literary language that belong to the topic of the sentence."*[4] Syntax can be defined as *„a set of principles that govern the combination of structural elements (such as sounds or words) in sequences."*[5]

Musical syntax represents the relations between sonorous objects, that is the ways of combining of syntactical units (phrases, periods) and morphologic units (motifs, sub-motifs, cells), and their functions in constructing the whole. Musical syntax is a syntax of equivalences[6]. The musical syntactic categories refer to types of relations between syntactic units on the vertical axis (simultaneity) and the horizontal one (contiguity), resulting in different types of musical structures: monody, poliphony, homophony, heterophony.

3. Structuralism in linguistics and music – Chomsky and Schenker

3.1. Nativistic theories of language and linguistic structuralism – Noam Chomsky

The study of language presupposes the investigation of problems such as: the perception of language, the understanding of discourse, the memorization of sentences and texts, the acquisition and production of language. Remarkable contributions to the study of language were made by the constructivist school (Wallon, Vigotski, Luria, Piaget) preoccupied by the investigation of language aquisition.

Nativistic theories of language concentrate on the role of innate biological equipments. The supporters of these theories state that we enter the world equipped for speech. Gray ennumerates the inborne capacities for speech: the anatomical structures in the throat, that make us able to produce a big range of sounds, in comparison with any other mammel; the preference for listening, speaking, for distinguishing all the basic sounds of speech; mechanisms that make possible the passing through certain phases and the specialized areas for speech in the brain (Broca and Vernicke).

The most representative supporter of nativistic theories of language is **Noam Chomsky**, who tries to explain linguistic surface structures described before by Saussure and Sapir. Saussure and Sapir said that basic linguistic

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[4] *DEX (Explanatory Dictionary of the Romanian Language)*, Ed. Univers Enciclopedic, Bucureşti, 1998.

[5] Jackendoff, R., *Foundations of Language*, Oxford Univ. Press, New York, 2002.

[6] Nicholas Ruwet - linguist, literary critic and musical analyst, author of the study *Language, musique, poésie,*1972.

units enter in specific relationships among themselves and with extralinguistic realities (signs, symbols). After this they integrate in much larger constructions[7] (syntagms, paradigms, grammatical products).

Chomsky had a double purpose: to find other non-apparent structures of speech (called deep structures by him) that are able to explain the surface structures, and to establish the rules that transform the deep structures in surface structures – transformational rules[8].

To make a parallel, I mention that musical discourse functions as well at many *structural levels* that interact with each other: the surface level of rhythmical-melodic events; the deep level of harmonic structure; the macro-structural level of the construction of form.

The surface level is the level of detail, of melodic and rhythmic configurations. This is formed according to the rules of construction of each stylistic orientation. The melodic structure of tonal or tonal-modal music is articulated by the musical morphologically-syntactic elements: motifs, phrases, and periods. The rhythmical-melodic configurations represent the *kinetic force* of the musical discourse.

The deep level of the harmonic structure boosts a musical piece by accumulations and removal of tensions and also determines the articulations of form. The harmonic cadences are the articulation points between structural levels of the musical form. The harmonic process represents the centrifugal force of the musical discourse.

The macro structural level is the result of interaction between the two levels described above, that inter-conditions each other and generates the whole image. In other words, form is defined through the relation between the ratio of surface events of the musical discourse – the events that are perceived immediately, as details – and the ratio of events in the harmonic level. Tonal music is characterized by the interference between the horizontal level of melodic unfolding and the vertical harmonic level.

Chomsky is the author of the theory of *universal grammar*. He proposes the hypothesis of „universal grammar', that he defines as *„the totality of those structures and innate biological mechanisms, characteristic to homo sapiens, that are able to explain, starting from the information given by the linguistic ambiance, the production of that competence described by the special grammars of different natural languages."*[9]

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[7] Saussure, F., *Writings in General Linguistics,* Oxford University Press, Oxford, 2006.
[8] Chomsky, N., *Syntactic Structures,* Mouton, 1978.
[9] Flonta, M., *Cognitio. O introducere critică în problema cunoaşterii* (*Cognitio.* A *Critical Introduction in the Problem of Knowledge*), Editura All, Bucureşti, 1994, pag. 115.

3.2. Structuralism in music – Heinrich Schenker

Chomsky's correspondent in the domain of musical analysis is **Heinrich Schenker**. This analogy between the two theoreticians was exposed in the book *A Generative Theory of Tonal Music* published in 1983, with Fred Lerdahl and Ray as authors. The two authors develop the idea launched by Leonard Bernstein in 1976, that there are analogies between the grammar of tonal music and Chomsky's generative grammar.

Schenker (1868-1935) is an Austrian theoretician passionate to develop an analytical method for valorizing to the maximum the composition material. The fact that he did not publish any pedagogical book did not hinder research on the part of students and not only, of his thick publications. *Introduction in Schenker's Analysis* serves as a basic study book in the field of musical discourse. Like the American linguist, Schenker differentiates between many structural levels, the deepest being *Ursatz*, that is the basic harmonic structure of any musical piece, and it is based on the tonic harmonic relation dominant – tonic[10]. Starting from this relation, Schenker developed several levels, such as: *foreground* (the closest level to the musical text, analogous to Chomsky's surface structure), *middleground* (intermediary between foreground and background, being made up of succesive reductions), that contains the most numerous phases and the closest level to the Ursatz, the *background*.

The proof of the usefulness of Schenker's analyses is their application by two great contemporary musicians: **Radu Lupu** and **Murray Perahia**. Interviewed by a reporter of Radio Romania Muzical about the importance of these analyses in the interpreting act, Perahia replies: „*I find them crucial (people accuse me of this and I don't understand why), because they work with basic elements of tonality that migrate from one point to another, with modulation and then turning to the initial moment. I think that this type of analysis has roots that belong to the nature of discourse and at the same time it makes sense, it makes you hear the sounds in their simplicity, as not all the details are important, but each is part of the developing process. I studied these analyses with great use and I have learned a great deal from this*." (Isacescu, 2010).

4. Syntax and morphology in linguistic and musical analyses

A literary text can be analysed in two aspects: syntactic and morphologic. There is a clear difference between morphology and syntax. A word with certain morphologic particularities enters in syntactic relations with other words to

[10] Schenker, H. – Oster, E., *Free Composition, New Musical Theories and Fantasies,* Pendragon Press, New York, 2001.

make a communication act. The morphologic particularities determine certain ways of combining of words, while certain combinations have morphologic consequences on the words that enter those particular relations.

The syntactic function has the role of including a word in the sentence, determining the function it has in that context, while morphologic analysis refers strictly to the word, focusing on its characteristics. In other words, syntactic analysis has a broad panorama, and morphologic analysis is narrower, isolating in a way the chosen word for analysis.

Also, in musical analysis there are two aspects to be noticed, syntactic and morphologic. *Musical morphology* studies primary structural units of language (motif, sub-motif, cell) and the way in which these interact and form hierarchies, while musical syntax represents the relations between sonorous objects, that is the ways of combining of syntactical units (phrases, periods) and morphological units (motifs, sub-motifs, cells), and their functions in the construction of the whole.

We will now analyze a literary text and a musical text, noticing the interaction between syntax and morphology in linguistics and music.

4.1. Morphosyntactic analysis of a sentence

Alexandra sang the prelude recommended by her friend.

Alexandra = subject, proper noun, feminine, nominative.

sang = predicate, verb, tranzitive, indicative, past tense simple, third person, singular

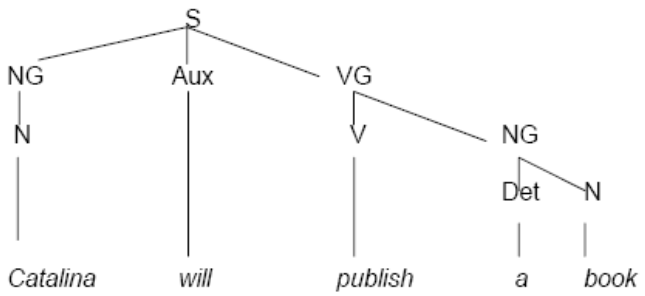
the prelude = direct object, common noun, neutre, singular, accusative, definite article „the”

recommended = attribute, verbal adjective, masculine, accusative

by...friend = object, common noun, singular, accusative, preposition „by”

her = attribute, pronominal adjective, third person, singular, feminine, genitive

Ex. 1



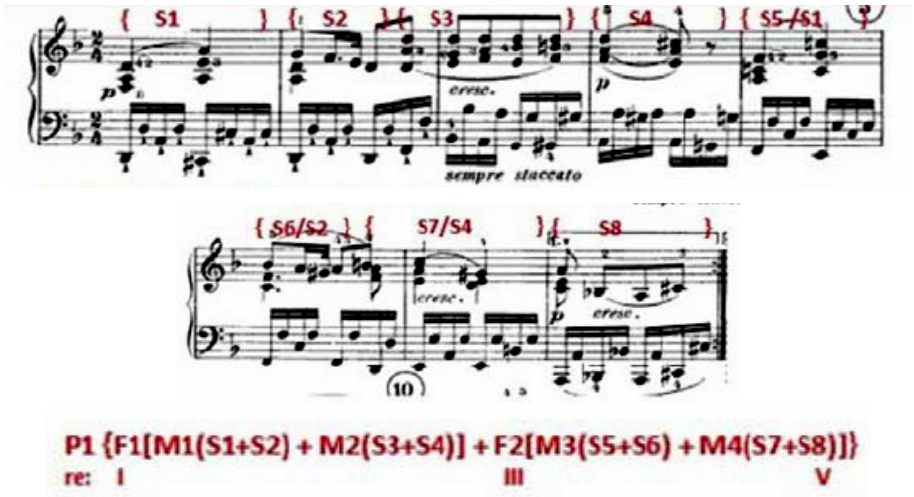
Syntactic representation of the „tree” type

4.2. Syntactic and morphologic analysis of the musical text

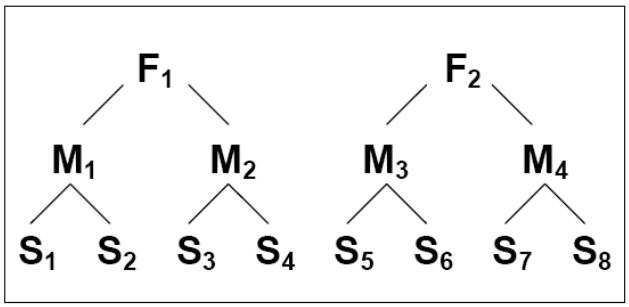
We will analyze the first musical period of the second part of the *Sonata op. 28* by L. van Beethoven. The Sonata is also called *„The Pastoral”*, because of its descriptive character, that evokes images from nature, so dear to the composer. It resembles, through the semantic meaning, the Pastoral Symphony, that has a strong programmatic character, and that generates the same light, joy, fascination for the wonders of nature.

The tonality of the sonata is D major, a tonality full of light and optimism. The Andante, written in the introverted D minor, creates a strong contrast with the other parts of the sonata. The predominant atmosphere is intensely meditative, withdrawn, with small spots of colour in section B, that brings the homonymous tonality, and that has a playful character, very different from the initial one.

Ex. 2



Ex. 3



But we will refer strictly to the first period of this part. It is made up of two symmetrical phrases (4+4 bars), with a regulated interior structure (2+2 bars). Both phrases are homogeneous, and the motifs share the characteristics. From the tonal point of view, the phrases are open, cadencing on the dominant of the initial tonality. The harmonic scheme is the following: I-III-V.

The writing is accordic, there are two levels that juxtapose: the level of accordic concatenation, that has an incorporated melodic plan, and the harmonic figuration exposed by the left hand, of the bass Alberti type. The left hand, constructed in the serious register, represents the kynetic force of the period, being composed of equal values and having staccato as a mode of attack. It seems implacable, cold, at first sight, but it accompanies the theme through the melody that is revealed through the latent polyphony. The superior level is constructed by a concatenation of accords that shape the melody of the theme through the superior notes.

We notice that, as a result of the melodic reductibility, the pillars are the constituent notes of the tonic arpeggio and of the IIIrd level. The two phrases are simple, square, with two motifs each. There are correspondences between motifs, resembling crossed rhyme, that is: motif number three corresponds to motif number one, and motif number four to number two.

Motif number one represents the *generative syntagm* of the period. It starts on the tonic, makes a loop of quint, and after this it comes back gradually to the tonic. The second sub-motif is stronger, because of the punctuated rhythmical formula. The third motif presents variations in comparison with the first, harmonically first of all, being on the III level, (Fa major), but also melodically, through sub-motif six, which does not descend towards the fundamental of the accord, but makes an embroidery towards its tertiary (the sound la).

Motifs two and four are anacrusic, breaking the symmetry of the phrase. Motif two is a rectotono on the tonic, like a recital, being repeated in equal values (quavers), and ended – at the end of sub-motif four – on the sensitive. The quaver break marks the end of the first phrase, making a respiration. The fourth motif resembles the second at the rhythmical level, but melodically they differ; it is practically a row of three solvings of the type: sensitive – tonic, in the following way: sensitive on the quint of the accord of level III, followed by the inferior and superior sensitives of the tierce of the accord (la), which is the dominant of the tonality as a harmonic function.

The second phrase is lighter than the first – at least in the first motif – because of the tonality of F major, the major relative of the basic tonality, coming back again to the sombre character of the first phrase (the second sub-motif, respectively sub-motif six).

The atmoshpere of this musical period is oppressive, suggesting a pointless, hopeless battle, combined with resignation. As a matter of fact, the sonata was composed when the composer's auditive sharpness was in continuous degradation, Beethoven fighting his own weakness.

4.3. Conclusions

About comparing the analytical methods belonging to Chomsky and Schenker, we state the fact that the two systems of analysis are not totally identical, Schenker's analyses being valid only for tonal music, not covering the atonal space in Schonberg's music or Berg's serialism. As the linguist Chomsky builds his theory that sustains the existence of a *universal grammar*, Schenker studies only tonal music, his system of analysis cannot be applied to the whole musical creation. The linguistic method of analysis, that can be applied to any musical work, consists in making hierarchies of the musical structures, that are harmonic, and rhythmical-melodic; that is, splitting the work in sections, periods, phrases, motifs and cells, following the comparison of all of these, and stating the relations they are in, and identifying the generative syntagm of the piece. Therefore, the two analytical systems complete each other, with the purpose of offering a complex image of the musical discourse, making an extremely necessary route for the professional and intellectual musician.

(Translated by Stela Drăgulin)

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