

## **IDEAS OF TIME IN MUSIC**

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IDEAS OF TIME IN MUSIC  
A Philosophico-logical Investigation  
Applied to Works of Alberto Ginastera (1916–1983)

ACADEMIC DISSERTATION

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## ABSTRACT

This thesis proposes temporal conceptions that stem from philosophical inquiry, such as linear time, cyclical time and branching time, to then find a connection with the way music is structured and with musical meaning. I consider ontological and phenomenological approaches to the problem of time and music in order to demonstrate this.

The central aim of this investigation is to build bridges and dissolve the opposition between time ‘taken’ (clock time) vs. time ‘evoked’ (conceptual time) in studies on time and music. Lewis Rowell, Jonathan Kramer, Jos Kunst and Alan Marsden’s contributions are going to be taken as the main references. I consider the ontological approach as extremely literal since linearity, circularity and branching time are not explored there as concepts defining the meaning of music, but as abstract orders in time for music being processed, viewed from an exclusively technical point of view. In turn, the phenomenological approach does not generally link music to philosophical developments, it just describes general cultural conceptions of time. This thesis interprets the temporal modes of the phenomenological approach as highly coincident with the temporal ontologies in the ontological approach, as seen through developments in temporal logic.

Temporal logic, a branch of the classical logic, is used as a methodological trigger. Here the work of Arthur Prior is going to be taken as reference. Temporal logic first formalises, then clarifies, and finally validates assertions expressing temporal beliefs. The hypothesis of this thesis, that temporal conceptions are expressed through music, having in this case the power to explain at least its primary meaning, uses temporal logic as a bridging symbolism. In this sense, a comparison between music and language within a broader analysis is undertaken, before developing ideas of logic and temporal logic within musical practice.

In particular, in my study of some works by the Argentinian composer Alberto Ginastera (1916–1983), I illustrate the idea of a multi-temporality, i.e. the same composer works with several time structures already available by a cumulative process in the history of ideas.

The thesis finds there is a special type of time in music—neither an exclusive ‘musical time’ as a totally separate time species; nor ‘Time’ in music, in an abstract de-subjectified view. Thus, a cooperative, synthetic position is defended. Secondly, music represents by means of its distinct elements something inherent to itself, which links with concepts of time (ideas), and by using these elements in certain conventional ways, displays culturally conditioned temporal meanings. Thirdly, music displays a kind of temporal logic, although an extended view comparing it with the exclusively linear logic of music as conceived by the formalist tradition in musicology. It is also an aesthetically oriented approach different from the temporal logic as applied in literal representations of music in computing areas. Finally, I argue for a new musical temporal mode, the actual branched time in music (in the sense of parallel times), through the addition of a theoretical background for this mode in musicological studies.

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This thesis was born from the confluence of many factors. In 2003 I was accepted as a postgraduate student at the University of Helsinki, Finland, where I began my doctoral studies. My sudden move to the North was motivated by two facts: firstly, the direction of the Department of Musicology, that encouraged working allowing discussions concerning philosophical issues jointly with traditional musicological studies. Secondly, I was interested in the activities of the Department of Philosophy, specially their tradition in Analytical Philosophy.

I studied Philosophy from 1996 to 2001 at the Universidad Nacional del Sur (UNS) of Bahía Blanca, Argentina. During that period, I was particularly interested in metaphysical issues, specifically the topics of space and time, and also in rational approaches to aesthetics. As a musician, and parallel to this academic education, I was a student of classical guitar at the Conservatory of Bahía Blanca.

A way of combining my apparent 'double life' was to write a doctoral work about music and time or how music can be analyzed as an organism logically designed in time.

I am profoundly grateful to all those who helped me to make this real, in one or another sense: affective, moral, intellectual, and economical.

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Finally, *kiitos paljon* to Finland as a country, its generosity and fresh atmosphere (indeed!). I learned from this country and people a very important chapter on strength, austerity, and prudence I will never forget. Thanks for the necessary silence of winters, and the brightness of summers I will ever in life remember as a miracle.

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Bahía Blanca–Helsinki, March 2013



*To Sergio*

Let each listener just open his ears and think of anything. If everything goes well, the music will then capture his thinking, and at least give form, even if not substance, to it. And it might very well be that producing frames of thought within which important ideas may take root, flourish and breed is, in the long run, even more effective than just putting forward important ideas. Maybe music is good for something, after all.

Jos Kunst

Each child spends endless days in curious ways; we call this *play*. A child stacks and packs all kinds of blocks and boxes, lines them up, and knocks them down. What is that all about? Clearly, the child is learning about space! But how on earth does one learn about time? Can one time fit inside another? Can two of them go side by side? In music, we find out!

Marvin Minsky

## PREFACE

As I was submerged in the practice of music and meanwhile studying time as a philosophical problem, some questions started to arise. I wondered if any relation could be demonstrated between the subjective and objective poles of time in the music I was interpreting. In this context, the score appeared as the objective data that I had to reproduce, but within my internal (subjective) experience of time. If the alchemy between one and the other (internal and external) time was wrong, the result of my musical interpretation as a whole was going to be poor. Moreover, to what degree did I have to bend this objective data to transform it into a correct interpretation of time in the music at hand? Why, for example, did I have to control this subjective way of experiencing time in music in works of the Classical period, while I had to free myself of an objective time whenever I chose to study music from another period from the history of the music, e.g. Romanticism?

The questions never ended. From very early age I was especially delighted by music from remote lands. I began to suspect that what I was hearing had a completely different structure from the usual forms and ways of narration compared to the music familiar to my culture. What happened with recurrence in Hindustani music? Did it share any common denominators with the harmonic statism of Gregorian chant, for example? How one could reproduce, using common, universal structures of time in music, so many practices in different cultural contexts and periods?

I became almost delirious with the prospect of musical gardens with endlessly forking paths. Open works and paths to be taken. I suddenly realized that the whole musical enterprise was this indeed: chosen paths. However something more concrete appeared inside this perspective: the possibility that many musical lines were functioning at the same time, diverse times proliferating and sounding together as a new coherent time structure for music. I discovered Charles Ives' *Three Places in New England* (1908–1914), Witold Lutoslawski's' String Quartet (1964), Elliot Carter's Third String Quartet (1973) and last but not least, a powerful work by Ginastera. I finally found my musical garden made true, not particularly in the improvisatory characteristic of his *Pampeana* N°1 but in a major work that portrays the reality of a Latin American time, his *Cantata para América Mágica* (1960).

In the following pages you will find an attempt to answer philosophically these and other connected, open questions of a young interpreter. This thesis is dedicated to musicians who wanted to make explicit some assumptions not always well formulated in their task of interpreting and of managing the time in music. Also, this work intends to shed light on composers devoted to understanding different structures of time in order to later explore its expressive capacity. Finally, this thesis is dedicated to philosophers in their search for the peculiar nature of the time of music and to all that would be interested in the topic, and who want to cross disciplines and become aware of some theoretical findings.

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## INTRODUCTION

The main goal of this thesis is to integrate the discussion on musical time to time in philosophy, to consider ontological and phenomenological approaches available in addition to their advantages and disadvantages, and to define a clear vocabulary for describing the various temporal structures in music in order to give an answer to questions about music signification and coherence.

‘Musical time’ as a topic deserving special research inside a philosophy of music and musicological studies in general, has been acknowledged only recently. Jonathan Kramer remarked on its absence from musical dictionaries in 1985,<sup>1</sup> reflecting the unclear status it has as a separate topic of study in relation to traditional theorising dedicated to the strict temporal values of rhythm, meter and *tempo* in music.

The relationship between music and time is manifold. Human beings express their inner temporal tensions metaphorically through music. On the other hand, music intrinsically involves time as an ontological condition for being perceived and finally, musical elements can be described as representing time conceptions forged in culture and philosophy. This situates the topic in a broader context of the interrelation of music and philosophical ideas, which is not to ignore the musical technical issues concerning rhythm and meter.

A number of problems related to the concept of temporality in music were already enumerated by musicologist Lewis Rowell:<sup>2</sup> “Is time atomistic or continuous?”, “How have metaphors for musical time captured some of its perceived properties?”,<sup>3</sup> “Why is it that we perceive time passing at different rates?”, “What is the ‘now’ in music?”, “What is the special role that memory plays in apprehending music?”, “Does the time of music have any relationship to cultural notions of time?”, “Can time be said to begin or to end?”,<sup>4</sup> “Is there such a thing as timelessness, infinity, eternity?”, “Does a musical work have but one time?”, “Can time bend?”, “How multidimensional is the musical

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<sup>1</sup> Kramer, Jonathan D., “Studies of Time and Music: A Bibliography”, *Music Theory Spectrum*, 1985, pp. 72–106. Today, ‘Musical time and temporality’ deserves a chapter apart in “Rhythm”, by London, Justin, *Grove Music Online*.

<sup>2</sup> Rowell, Lewis, *Thinking about Music - An Introduction to the Philosophy of Music*, 1983, pp. 29–31.

<sup>3</sup> Rowell amply treats this sub-topic in: “The Subconscious Language of Musical Time”, *Music Theory Spectrum*, 1979, pp. 96–106.

<sup>4</sup> Rowell dedicates a separate article to this aspect in: “What and How do Musical Openings Signify?”, in *Les Universaux en musique*, 1998, pp. 385–397.

mind?”, “Does the time of music have anything in common with the time of sport-‘agonic’ or contestual time?”

Rowell gives an overview of new temporalities in contemporary music already in 1983. He mentioned linear, multiple, static and moment time and finished by observing the importance of the study of musical time in future musicological research:

The changes observed in the temporal organization of music suggest not only new avenues for future exploration but also a possible framework of ideas with which we may interpret the recent past: just as the various stages in the evolution of tonality have provided a basis for identifying and interpreting long-range trends in the history of music, so may the evolving temporal structure of music provide a conceptual basis for assessing the succession and accelerating proliferation of styles since 1800. The stylistic course of music in the last two centuries may be described not only as the weakening and rejection of tonality as the main principle of organization, but also as the genesis and development of a new set of temporal modes, which may in time prove as influential a set of matrices for music as the modes, scales, and keys of traditional tonality.<sup>5</sup>

To contextualise the study of time in a determined corpus of music, Rowell has pointed out a comprehensive, multi-layered method of research. The issue of time in music deserves an inquiry into the history of time conceptions, the analysis of music itself, philosophies of music in its eventual relationship with philosophies of time, time in theories of music and time in the aesthetics of music.<sup>6</sup> All these levels combined would give an exact picture of the time of the music in question.

In this general overview, Rowell does not mention a question that could come before: that of the ontological status of time and hence, of the time of music. The problem of time in music indeed is subsumed under the same crucial question which is about the topic of time in general: Can the time of music be explained thoroughly just as an external process or is it also a phenomenon dependent on consciousness?

Since music cannot escape this matter, these two positions must be examined whenever arguing for an idea of musical time. Music, as granted by musicologists, is said to be the art of time,<sup>7</sup> however, there is no agreement among philosophers about the idea of a distinct ‘musical time’. This thesis considers an intermediate position with the benefits of both views: agreeing to a philosophical realistic conception of time in

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<sup>5</sup> Rowell, 1983, p. 248.

<sup>6</sup> This multiple perspective for the study of time in music is developed by Rowell, “El tiempo en las filosofías románticas de la música”, *Anuario Filosófico*, 1996, pp. 125–168.

<sup>7</sup> See as a first antecedent Hegel, George F. W., *Aesthetics, Lectures on Fine Arts*, in Katz-Dahlhaus, *Contemplating Music*, 1987, Vol. 1, pp. 337–358. In contemporary studies, Fraser, Julius Th., “The Art of the Audible ‘Now’,” in *Music Theory Spectrum*, 1985, pp. 181–184, and Kramer, Jonathan D., *The Time of Music. New meanings, New Temporalities, New listening Strategies*, 1988. Chapter 1 revisits the long tradition behind this current phrase.

general and recognising a clear description of it with the help of temporal logic, it will concentrate however on the specific temporal phenomena we find in music. So, in principle, the departure is both from the ‘ontological’ and ‘phenomenological’ points of view, comparing their respective explanatory advantages.

The ontological approach defends the idea of an abstract time in which music participates, notes the beginning-to-end direction of the arrow of time and calculates time objectively. Still, it offers different shapes of time which are crucial for describing the various temporal modes, although they prove meagre for musical analysis. The phenomenological approach conceives musical time as a species of its own separated from the rest of things in time. It believes music creates diverse modes of temporality (‘linear’, ‘non-linear’, ‘multiply-directed’, and ‘vertical’) which are beyond common time and concentrates on time as subjectively perceived. However, this musical time is inexorably related to ordinary time and time theories in general.

A coincident earlier thesis, which is presented as a kind of digression here, is found in Christian Norberg-Schulz in his philosophy of architecture, who proposes a similar methodological insight than the present here but about the idea of space.<sup>8</sup> He establishes an analogy between both the real—i.e. euclidean and einsteinian—and phenomenological—in terms of place, trajectory, and zones—interpretations of the spatial dimension, and an architecture exhibiting these ideas. He rewrites the history of the architectural forms in relation to the Egyptian idea of orthogonal space, through the extreme dematerialisation of the walls in the Gothic, and reaching the pluralism of contemporary architecture. Norberg-Schulz analyses the *templum* in Greek architecture, for example, neither simply as sculptural masses without interior space, nor just as a by-product of mathematical calculus. A more profound analogy reveals the analysis of the lived space behind, which is heterogeneous—here, ‘hybrid’. In this more comprehensive notion of space, different orders must be taken into account: geometric, sculptoric, orthogonal of the city in general, but also topologic and pluralist, in the sense of being fused to the natural scenery in which it is set and configured around the functions that wanted to serve.

This hybrid point of view presents advantages both for the musical case and for the architectural forms. Applied to music here, it advances an idea for the formalist tradition; in architecture, for the merely functionalist interpretations. In both areas the purpose is to provide much profound sense and signification to the forms, together with a practical or technical functioning.

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<sup>8</sup> Norberg-Schulz, Christian, *Arquitectura occidental. La arquitectura como historia de las formas significativas*, 1983.



The position developed here could be inscribed to a phenomenological realism. According to Edmund Husserl's (1859–1938) ideas on the objective experience and the scientific ideal of philosophy, objectivity, i.e., knowledge is explained as *cogito—cogitatum (qua cogitatum)*.<sup>9</sup> This signifies: consciousness is always given something as counterpart (intentionality), and this counterpart is given according to a parcel of knowledge, a perspective from which I can draw something. For the listener, time in music is this counterpart which at the same time is meant in its particular way according to his/her perspective. On the other hand, a realist account apart from its transcendental constitution in Husserlian terms is strongly considered by this thesis, since it brought a substantial apparatus of knowledge which cannot be disregarded.

The thesis proposes a study of time conceptions, searching mainly in philosophical approaches, but sliding into physical, anthropological and literary developments, in order to then explain their relationship with musical meaning. Temporal conceptions, as stemming mainly from philosophy, can be taken as paradigms when explaining different temporal structures in music, offering an answer to the question of music's primary level of signification. Aristotle, Kant, and Arthur Prior, among other philosophies of time are considered, having taken different time shapes as points of departure in their conception of time.

Musical time is here considered an *integral notion*, including all musical parameters that define, though not exclusively rhythm, meter and tempo; *ambivalent*, in that there is a distinction made between subjective timing and objective measurement; and working in a *layered* way, i.e. several modes of time can be working together in one work, although some are emphatically perceived and considered defining for a piece of music.

'Music' in this research is going to refer specifically to artistic and traditional music. 'Time' in this context can be objective or subjective and includes linear, cyclical, branching structures. Also the Hebrew, the Greek, the Hindu, the Andean, and the Latin American conceptions of time are going to be addressed as cultural perspectives.

Music 'represents' at the same time that it 'expresses' temporal ideas. Music *represents* 'quasi-events', as deduced from an ontological study of music, since the events in time with which music interacts are of a fictional nature. At the same time, music works with the purest events. In this context, the significations of music will not be explored, for example, by the emotions it arises but rather its representation of temporal situations and orders. Complimentary to this, the representation of temporal shapes will be studied from a pragmatic perspective, considering these ideas as

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<sup>9</sup> *Cartesian Meditations, An Introduction to Phenomenology*, 1999, 74 and 75, pp. 35–36.

*expressed* in a musical context. This thesis thus argues both for the ontological base of the internal temporal form and the different cultural conceptions of time expressed in music.

Temporal logic works as a methodological framework. The classical formulation made by Prior,<sup>10</sup> but also later critical sources will be considered. Temporal logic formalises, clarifies, and finally validates assertions expressing temporal beliefs as manifested through language via tenses and temporal adverbs. Beliefs concerning the *shape* of time specifically, which clarify analogue, temporal conceptions in philosophy, will have the main attention here.

The decision to adopt a *philosophico-logical approach* as declared in the title, has various levels of meaning, that is to say it illuminates four important criteria of the thesis, all equally displayed through the work. Firstly, it is related to the use of a *philosophical logic* as it is temporal logic, as the principal methodological tool. Philosophical logic is seen as a continuation of the traditional discipline of logic, before it was supplanted by modern mathematical logic. Philosophical logic continues to debate the connection between natural language and logic:

Philosophical logic is philosophy that is logic, and logic that is philosophy.

[...] logic supports philosophy, and philosophy feeds logic.

Philosophical logic develops formal systems and structures to be applied to the analysis of concepts and arguments that are central to philosophical inquiry. So, for example, such traditional philosophical concepts as necessity, knowledge, obligation, time and existence, not to mention reasoning itself, are usefully investigated through modal logic, epistemic logic, deontic logic, temporal logic, free logic, probability logic, nonmonotonic logic, etc.<sup>11</sup>

Although this thesis emphasises the philosophical aspect of this logic, it touches also its applied side. A delimitation between computing-technical and philosophical-theoretical approaches to music, time and logic are going to be thematised in Chapter 4.

Philosophical logic is easily seen as logic for philosophy. It is important, however, also to recognize that it has other applications in other disciplines as well. Today, much of the most flourishing research in philosophical logic is being done by computer scientists, working, for example, on aspects of knowledge representation, system verification, or AI.<sup>12</sup>

This thesis takes advantage of temporal logic as it can be fruitful for philosophical theorising, in this case related to questions in the area of the philosophy of music. This

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<sup>10</sup> Prior, Arthur N., *Past, Present and Future*, 1967.

<sup>11</sup> Goble, Lou, *The Blackwell Guide to Philosophical Logic*, 2001, p. 1.

<sup>12</sup> *Ibid.*, p. 2.

means that the final purpose is not in direct connection with representation and modelling, as for example is found in Marsden.<sup>13</sup>

A second meaning suggested by a philosophico-logical view is that this thesis uses both philosophical and logical tools, i.e. philosophies of time and temporal logic. They are the core material from which all arguments are developed.

Thirdly, philosophy and logic are used in the quest for a balanced discussion. In an imprecise way, philosophy is equated with phenomenological views and logic with ontological views when evaluating phenomenological vs. ontological views on musical time. As a consequence, a by-product can be obtained from the application of both approaches to musical time. While the ontological view provides us with technically neat language and concepts, the phenomenological views give us the opportunity to encounter the analyses of real musical examples, the matter of its perception, and the aesthetic dimension of the time of music.

A fourth reading of the subtitle, the most general and explanatory of the whole trajectory offered by the thesis is: Philosophical, as including the question of signification, and logical, that of rationality, in the sense that it deals with the question of coherence or unity in musical structure. The subtitle underlies then the two principal questions made by the thesis: Is time, ontologically speaking, a necessary condition or even a sufficient condition in terms of musical internal significance? Following this, in what sense are the structures established by music in time logical?

To sum up, all music is approachable via this above-mentioned perspective. Since music is interpreted as the art of time and no culture lacks a conception of time. Something to remark is the profuse previous research on this subject has not resulted in examination of the most important approaches to the topic in a single synthetic study, which is a goal for this thesis. Finally, the music of Alberto Ginastera, despite the attention it has received through musical and cultural analyses, it has not been yet subject to any philosophical analysis.

The thesis begins in Chapter 1 with a study of the background research. Previous research in this area will be divided into early, late and recent backgrounds. I will cover philosophies of time and music—Kant, Hegel, Schopenhauer, and Bergson as the most influential—followed by modern composers and aestheticians unified under musical Formalism, such as Eduard Hanslick, Igor Stravinsky, Gisèle Brelet, and Susanne Langer. Finally, I will deal with the most recent theoretical perspectives. I will divide this last group into phenomenological approaches—as in works by Jonathan Kramer

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<sup>13</sup> Marsden, Alan, *Representing Musical Time- A Temporal-Logic Approach*, 2000.

and Erik Christensen, musicological approaches with a historical perspective—Carl Dahlhaus, Lewis Rowell, Edward Lippman, Alfonso Padilla, and Karol Berger—, philosophies of music—Roman Ingarden and Roger Scruton—, musical semiotic approaches— Raymond Monelle, Eero Tarasti, and Thomas Reiner—, and as an exclusively logical approach, linked ultimately to computer analysis developments, Alan Marsden.

All these previous studies have been helpful for configuring a comprehensive and plural position about the topic that is inscribed within a kind of ‘phenomenological realism’; neither of them in particular could be mentioned as primary source or defining school. Those authors that have been studied in order to draw possible conclusions about the topics of the ontology of the musical work, musical language and musical logic are considered here as secondary sources. Their theses feed the ultimate goal of this study, which is focused on ideas about time and its relation to music signification and coherence.

Chapter 2 discusses the Ontology of Music. There, I display the analysis of the nature of time in music, the substance of musical time, i.e. a discussion on points—instants—, periods—intervals—or events—things that happen—as the alternative elements for ontology of musical time. I include a final selection for events as the main individuals configuring this time in the sense of harmonic, melodic, rhythmical, etc. events. I analyse Roger Scruton’s idea of pure events. The hypothesis on the primacy of time, supported through a new perspective of Roman Ingarden’s notions of quasi and supratemporality in musical works, is going to acquire relevance in contrast with Scruton’s development on spatiality as the central metaphor for musical understanding.

The chapter begins with related questions concerning the much more developed ontology of the musical work. A definition of musical work is given as an intentional object having—unless tacit—a creator or various creators, an eventual performer and a possible score, whose cultural creation is historically situated. A definition for music is offered as well, as an art which involves the play of sounds coherently arranged in time either for pure enjoyment or engaged with some human activity, whose meaning resides *primarily* although in many cases not sufficiently in the connection with certain pre-conceptions of time stemming from ordinary experience, and with philosophies of time.

Chapter 3 develops philosophies of language in relation to musical language. It searches into the kind of language music is. As a first step, it compares traditional theories of verbal language and theories of musical meaning. Then, it develops the syntactic vision for natural language and its idea of correction, i.e. of correct rules as defining what an understandable language is. This is correlative in musical studies to,

for example, the generative grammar of tonality providing rules of ‘preference’, since it is always possible to break the laws of music. Formalist approaches to music in general can also be included in this first division because they concentrate exclusively on the text or syntactic meaning.

A semantist vision of verbal language belongs to the logical tradition. At this stage in the comparison, the adjective ‘language’ applied to music is inappropriate for not recognising in music a sense of truth that corresponds with real facts/objects. Its parallel in musical studies is the search for external meanings through referentialist theories of musical signification—i.e. imitative and expressive theories as well as the recent theory of *topoi*. Intentional views for language emphasising the author’s inward expression also can have its place at this point in the chapter, since they constitute univoque ideas of signification in music.

The pragmatist conception of language, as thought by Wittgenstein, finally allows a more comprehensive idea of musical meaning. It deals with concepts such as ‘outwardly demonstrable capacities’, being able to ‘follow the game’ of a music, and ‘matters of use’. There are no fixed meanings in music but instead they are mutable according to contexts of use—i.e. minor mode for funeral music does not work as a universal. Wittgenstein’s expressive conception of language ultimately is extracted specifically from his examples on music.

The final purpose of this chapter is to justify a semiotic study of the temporal signification of music. The syntactist’s approach to musical temporality concerns the study of time within musical syntagma; semantist approaches relate music with general abstract ideas of time; pragmatist positions bring down temporal conceptions to particular interpretations within a period or the work of a composer.

Chapter 4, on Music and Logic, explores the connection between logic and music. The argument for a temporal logic in music demands a careful interdisciplinary analysis. The chapter refutes a first consideration of music from the point of view of formal logic born from language in a strict sense, for it is only a metaphorical approach—music is unable to meet the condition of consistency. For example, what is negation in music? Although some analogies could be found, the comparison seems not to be reliable.

A second matter I consider is the study of logic applied to music in connection with practical uses like computer analysis. This thesis’ goal as a whole, far from studying the technicalities of making music available to a computer for its processing, tends to develop a fruitful comparison between a strict application of logic to music and the idea of ‘musical logic’ as current in musicology.

The traditional idea of a ‘musical logic’ was forged from the perspective of temporal linearity associated with tonal music, as it is found in Dahlhaus.<sup>14</sup> The thesis reinterprets this idea by adding circular and branching perspectives inspired by the philosophical temporal logic. This extension of the concept of musical logic finds new senses of coherence in the structure of artistic and traditional music.

Chapter 5 introduces musical analyses. The case studies chosen could have been varied and of a widespread nature—in principle, all music could be interpreted according to the ideas mentioned above. However, this research will focus briefly into the repertory of Alberto Ginastera (1916–1983).

The temporalities his music displays are not only those ultimately related to European philosophies of time, due to the particular mixture proper of Latin American culture. Instead, to understand temporal meanings in Ginastera’s work I will explore Native American views, as for example the peculiar ideas about cyclical time and permanence in Andean cosmology. Parallel times, which appear frequently in Latin American literature—Borges, Cortázar, and Carpentier—are also going to be tested. The purpose is to amplify existing studies on time in music, in connection with these cultural notions of time.

Temporal modes will be classified as linear, cyclical, and branching. Linear time defined as music that unfolds as some parts of the work anticipate what will happen later on, creating a sense of consequence. The idea of circular time applies to music mostly based on repetition same and similar patterns. Branching time can have two meanings. It can be ‘potential’ when it is interpreted in comparison to the world of practice, in which we have alternative events and only one must be chosen. Branching time’s ‘actual’ meaning is represented by parallel worlds and it involves several, often non-synchronized, layers of time working simultaneously in a single work. Furthermore, these general shapes in reality reveal complex interactions and cases of superposition of temporalities or mixtures are common. The cumulative process of incorporating time experiences by contemporaries is mirrored in the work of this composer, which exhibits the three shapes analysed.

To illustrate these temporal modes I have chosen three works by Alberto Ginastera. For linear time, *Sonata para piano op. 22 No. 1/I*, 1952; for cyclical time, *Norteña* from *Tres piezas para piano op. 6*, 1940; and for branching time, *Cantata para América Mágica op. 27*, 1960, particularly movements I and VI.

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<sup>14</sup> Dahlhaus, Carl, *La idea de la música absoluta*, 1999, pp. 103–115.

The approaches combined in this work are considered traditionally rival, competing perspectives that do not cross each other. The purpose is however to present a comprehensive, panoramic, actual review of the topic, bridging time studies in philosophy with those in music, joining them in a critical overview. Finally, the thesis provides elements for aesthetics of time in music, it combines efficiently with pedagogically oriented purposes in the field of composition,<sup>15</sup> and it promotes non-standard readings on music. Aspects of this eclectic view that can appear vulnerable are its strength. Its hybrid nature shows a picture open to major philosophical questions and further musical research.

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<sup>15</sup> Junchaya, Rafael, "Musical form after the avant-garde revolution: A new approach to composition teaching", 2010.

# 1. Time and Music. The Problem and the Approaches

## 1.1. Historical Background and Antecedents

Western philosophers through the ages have been developing their conceptions of time and meanwhile writing about music. Both topics found answers in the works of Plato, Aristotle, Augustine, Kant, Hegel, Schopenhauer and Bergson, among others.<sup>16</sup> The interrelation of ideas of time and the practice of music is far from being a topic of circumscribed, historical research. The task here is to pinpoint the moment at which ideas about time and about time in music were explicitly showed to interact, defining a particular moment of reflection inside the aesthetics of music, and the themes that carried the study of musical time up to this date.

The possible connection between ideas of time and ideas of music developed by Western philosophers<sup>17</sup> is not always explicit. Plato's idea of time in *Timaeus* as an "image of eternity"<sup>18</sup> together with his opinions on music as mathematical harmony<sup>19</sup> in the same dialogue, for example, do not offer a clear association between them. Moreover, the extent to which ideas of time would serve to interpret the time of the actual music that was listened to—not just 'theoretical music'—, seems less clear. Even more difficult seems to be the application of Aristotle's idea of time in *Physics* as "measure of movement",<sup>20</sup> to his ideas on music in *Politics* as a "liberal and noble"<sup>21</sup> discipline. Later, Augustine's (354–430 A.C.) exposition on internal time in *Confessions*<sup>22</sup> and his definition of music in *De Musica* as "scientia bene modulandi"<sup>23</sup> (implying theoretical music) seem again deprived of any explicit relationship.

All the previous philosophers, however, situate music as a kind of mirror of the 'soul' harmony. The soul can be corrupted by corrupt harmonies and rhythms—*ethos*

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<sup>16</sup> In Calleja, Marianela, *Tiempo y música: un problema lógico-filosófico*, 1995–2001, Aristotle, Augustine, Kant and Heidegger's philosophies of time were explored to sketch the principles of a theory of the time of music in general.

<sup>17</sup> A general introduction to these topics found in Fubini, Enrico, *La estética musical desde la Antigüedad hasta el siglo XX*, 1990, pp. 55–97.

<sup>18</sup> *Timaeus*, 37e.

<sup>19</sup> *Ibid.*, 47e.

<sup>20</sup> *Physics*, III, 11, 219b.

<sup>21</sup> *Politics*, VIII, 3, 1338a.

<sup>22</sup> *Confessions*, XI, 27.

<sup>23</sup> *De Musica*, I.



theory. However, the association of the movement of the soul with movement in music, especially as found in Plato, *Republic*,<sup>24</sup> prepared the field for what was to come.

The German tradition appears as one of the most prominently developed in this brief history of music and of ideas about time. Immanuel Kant's (1724–1804) philosophy of time implies a change of paradigm, between the prefiguration of his *Inaugural Dissertation* (1770) and his *Critique of Pure Reason* (1781). Kant's innovation consisted of explaining time as the way in which humans perceived the world (an *a priori* form of our inner sensibility).<sup>25</sup> The philosopher however did not associate his idea of time with his exposition in the *Critique of the Power of Judgment* (1790) where he describes music as a “beauty play of the sensations of hearing”.<sup>26</sup> He was ready to change his position from an objective time either seen till this moment as a product of innatism (Descartes) or as the result of empirical change (Hume)—to a subjective time, which is how human beings experience the world.<sup>27</sup> He speaks about series, order, content, and extension of time—the time that allows humans to have coherent experiences. Kant, however, did not ever remotely connect his idea on time as a condition of sensible experience—i.e. here, of music—to the problem of musical time as a subcase embodying it.<sup>28</sup>

On the other hand, Kant is considered a precursor of musical formalism and the asemanticity of music.<sup>29</sup> The connection of his time and music ideas was made by the critique that followed, which situated his philosophy at the beginning of a discussion about time as a primary signification for music, obviating any other referential content. At that point, ‘musical time’ as a special topic in musical aesthetics and as the expressive mirror of human time itself was no longer hidden from the mind of philosophers.

A first thematisation of musical time is found in G. W. F. Hegel (1770–1831). Hegel conceived of time as situated in the ‘mind’—in opposition to the Newtonian idea of an absolute, external time—, but as a collective mind, as a dialectic change of oppositions

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<sup>24</sup> *Republic*, III, 399a.

<sup>25</sup> *Critique of Pure Reason*, I, 1<sup>st</sup> Part, 2nd sec. § 5, 6, 7 and 8.

<sup>26</sup> *Critique of the Power of Judgment*, § 51 and § 53.

<sup>27</sup> Note Saint Augustine's treatment of time is already negating time as an exclusively external, cosmological experience.

See Rowell, 1996. This article constitutes the only one development focused on philosophies of time and music.

<sup>28</sup> For an interpretation of Kant's theory of time illuminating aspects of Schenkerian analysis, see Fessel, Pablo, “La concepción kantiana del tiempo y la anterioridad de lo tonal en la teoría de Heinrich Schenker”, *Música e Investigación*, 2000, pp. 127–134.

<sup>29</sup> For critical comments see Fubini, 1990, pp. 216–217 and 326.

in a never ending process.<sup>30</sup> Time and history unfold in a dynamic way. Rowell<sup>31</sup> suggested that Hegel was the first to associate time in general and musical temporality, by noting the spiritual aspect of music, despite situating it still under poetry in his classification of arts<sup>32</sup> in *Aesthetics: Lectures on Fine Arts* (1820):

Now, since time, and not space as such, provides the essential element in which sound gains existence in respect of its musical value, and since the time of the sound is that of the subject too, sound on this principle penetrates the self, grips it in its simplest being, and by means of the temporal movement and its rhythm sets the self in motion [...]<sup>33</sup>

The relevance of the internal time of performance is another important idea of Hegel. The reproduction of music makes it necessarily a performing art but more importantly it carries over the internal temporal movement of the subject.

For music takes as its subject-matter the subjective inner life itself, with the aim of presenting itself, not as an external shape or as an objectively existing work, but as that inner life; consequently its expression must be the direct communication of a living individual who has put into it the entirety of his own inner life.<sup>34</sup>

In turn Arthur Schopenhauer (1788–1860), contrary to Hegel, noted the absolute supremacy of music over other arts. Music is reserved a supreme place in the framework of his ideas in *The World as Will and Representation* (1818). He conceived of general time there also as an “eternal and basic law of the world or a chapter of cerebral physiology”.<sup>35</sup> In contrast with Hegel also, he did not give any primacy to time as the latter had given primacy to the time of music. Time for Schopenhauer was part of the phenomenal world; music, as mirror of the Will could not be associated with it, but was to be considered apart from time. The Will has internal contradictions, as music has dissonance/consonance, which is equal to how Will alternates between effort and satisfaction.

Now the constant discord and reconciliation of its two elements which occurs here is, metaphysically considered, the copy of the origination of new desires, and then of their satisfaction. Precisely in this way, the music penetrates our hearts by flattery, so that it always holds out to us the complete satisfaction of our desires.<sup>36</sup>

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<sup>30</sup> Hegel, *The Philosophy of Nature*, 1817, sec. 1, part A, § 258.

<sup>31</sup> Rowell, 1996, p. 133.

<sup>32</sup> ‘Symbolic’ for architecture, ‘classic’ for sculpture and ‘romantic’ for painting, music and poetry.

<sup>33</sup> See Katz-Dahlhaus, 1987, p. 356.

<sup>34</sup> *Ibid.*, p. 357.

<sup>35</sup> Schopenhauer, Arthur, *The World as Will and Representation*, Vol. 2, pp. 48–51.

<sup>36</sup> *Ibid.*, Vol. 2, p. 455.

From the point of view of a search into musical signification, Schopenhauer thought that music did not reproduce particular feelings of love or anger but the pure essences of those feelings: “Music does not express this or that particular joy, but anxiety, pain, horror, jubilation, happiness, contentment in themselves, to a certain extent in the abstract, unaccompanied by any incidentals and thus by any self-interest.”<sup>37</sup>

As a consequence of this thinking, philosophers who coincide with the first musical Romanticism (approximately 1780–1850), like Friederich Schelling (1775–1854) and Søren Kierkegaard (1813–1855), wrote about musical time in terms of ‘musical rhythm’ as an abstract, pure category, which situated music at the highest levels of the spiritual arts. From a semiotic point of view, these speculative approaches to music would offer an idea of musical signification that is transcendent.<sup>38</sup> Any signification of music that could be obtained from these views is situated metaphysically, idealistically out of this world and cannot be put into words, i.e. it is ineffable. At this point, this thesis is at the philosophical antipodes, developing a realistic way of interpreting time in music. This thesis is interested in the way we *actually* organise time and why we preferred certain ways of doing so, without engaging in a discussion about whether one goes beyond real life time or not at the moment of listening or if time ‘stops’ at these moments. Realistic visions on time try to understand how ideas about it have influenced music inside the practice, but it does not enter into how music makes us experiencing something transcendent as a result.

Richard Wagner (1813–1883) added an important view to the current conceptions of time and music in philosophy that must be remembered. He intuited aesthetic concepts of his time but recreated them under the prism of a composer. Thus, much of his concerns were practical, technical, but remarkable for later understandings of musical time.

Time in music has become a social construct, open to anthropological investigation. The musical rhythmical element he attributed partly to the inheritance of folkloric dance as it is expressed by the distinctive character of the various musical ethnical and national traditions —not an abstract rhythm, but “our” and “their” rhythms. Rhythm has become a social science.<sup>39</sup>

These concerns are going to be addressed in this thesis also, for they would imply, although here still in a seminal way—i.e. circumscribed to the temporal parameters, the concrete interpretations of general time conceptions, as reflected by a music tradition or by a certain author in a certain moment.

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<sup>37</sup> See Katz-Dahlhaus, 1987, p. 153.

<sup>38</sup> *Ibid.*, p. 9.

<sup>39</sup> Rowell, 1996, p. 157. Author’s translation.

Henri Bergson (1859–1941) is a major figure to remember when speaking about time and music.<sup>40</sup> Against the mechanics and physics of that moment, he defended the idea of a life that fought for something of a more elevated spiritual order. The ‘vital impetus’ is the source that wants to transcend the material world. He had such an impact on musical aesthetics precisely because he used musical examples of ‘passage’, as central for explaining his ideas on time as ‘pure duration’ in opposition to the measured, spatialised time of physics. The impact of his philosophy to later aestheticians who were pioneers on the topic of musical time has been enormous.

Musical formalism of the 20th century emphasised form, internal structure, and a negation of personal expression, expanding the idea of time-*as*-becoming in music. In his *Poetics* (1952), Igor Stravinsky (1882–1971) noted the importance of the temporal dimension in music. He was inspired by Pierre Souvtchinsky’s essay “La notion de temps et la musique” that appeared in *Revue Musicale* in 1939, which in turn was inspired by Hegel. According to the composer, music is a certain organization of time. Music could be constituted by a temporal arc in which the poles of attraction exist.

Gisèle Brelet (1915–1973), French aesthetician, continued the reflection initiated by Stravinsky, receiving inspiration from French spiritualism, Bergson, and Lavelle. Brelet wrote *Aesthetics and Musical Creation* in 1947. The concept of musical time was central to her aesthetics in *Le temps musical* (1949). She followed formalism in her ideas on art as related with pure forms, distinct from the psychological personalities of their creators. She pointed out that temporal form was at the essence of music and had a deep relation with the temporality of consciousness. Duration is pure form for Brelet, different from Bergson who had thought of amorphous becoming. Again, music is the expression of the lived duration of the consciousness, as for Hegel.

According to Brelet, dynamism characterises time in music, i.e. the idea of time-*as*-becoming against that of time-*as*-being. In *Aesthetics and Musical Creation* (1947), she divided *form* (classical) and *structure*, this latter being proper of avant-garde music. Structure for Brelet reflected the sense of becoming and pure duration in music.<sup>41</sup>

The works of philosopher Susanne Langer (1895–1985) constitute an important step for the topic of musical time. In *Philosophy in a New Key* (1942), she developed the idea that music is different from language. Music is, however, a symbolic but not immediate imitative expression of emotions.<sup>42</sup> Langer was a disciple of Whitehead and reflected his influence in her comparison of the ways of signifying in language with

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<sup>40</sup> Ibid., pp. 141–145.

<sup>41</sup> See Gutiérrez de la Concepción, Nieves, Gutiérrez de la Concepción, María Luisa, “Gisele Brelet y el tiempo musical”, *Sinfonía Virtual*, 2006.

<sup>42</sup> Langer, Susanne, *Philosophy in a New Key*, 1942, p. 218.

those in music. Whitehead believed that the signification process was carried out by the constituents of experience—both symbol and signification were elements of experience. In language, i.e., constituents are the audible phonetic word and the content meaning appointed. This idea, positivist in essence, was applied to music by Langer. Music has meaning although it cannot be expressed by words; still, both symbol and meaning are accessible. Music has signification, it is the logical expression of emotions. The ineffability of music, however, appears in her system of thoughts. Again, her idealist and transcendent signification for music are also distant from the approach followed here.

In *Feeling and Form* (1953) however, Langer writes one of the most significant phrases for this topic: “Music makes time audible, and its form and continuity sensible [...]. It creates an image of time measured by the motion of forms that seem to give it substance, yet a substance that consists entirely of sound, so it is transitoriness itself.”<sup>43</sup>

It was Langer who firstly noticed that music made time effable in the sense of reproducing virtually its characteristic sense of transience translating this idea of virtuality to the whole of her philosophical work. Langer describes the passing of time through physical, emotional, or intellectual changes. She dedicated the analysis to the problem of the analogy between music and internal life. Music consists of the creation of a virtual time, as opposed to clock time; it is the appearance of the organic movement of our temporal essence. Langer finished by giving an intuitionist conclusion, saying that every work of art is intuited and that it does not communicate anything, contrary to the positivist plan presented in *Philosophy in a New Key*. Her thoughts will deserve special treatment along this thesis.

In addition to the studies of philosophers and aestheticians from different traditions, the 20th century brought a couple of them carried out by musicologists and composers. As we go from aestheticians to musicologists the topic becomes more and more circumscribed. While the former pay more attention to the problem of signification in music, the latter deal with the description of, for example, the various modes of musical temporality. At this last stage, the topic reached a status of its own in current musicological studies.

At first, they explored phenomenological and dynamic approaches. One of the few references to musical time as a separate topic, available in musical dictionaries, is

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<sup>43</sup> Langer, Susanne, *Feeling and Form*, 1953, p. 110.

entirely dedicated to this particular approach.<sup>44</sup> According to the article among the most significant contributions is the work by Kramer, with its grounds in Fraser's<sup>45</sup> theory.

Specifically, to arrive at the main topic of this thesis, developments in the area of phenomenology and time as a general philosophical topic and later, ideas on phenomenology and musical time, constitute a subtopic to be considered here.

According to Beaudreau,<sup>46</sup> Husserl's phenomenological method is present in many studies of musical time, either on the surface or hidden. Divergent tendencies can be found inside the phenomenological approach to musical time. In the case of Kramer he applies the phenomenological method to 'large-scale' invariant features or modes of temporality.

In general, phenomenological research is opposed to axiomatic-constructive theory. It is defined as an 'opening' position. Its aim is to demonstrate how theories condition what we see or hear, but without proposing a new theory. Phenomenology can succinctly be described as the following particular method: 1) Phenomenologists investigate phenomena presented directly by experience. 2) They interpret objective and subjective data as equally real and relevant. 3) They think that cognition is signed by intentionality: 'noema' (intellective act) and 'noesis' (object or content) are present for configuring the act of cognition. Indeed, the term 'intentionality' means that every objective phenomenon that appears in immediate perception will be perceived in a certain way according to the subject's intentions. 4) They prefer description to explanation. 5) For phenomenologists any previous belief and theory must be questioned, and there is an avoidance of what they call 'sediments'. 6) They must be systematic in applying the successive 'reductions'. 7) The result of their investigations must present structural invariant features, which are explained through the application of the phenomenological reduction and variational method.<sup>47</sup>

Phenomenology applied to the topic of musical time emphasises the idea that the passing of time is perceived by changes and asserts that these changes, instead of referring to the outside world, refer to the psychological level. Bergson had already noticed that the temporal was explained by a psychological awareness of changes or fluctuations inside a subject. The psychological present, in turn, allows us to understand the apparent coherence perceived by successive, isolated events in time. William James'

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<sup>44</sup> London, *Grove Music Online*.

<sup>45</sup> Fraser, Julius T., "Reflections upon an evolving mirror," *Kronoscope*, Journal for the Study of Time, 2004.

<sup>46</sup> Beaudreau, Pierre, *Recent contributions to the phenomenology of musical time*, 1989.

<sup>47</sup> *Ibid.*, pp. 35–36.

concept of the ‘specious present’<sup>48</sup> explains how an individual note—onset, continuation and conclusion—and a series of following notes are integrated under a ‘now’.

Thomas Clifton thought of the musical present as a nested organisation of temporal ‘horizons’, including expectations—‘protentions’—and awareness of past events by memory—‘retentions’. According to him, protentions and retentions are responsible for the construction of our musical experience and knowledge. This thesis also studies distinctions between instants, moments, and events as the individuals of time, from the ontological approach to time in philosophy. However, the concern of ontological approaches is at the level of an external, objective time.

Jonathan Kramer’s (1942–2004) investigation represents a chapter of phenomenological studies in relation to the topic of musical time. However, he uses the terms ‘vertical time’, or time-as-being, which proliferates in new music, signalling the abandonment of an exclusively dynamic approach to time in music. In this context, an intermediate position is found in ‘moment forms’.

Thus, if in a normal piece each event forms part of a larger tissue of protentions and retentions, building up a complex horizon that encircles the time-world of the piece, in moment form each section or element occurs within a self-contained horizon, a boundary that is impermeable to events that precede or follow [...] While there may be a sense of passage within (but not between) moments, in the most extreme cases even this sense of passage is lost.<sup>49</sup>

Clifton reflected on pieces whose organisation is exclusively teleological. Pieces structured in circular time—including Kramer’s studies on moment and vertical time—and branching time, as are both studied in this thesis, were not a primary concern for the former author.

Kramer defines linearity and non-linearity as central to his study. He considers that for three centuries western music has emphasised linearity, although non-linearity is present in all works. Linearity implies development and should not be confused with continuous time; continuity and discontinuity can be applied either to linear or non-linear time. From linearity/non-linearity Kramer develops the following categories: directed linear time, non-directed linear time, multiple directed linear time, vertical time, and moment time.

In his thesis, Beaudreu presents Kramer’s study as a subcase departing from a phenomenological approach, in the following sense:

(It) is interesting from a phenomenological point of view because it demonstrates the inextricable connection between the noetic and noematic poles of experience (intentionality) in creating the

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<sup>48</sup> London, *Grove Music Online*.

<sup>49</sup> Id.

perception of any particular type of time. The perception of goal directed motion in tonal music (linear time), for example, is not something we receive ready-made from the music itself. Rather, as listeners, we bring a mode of temporal processing to what we hear that enables us to perceive time in a certain way.<sup>50</sup>

[...]

What is of interest to phenomenologists in Kramer's work is that he implicitly adheres to the phenomenological idea of intentionality in describing temporal experience. Kramer does not claim that the various types of musical time are given to our consciousness "ready-made," but maintains that our experience of the temporal in music is largely the result of the interaction between our musical and cultural expectations and the sounding music. This interaction suggests that environmentally conditioning factors such as cultural attitudes and musical training are a necessary component of the way we perceive time in music.<sup>51</sup>

The idea of changing the usual modes of perception—for example, applying modes of perception of moment or vertical time to a linear time piece—could also function as part of Beaudreau's interpretation of Kramer's as a phenomenological work. Kramer himself described this situation as an occasion for leading to new 'noematic' possibilities for well-known music.

At this point we can contrast phenomenological studies with those coming from the side of the psychology of music. From a phenomenologist point of view, psychology has avoided holistic, real experiences of music in favour of isolated, laboratory experiences. It has developed simplistic answers to amply discussed and complex questions concerning the musical case as an artistic totality. In his chapter on Psychology, Kramer hopes phenomenology and psychology will work together towards a more precise picture of the topic at hand.<sup>52</sup>

Big questions put psychological and phenomenological approaches face to face:

How can we reconcile analysis based on measurement of absolute time with experienced musical time that is influenced by the continually changing contexts of most compositions? How can we reconcile the idea of meter as a clock [...] with the idea that perceived duration depends on information context?<sup>53</sup>

The psychology of music has its role in studies of time perception embracing questions of the sort:

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<sup>50</sup> Beaudreau, 1989, pp. 156–157.

<sup>51</sup> *Ibid.*, pp. 148–149.

<sup>52</sup> Kramer, 1988, pp. 322–324.

<sup>53</sup> *Id.*



In what ways [...] do we perceive, encode, remember, and retrieve information about duration and proportion? And, is music somehow special, or is information about timespans in music processed in the same manner as all durational information?<sup>54</sup>

Although some psychologists demonstrated that subjective time does not equal clock time, experimental psychology linked to music puts an emphasis on clock time.

The new cognitive approach to psychology however began studying the topic of time perception with a broader view. Moreover, their subject matter seems to reflect that of musical theorists. Cognitive psychologists search for “[t]he potential correspondence between the syntactic structures of music, which are organised to communicate musical meanings, and the cognitive structures in the listening mind, which extract and understand those meanings.”<sup>55</sup>

At the moment of publication of his book on musical time, Kramer’s opinion was that

Despite their *rapprochement*, psychology and theory remain distinct. A crucial difference is that music analysts postulate an ideal listener, who hears all levels and numerous complex relationships simultaneously, while psychologists are interested in the capacities of real listeners.<sup>56</sup>

This thesis, although recognising the important aspects on psychology linked to the perception of temporal parameters and production of musical temporal modes described, will not deal with this type of questions. The primary interest for this thesis is philosophical, i.e. the idea that there are connections between what Rowell called an ‘ideological field’<sup>57</sup> on time and how these temporal ideologies connect with time in music as an aesthetic quest. This does not exclude the possibility of searching for the psychological principles of producing and perceiving the temporal modes studied here, but only as a second stage.

Finally, in his *Introduction to the Philosophy of Music*,<sup>58</sup> Rowell states that temporality must be accounted for in a value judgement about music. The temporal values he enumerates are:

- Motor rhythm: obtained by repetition and recurring accent.
- Rate: fast/slow, tempo. The temporal scale of a musical work consists of a number of interlocking rates of pulsation, of accents, of patterns, and so on. Tempo is not an

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<sup>54</sup> Ibid., p. 326.

<sup>55</sup> Ibid., p. 327.

<sup>56</sup> Ibid., p. 328.

<sup>57</sup> Rowell, 1996, p. 166.

<sup>58</sup> Rowell, 1983, pp. 167–173.

absolute judgement but a ratio between some arbitrarily selected rate in the music (beat) and our notion of fast, moderate, slow, and all the shadings along. Tempo can be steady or *rubato*.

- Hierarchy: several levels of subdivisions, beat divisions, beats, measures, phrases, and phrase-groupings.

- Logogenic/melogenic ('word-born'/'melody-born'): The time of speech is more uneven, more constant in tempo, and flatter in hierarchy; whereas the time of music is more regular, has a variety of *tempi*, and has a steeper hierarchy.

- Free/strict: Western tradition considers precise timing as normative and temporal freedom as a pleasantly expressive deviation. Passage from free to strict musical time has developed into an important formal archetype in music, in the form of a slow, loosely organized piece followed by a faster, more strictly organized piece ('becoming' followed by 'being').

- Motion/stasis: sonorous bodies vibrate, but the motion we perceive in music is a more complex concept. The simplest example of motion is locomotion, and this refers primarily to a spatial dimension. Musical motion however is a kind of vehicular motion that may be intermittent, at a steady or a variable rate. That is why we interpret the motion of music as either motion or stasis. We tend to interpret any departure from the traditional teleology of music as stasis.

- Conflict and deviation: we experience the interference of the normative temporal patterns of our music as pleasant. It is customary to fix a time scale and then to deviate from it. Music may embody the conflict in extreme in recent compositions that have explored the possibilities of non-synchronized music or multiple time lines.

This last point brought by Rowell, 'Conflict and deviation', is an antecedent to what will be interpreted as 'branching actual time music' in this thesis. In sum, these remarks comprehend pedagogically the points that should be detailed and included in any temporal analysis of a musical work.

The topic of musical time had taken such a place in research that very soon the question of whether musical time as a special time species existed or not became a theme among philosophers. The debate involved phenomenologists and ontologists. The relatively recent ontological and logical approach to music and time of Alan Marsden, presents itself as an alternative to be contrasted with the previous phenomenological research reviewed above. Traditional questions on the ontology of time in philosophy—like the individuals, shape, extension, and texture of time—are applied to time in music,

being a precise goal, with the help of the formal neat language as temporal logic. According to Marsden,<sup>59</sup> the decision for a certain approach within temporal logic defines whether the analysis of temporality is going to be displayed for describing in-time processes—while listening—or out-of-time processes—once the process has ended, when one has the spatial organisation of it. In his out-of-time approach he searches for the best ways to decide among several modelling of temporal information to be implemented later in software designs. One result of his work is the preference for the use of linearity, for a practical, economic processing reason. The idea that works begin and finish tracing a line is one of the characteristics of the ontological approach to time in music.

Historically, temporal logic has its roots in the origin of logic itself, with Aristotle. In fact, it was Aristotle who first that recognised that time modified the true value of statements, in his discussion on the application of the law of the excluded middle in the context of contingent futures. The proposition “There will be a sea-battle tomorrow”, in *On Interpretation* 9,<sup>60</sup> is neither true, nor false, but possible. These thoughts strongly influenced Prior to develop his temporal logic: “That things might change to being true or false, from not being definitely either, is certainly a more radical view than that they might change from being true to being false and vice versa [...]”.<sup>61</sup> This situation implied passing from a determinist conception of time to one allowing possibility and free will.

Another antecedent for temporal logic was Diodorus Cronus.<sup>62</sup> The historical antecedent for the extension of a modal logic<sup>63</sup> to a temporal one is in Diodorus’ translation of the modalities into temporal terms. Thus, he defined ‘possibility’ as ‘what is and will be true’, ‘necessity’ as ‘what is being always true and will be never false’, ‘impossibility’ as ‘what is being always false and will never be true’, and ‘contingency’ as ‘what always is and will be false’. All these definitions have been extracted from his famous ‘Master’ argument.<sup>64</sup> The stoics continued the path inaugurated by Diodorus,

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<sup>59</sup> Marsden, 2000, p. 17.

<sup>60</sup> Aristotle, *On Interpretation*, Ch. 9: Of propositions referring to the future, as opposed to propositions referring to the present or to the past.

<sup>61</sup> Prior, 1967, p. 16.

<sup>62</sup> C. 300 B.C., he thought (contrary to Aristotle) that possibility did not exist, all that exist is real (actual). Thus, he introduced determinism. Ferrater Mora, *Diccionario de Filosofía*, ‘Diodoro Cronos’.

<sup>63</sup> Modal logic signifies the logic of modes, which means, the modes in what a statement can be true or false. A true statement can be *necessary* or *contingent* (‘S is P’ or ‘S is P or S is not P’), and a false one, *possible* or *impossible* (for example ‘Socrates died due to drinking strychnine’ and ‘2+2=5’). As a result, ‘possible’, ‘necessary’, ‘impossible’ and ‘contingent’ are ‘modalities’; they are distributed as quantification in the ‘Aristotle square’ and modal logic is the branch of logic that works with them. Orayen, Raúl, “Lógica Modal”, in Alchourrón, Carlos (ed.), *Lógica*, 1995, p. 290.

<sup>64</sup> There he defended the argument that from two mutually exclusive events, if one becomes real, the other is impossible, or from the possible we would be deriving the impossible.

which defined modalities with reference to present or future instants. This implied considering tenses as part of the proposition to be judged for its truth-value, a way developed by a branch of the modern temporal logic, i.e. *tense logic*.

Megarians, on the other hand, defined modalities with reference to undetermined instants in time. In fact, ‘possibility’ was defined by them as ‘what is happening in some time’ (‘It is possible  $p$  iff  $\exists t [Tt (p)]$ ’) and ‘necessity’ as ‘what is happening in all time’ (‘It is necessary  $p$  iff  $\forall t [Tt (p)]$ ’). These kind of statements are defined from ‘ $p$  in the date  $t$ ’, using a circumstantial complement of time. This implies expressing properties on earlier-later instants conceived as ‘eternal’, as seen from the ‘outside’, a way developed in a second branch of temporal logic, i.e. *chronological logic*.<sup>65</sup>

Therefore, there are two big families inside temporal logic: the so-called tense or grammatical time logic and the date or chronological logic. These two paths had their historical origins in the temporal translation of the modalities either in the diodoran-stoic or megarian styles. However, the first modern axiomatizations of temporal logic have been made by Arthur Norman Prior (1914–1969), the pioneer who developed tense logic in his *Past, Present, and Future* (1967). Nicholas Rescher (b. 1928) and Alasdair Urquhart (b. 1945) should also be mentioned, since they presented the first comprehensive introduction to temporal logic as a case of topological logic and developed chronological logic in *Temporal Logic* (1971). Rescher concludes:

Central to all of these variant constructions of temporal modality is thus a conception of statements that will vary in truth-status over time, pointing towards a corresponding body of logical machinery to deal with the relations among such time-related propositions.<sup>66</sup>

According to Prior, the above mentioned split of temporal logic has contemporary roots in the famous controversy born in John Mc Taggart’s (1866–1925) proof,<sup>67</sup> which, by the way, demonstrated the unreality of time. Later, the abridged argument is presented jointly with Prior’s refutation.

Mc Taggart distinguished between what he called the ‘A-series’ (past–present–future) and the ‘B-series’ (before–after). He noticed that the second series was the only permanent, whereas the first one was based on it. If an event (i) is earlier than an event (ii), then it is always earlier; but a present event *was* future and *will be* past, so it implies change. Mc Taggart argues that the judgement around the truth or falsity of a proposition in time (A–series) is later than the fact that an event is either always false or always true (B–series).

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<sup>65</sup> Gardies, Jean-Louis, *Lógica del tiempo*, 1979, pp. 43–46.

<sup>66</sup> Rescher-Urquhart, *Temporal Logic*, 1971, p. 11.

<sup>67</sup> *Mind*, “The Unreality of Time”, 1908, pp. 457–74.

To demonstrate his idea, Mc Taggart develops an argument in three steps showing that the A-series, and time itself, involves a contradiction. 1) Pastness, presentness, and futurity are mutually exclusive, and yet every event has them all. 2) It could be objected that an event never is past, present and future at the same time; rather: *is* present, *will be* past, and *has been* future. To this objection Mc Taggart answers that all these statements are based on a non-temporal ‘being Y at’, in that for instance ‘X *has been* Y’ means asserting X *to be* Y *at* a moment of past time—the same happens with the other two instances of time, present and future. 3) Finally, the moments of future time, are equally of past time and present time, and in this situation resides the contradiction; thus, time is unreal.

Prior concentrated his critique on Mc Taggart’s fundamental assumption of a non-temporal *is*. Propositions dealing with the A-series, whose truth-value changes, cannot be non-temporal. Secondly, the assumption that past, present, and future are mutually exclusive and yet every event has them all, is wrong, since being past of something, once it has started, is a permanent state rather than a momentary one.<sup>68</sup>

Prior’s goal was to refute and debunk metaphysical event-based philosophies of his time, especially those of Charlie Broad (1887–1971) and George Moore (1873–1958).<sup>69</sup> Those philosophies affirmed that there were events that changed, and paradoxically they could not exist on their own but just as infinite orders over things carrying them. Their solution was “things change, events happen”<sup>70</sup>. For Prior it was more radical. He had learnt from John Findlay (1903–1987), who at the same time had learnt from Wittgenstein, that time as well as events had been mystified if taken as such. Prior’s calculus of tenses would yield something else. The real point is not that events are only momentarily, but that they do not exist at all. ‘Is present’, ‘is past’, etc., are only quasi-predicates, and events only quasi-subjects.<sup>71</sup> This way of thinking puts also to rest the spectre of an infinity of time-series over things one within the other. “Nothing is left of that except cases in which one propositional prefix governs another, as in ‘It will be the case next year that it was the case 53 years ago that I am being born’”.<sup>72</sup> Thus, Prior conceived that the formation-rules of the calculus of tenses were not only a “prelude to deduction” but also “a stop to metaphysical superstition”.

Contemporary developments that followed Prior concern either philosophical issues—namely, the determinism versus indeterminism debate, the use of branching

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<sup>68</sup> Prior, 1967, p. 6.

<sup>69</sup> Ibid., pp. 7 and 18.

<sup>70</sup> Ibid., p. 10.

<sup>71</sup> Ibid., p. 18.

<sup>72</sup> Prior’s solution was thus inscribed in the linguistic turn of XX analytic philosophy. Ibid., pp. 18–19.

time in counterfactual reasoning, the logic of duration—or application of temporal logic to other fields, especially computer science—i.e. artificial intelligence, planning systems. It is also important to mention the use of temporal logic in quantum physics. Regarding the connection between temporal logic and computers, its founder, Prior, had already observed:

The usefulness of systems of this sort [on discrete time] does not depend on any serious metaphysical assumption that time *is* discrete; they are applicable in limited fields of discourse in which we are concerned only with what happens next in a sequence of discrete states, e.g. in the working of a digital computer.<sup>73</sup>

The principal motivations for developing the logic of time in connection with this musical inquiry are either those of philosophical or linguistic nature.<sup>74</sup> By philosophical motivations we mean the aim of showing the difference between tensed and tenseless expressions. ‘The tonic chord is sometime going to be’, in symbols ‘ $Fp = p$  in the future (Ex. 1) and ‘In measure  $x$ , the dominant chord is earlier than the tonic chord in measure  $y$ ’, in symbols ‘ $Rxy = x$  is earlier than  $y$  (Ex. 2) are different temporal expressions. The first is an indefinite statement, working with pseudo-dates, also seen as an ‘in-time’ expression. The second is a definite statement, containing a genuine date or historical moment—in the case of music, pointing to an exact position in the score—an ‘out-of-time’ expression. ‘In’ and ‘out’ are correspondent to different ways of considering these expressions, either from an observer inside time, living his/her passage, or a position that does not need an observer and conceives time positions as absolute and independent of human mind, from the ‘outside’. These different expressions are again reflecting the temporalist and the atemporalist positions about the existence and non-existence of time, respectively.

A second philosophical motor for the logic of time is the aim of formalising metaphysical ideas on time. These ideas basically deal with decisions about substance—whether points, periods, or events are their main instances—and structure—linear, circular, and branching shapes—of time; they also include the question of time extension and texture. All this, however, does not imply that the logic of time decides about the nature and structure of time in reality, something that would concern to physics, but simply that it works with the formalisation and assertion of our expressions involving hidden positions concerning different conceptions of time. These expressions

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<sup>73</sup> *Ibid.*, p. 67.

<sup>74</sup> Other important motivations such as exegetical, mathematical or computational are well introduced in Burgess, John P., “Basic Tense Logic,” Gabbay D. and Guenther F. (eds.), *Handbook of Philosophical Logic*, 2002, p. 2. More recent work applying temporal logic in the fields of computer science and linguistics pointed out by Vázquez Campos, María E., “Lógicas temporales”, in Alchourrón (ed.), 1995, pp. 215–216.

basically are articulated either by tenses or dates in our natural language, as shown by Examples 1 and 2 above.

Linguistic motivations for the application and development of temporal logic concern the problem by which tense has been omitted from traditional theories of meaning. Tensed expressions have been considered to add an important weight at the same time as expressing human behavior,<sup>75</sup> while traditional logic has been blind to this for a long period until the recovery of time in logic by Arthur Prior and others.<sup>76</sup> Coincidentally, time issues have been absent during a long first stage of theoretical studies of music. The question of time in music, i.e. important aspects such as motion, stasis, continuity, progression, pacing, proportion, duration, and tempo, were omitted in favor of ‘stationary’ pitch, rhythm and meter theories.<sup>77</sup> This search for a temporal understanding would have its parallel in natural language. In both realms, language and music, it is a quest for more expressive representations: in language, of truth that changes with time; in music, of its compositional arrangement in time.

In this text, those motivations are deepened to develop a philosophy of time in music. Thus, two ways of dealing with temporal logic, specifically in connection with the representation of musical time—the tensed vs. the tenseless versions—and the analogy established between linguistic expressions and musical expressions as containing both metaphysical assumptions about time, are explored.

Some main works are quoted and contrasted here. Alan Marsden’s B-approach and Jos Kunst’s A-approach<sup>78</sup> to temporal logic in relation with musical time representation are introduced. These works are invaluable for this thesis, since they are the only source of existing attempts to combine music and this philosophical logic. These authors, however, direct their attention to goals different from the present. The first author applies temporal logic to the assessment of musical time representations and its usefulness in connection with computation. The second author uses temporal-modal logic for formalising the listening process of music.

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<sup>75</sup> Note the difference between these expressions: ‘Fortunately, the consultation with the dentist is over’ (uttered at 1 p.m. on a given date) and ‘Fortunately, the consultation with the dentist is before 1 p.m. (on that date)’. The first statement cannot be reduced without losing meaning; when it express the fortune of having ended a consultation previous to the time expected, the second statement says that fortunately t1 is before t2 (!). Øhrstrøm, Peter and Hasle, Per F. V., *Temporal Logic. From Ancient Ideas to Artificial Intelligence*, 1995, p. 245.

<sup>76</sup> Kuhn S. T. and Portner P., “Tense and Time,” Gabbay D. and Guentner F. (eds.), *Handbook of Philosophical Logic*, 2002. Also Øhrstrøm - Hasle, 1995, pp. 118–231.

<sup>77</sup> Kramer, 1985, the first complete bibliography of time studies in music.

<sup>78</sup> Kunst, *Making Sense in Music: an Enquiry into the Formal Pragmatics of Art*, 1978.

Composers work with time structures hidden in their works, as music cannot escape from the situation of being in time and expressing certain temporal ideas. One important result of this investigation is that it is in principle music itself which determines certain temporal conception, independent of a composer or community who consciously or unconsciously have a determined—individual or social—idea of time. This last hypothesis, that there is in fact a connection between musical and social times, is not thoroughly verified by empirical musicology, as shown by recent cognitive enquiries.<sup>79</sup> In this sense, the use of temporal logic as a method for testing musical temporal expressions, such as the analogy with linguistic ones, could constitute a step towards achieving a better tool for connecting individual-social time with music time in future investigations.

Andrew McGraw's analysis of cognition and perception of temporality in music is treated as a counterpart to Rowell and Kramer's studies as he updated the topic of musical time in empirical musicology. Following the traces of all these previous works, this thesis develops a view by which the formalisation of musical time is collected from score analyses, principally as a method of recognising temporalities in music itself and interpreting its possible connection with individual–social time. In this sense, analyses of scores, its division per musical parameter, decides the temporal predominant mode.

Our temporal beliefs are manifested through language. Temporal logic first translates—i.e. formalises—, then clarifies, and finally validates assertions expressing those beliefs. It is a hypothesis of this thesis that temporal beliefs are also critical in the decision about the structure of a musical work and, eventually, linked to its final perception. It is important then to detect the link between these beliefs and their effects in the musical work—temporal logic bridging the connection. Øhrstrøm realised the importance of temporal logic in the context of time studies:

A satisfactory understanding of time requires a careful study of temporal relations in human society. It must be admitted that this sociotemporality is very complex and that little has been done in order to reach a deeper understanding of it. But it is clear that language and communication are in general essential for an understanding of social time.

[...]

If such studies [of the different strands of science] are lead to a deeper understanding of time itself, various disciplines have to be brought together in the hope that their findings may form a new synthesis, even though we should not expect any ultimate answer regarding the question of the

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<sup>79</sup> McGraw, Andrew C., "The Perception and Cognition of Time in Balinese Music", *Empirical Musicology Review*, 2008. Also the critical review by Cross Ian, *et al.*, "Commentary on 'The Perception and Cognition of Time in Balinese Music' by Andrew Clay McGraw", *Empirical Musicology Review*, 2008.



nature of time! If a synthesis is to succeed, a common language for the discussion of time has to be established. We are convinced that temporal logic (or ‘the logic of time’) is a crucial part of such a language.<sup>80</sup>

Here a further step is taken: this study on language and time is relevant for understanding socio-temporal beliefs in musical works. The straightforward connection of temporal perception, beliefs, verbal communication and musical communication is the path followed by this thesis. The power of the method here developed has to be judged against its analogical nature, and analogical methods vary in the way they convince.

McGraw, in his test for identifying time-in-general/time-in-music associations in Bali, failed to find any sustainable connection coming from the data. However, McGraw measured the latency of responses first between time in general and music concepts (‘Task 1’), and then between time in general and dance concepts (‘Task 2’) and compared their respective response times. As a consequence, he based his Test of Implicit Association for time in music/time in general “on rapid cognition of words, not of music”<sup>81</sup> —a scientific or empirical version of which Rowell had tried in his ‘Subconscious Language...’,<sup>82</sup> aiming to prove the opposite result. The first big problem of this method is that music is non-verbal, so the test, although promising, remains unsatisfactory.

The strength of McGraw’s enterprise however resides in his cognitive approach to the question of *emic* and/or *etic* conceptions of time in music that is a novelty.<sup>83</sup> An *emic* conception of the time of music must prove that the actors of a certain culture can be tested as implicitly or explicitly associating time beliefs with musical time. An *etic* conception of time is considered general, associating with particular contexts general understandings of time and time in music.

Notice that when the connection of time in music/time in general is studied, it is investigating, first, the general structures of time as belonging to certain cultures and understandings of time that connect with time structures in music not necessarily as a causal relation but as supporting an ideological field, and second, the effective

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<sup>80</sup> Øhrstrøm, 1995, pp. 3–4.

<sup>81</sup> McGraw, 2008, p. 42.

<sup>82</sup> Rowell, 1979, pp. 96–106.

<sup>83</sup> Ian Cross, *et.al.*, 2008, p. 55.

experience of time itself that requires for example, measuring objective time perception vs. subjective time perception.<sup>84</sup> Only the first option is considered by this thesis.

As was seen, little by little musical time as a topic of research leads to inquiry into philosophical methods available—i.e. phenomenology, temporal logics. This thesis is characterised by not following one method but partly both. Before going into this particularly hybrid point of view, some of the latest important writings, which continued opening the theoretical debate and expanded the terrain towards future, applied developments, deserve consideration.

The latest theorising on musical time is found principally in the field of aesthetic semiotics, philosophy of music, and musicological studies in general. Thomas Reiner, published a *Semiotics of Musical Time*,<sup>85</sup> offering a division in *poietic*—compositional, *esthesis*—perceptual—, and neutral—textual—levels in relation to the study of time in music. This view, applied to musical time studies, does not seem novel in its essence; Jonathan Kramer had noticed already that “[t]he categories (temporal modes) apply variously to compositions, to listening modes, to performing modes, to philosophies of composition, and to time itself.”<sup>86</sup>

The power and importance of detecting the collaboration between realist and phenomenological approaches to the topic is a line well delineated by semiotic analyses today, which is the bridge where this thesis is situated.

The most evidently non-semiotic properties of musical time are the previously identified inherent temporal features of the physical occurrence of sound: duration, simultaneity, succession, frequency, and temporal order. They are non-semiotic in the sense that they exist as properties of the external world, independent of human observers and independent of human interpretation. Moreover, they are objectively verifiable properties of the physical universe in general.<sup>87</sup>

Reiner remembers that Husserl appropriately had thought that the real world did not have to be a phenomenon:

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<sup>84</sup> For an interesting application of studies concerning this phenomena in the computer field: Desain P., Honing H., “The Quantization of Musical Time: A Connectionist Approach,” *Computer Music Journal*, 1989.

<sup>85</sup> Reiner, Thomas, *Semiotics of Musical Time*, 2000.

<sup>86</sup> Kramer, 1988, p. 61.

<sup>87</sup> Reiner, 2000, p. 214.

(A) real thing or the real world is not a phenomenological datum, so also world-time, real time, the time of nature in the sense of natural science including psychology as the natural science of the psychical, is not such a datum.<sup>88</sup>

By this assumption then Reiner accepts, as it is accepted in this thesis, the possibility of an interpretation of musical time as non-semiotic but with restraints: “[N]o semiotic theory of musical time can prevent such a positivistic definition, and yet, semiotic thought can encourage arguments against it.”<sup>89</sup> Afterwards, Reiner concentrates on enumerating ways musical time can be approached, which are still of a non-semiotic nature:

1- [A] definition of musical time based exclusively on inherent temporal properties ignores the recognition of music as music. Unless one wish to propose that music is intrinsically musical, irrespective of whether it is recognized as music or not [...], one must acknowledge the necessity of the human act of interpretation for the actualization of music.

[...]

[S]emiotic thought [on the contrary] help one to understand that to equate inherent temporal properties and temporal relationships with musical time is an act of conception. That is to say, to subsume inherent temporal properties and relationships under musical time amounts to forming a concept: inherent temporal properties and relationships are combined to form a concept of musical time.<sup>90</sup>

This first possible way of dealing with musical time as a ‘neutral’ topic of research, for example as it is found in Marsden’s approach, does not mean any doubt about the legitimacy or usefulness of it. This investigation follows the *conceptions of musical time*, instead of its exclusive inherent temporal relationships. Such a stance obliges the making of a *qualitative* jump between temporal relations and temporal relations in music.

2- The physiological processing of temporal data associated with the perception of sound is another non-semiotic constituent of musical time.<sup>91</sup>

Alan Marsden later adopts temporal logic as a method for framing physiological factors in performance timing.<sup>92</sup>

3- Music’s recognizable temporal features and relationships can [...] be conceived of as another non-semiotic property of musical time.<sup>93</sup>

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<sup>88</sup> Husserl, Edmund, *The Phenomenology of Internal Time-Consciousness*, 1928, §1, p. 23.

<sup>89</sup> Reiner, 2000, p. 215.

<sup>90</sup> *Ibid.*, pp. 215–216.

<sup>91</sup> *Ibid.*, p. 217.

<sup>92</sup> Marsden, “Timing in music and modal temporal logic,” *Journal of Mathematics and Music*, 2007, pp. 173–189.

This case can be manifested when one assumes temporal relationships in music, but does not think they are qualitatively different from those relations external to music.

4- [T]he recognition of temporal features is possible without semiosis, and thus regards recognizable features as well as their recognition as non-semiotic.<sup>94</sup>

Reiner's points 1 and 3 are rejoined in this abridged sentence 4, where he accepts the possibility of an investigation that admits both neutral recognition and a neutral approach to musical temporal relationships.

5- [T]here is still one more possible conception that merits consideration [...], the equation of musical time with the experience of musical time.<sup>95</sup>

According to Reiner Karlheinz Stockhausen (1928–2007) had thought about an unreflective perception of time, as is clear from what follows: “[I]f we realise, at the end of a piece of music—[...]—that we have ‘lost all sense of time,’ then we have in fact been experiencing time most strongly.”<sup>96</sup> According to Reiner, “granted that an experience involves a conscious encounter with something that is being experienced, an unreflective experience of musical time is a contradiction in terms.”<sup>97</sup> Stockhausen then is thinking musical time as a non-conceived or non-semiotic fact but because its experience itself is unreflective.

The risk here is that Reiner ends up defending a semiotic view as superlative in comparison to non-semiotic approaches to musical time. There are many sides to the same topic and any of them should be read as possible, but not exhaustive, ways of dealing with it. Moreover, other viewpoints—non-semiotic—seem to contribute together with semiotic perspectives to a more comprehensive and total overview of the topic at hand.

According to Reiner, the semiotic view is more convincing for the following reasons:

[T]he narrowness of a non-semiotic view of musical time is brought out in a sharp relief when compared to a semiotic one, which embraces such vital elements as a composer's conception of sound constellations as an expression of musical time, a composer's notational encoding of temporal features of a musical work, a performer's identification and interpretation of temporal

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<sup>93</sup> Reiner, 2000, p. 218.

<sup>94</sup> *Ibid.*, p. 219.

<sup>95</sup> *Ibid.*, 220.

<sup>96</sup> “Structure and Experiential Time,” *Die Reihe*, 1959, p. 65.

<sup>97</sup> Reiner, 2000, p. 220.

features of a musical work notated in a score, and a composer's, a performer's, and a listener's awareness of musical time as a result of interpretative responses.<sup>98</sup>

Without doubt, the semiotic enterprise allows for more experiential, and directly linked to aesthetic, research around time in music. However, the non-semiotic view provides tools for clearly displaying a theory about general time and its relationship with particular time in music and helps to inform and decide in practical cases, not totally far away from musical practice and creation.

Another previous semiotic work had offered a view of temporality appealing to logic. Eero Tarasti's (1948) *Theory of Musical Semiotics*<sup>99</sup> sketches an application of Henrik von Wright's logic of change, as it was developed in *Norm and Action* (1963), with the original purpose of systematising action having motivation in the field of jurisprudence. Tarasti noticed the weakness of old theories of music, which had transformed the durational time of music into spatial time. From his point of view, it was necessary to apply the logic of change or movement to give an account of the true nature of music. Given the procedural nature of music, the musical logic that will be developed cannot be based on any logic of a static world, but on a logic that takes into account the unfolding of music in time. Read under the later work of Reiner, Tarasti's insights should be described as developing fundamentally the *esthesic* level of a semiotics of musical time.

The basic operation in von Wright's logic, 'pTq', denotes the transition from a state *p* to a state *q*. In this sense the kinetic aspect of music might be formalised with these tools: A motif or section *p* is followed by a motif or section *q*; but as the musical process is supported by expectations, so an additional symbol is needed: 'pTTq' or 'p→→q'. That means that after *p*, *q* is expected and *q* follows. Finally, sometimes something contrary to expectation happens, so it will be formulated as 'pTT(q)x'. That means 'after *p*, *q* is expected, but *x* follows'.

According to Tarasti, the paradigm of constant becoming is an aspect; which brings another paradigm based on the listener's memory. It consists of all earlier choices and changes along the process of the composition. Here it is necessary to point out that the memory presupposed by a text varies from one composer to another. One factor that helps memory is that of 'double articulation': If the first technical level is known, then the listener will be free to receive individual features of a work and composer.

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<sup>98</sup> Ibid., p. 230.

<sup>99</sup> Tarasti, 1994, pp. 20–22.

The reference functions in the musical work form a contrary force against the dynamically moving nature of music. The formula 'pTTq (1)', 'after *p* one expects *q*, which follows and refers to an earlier element 1'. This element *in absentia* is as important as the elements *in praesentia*.

In the case of a teleological musical process, this should be presented with the scheme 'pTTq(p), where '*q* is a musical unit that is at the same time expected and refers to the element preceding it'. It is perceived as if it were the objective of the process, like the occurrence of a theme in its definitive form at the conclusion of a composition. Such musical process is predetermined but, of course, there is music that can also proceed without any determined direction, for example monodies not having an exact beginning or ending. There are also multileveled musical processes, where the determinism of the various levels has different degrees, illustrated for example by cadential sections in traditional solo concerts.

In addition to the logical representation of progressive and retrospective aspects of the musical process, then a third factor should be considered: the paradigm of all possible choices. In a certain moment of transition expressed by: 'pTT(q) r [q, r, s]', 'if after *p*, *q* is expected but *r* occurs and after *p*: *q*, *r* or *s* is possible', such a description preserves the energetic nature of music.

In an abridged form, this logic helps Tarasti to present the three following paradigms for a description of music as a process:

- 'Paradigm of progression': 'pTq' or 'pTTq' and 'pTT(q)x'. These mean respectively 'a motif or section *p* is followed by a motif or section *q*', 'after *p*, *q* is expected and *q* follows' and 'after *p*, *q* is expected, but *x* follows'.
- 'Paradigm of retrospection': 'pTTq(1)', means that 'after *p* one expects *q*, which follows and refers to an earlier element 1'. Also, 'pTTq(p)', which means '*q* is a musical unit that is at the same time expected and refers to the element preceding it'.
- 'Paradigm of all choices': 'pTT(q) r [q, r, s]', that means, 'if after *p*, *q* is expected but *r* occurs and after *p*: *q*, *r* or *s* are possible'.

Tarasti mentioned the possibility of a musical temporal logic. However his idea was not in delineating any modes of musical time, nor concerned with connecting them with philosophical ideas on time.

Alfonso Padilla (b. 1949) worked with both the concepts of space and time in music.<sup>100</sup> According to Padilla, there are four general issues to be considered with respect to time in music. These issues are well systematised:

- 1) The matter of signification: Some authors identify time with the specific parameters of tempo, rhythm, and meter—strict notion; whereas others include pulse, phrase, articulation, breath, and form: in brief, all parameters—wide notion.
- 2) From what point of view temporality has to be considered: the composer, the listener, or the analyst. The composer works with a spatialized notion of time; the listener perceives temporality as a subjective experience; the analyst works on the spatialized version of the score.
- 3) The third matter is that we always speak in metaphorical terms. Music works with fictional times that are not consistent with the ontological and absolute point of view, which reduces all processes to a line.
- 4) The fourth is that opposite categories should be treated as complementary. Tempo can be immutable while timbre can be changeable in extreme. There is no pure stasis or pure mobility in music.

Padilla, in Reiner's terms, deals mainly with the *poietic* aspects of temporality in music. He presents the topic of time in music through a study of the Boulezian categories of time. Pierre Boulez's divisions for musical space are identically applicable to musical time: *homogeneous*—exclusively plain or segmented /*heterogeneous*—mix, superposition, alternance of plain and segmented times. Plain times have neither ruptures nor modules; segmented times are *pulsed/amorphous* times. Homogeneous times can be divided into *straight, bent, regular, and irregular*. Boulez developed also distinctions for *tempi*. All these concepts came from Paul Klee's reflections. Padilla explains that Boulez was aware of the dialectic play of *continuous/discontinuous, linear/non-linear, directional/non-directional*. Thus, non-linearity occurs inside linearity, discontinuity inside continuity, and non-directionality inside directionality. *Uni- or multilinearity, uni- or multidirectionality* are also possible.<sup>101</sup>

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<sup>100</sup> *Dialéctica y música- Espacio sonoro y tiempo musical en la obra de Pierre Boulez*, 1995, pp. 105–122.

<sup>101</sup> Padilla, 1995, pp. 119.

Padilla's thesis concludes that space and time in music are indissoluble, showing Boulez's dialectic point of view in this topic. His notion of *sonorous space* understood in a wide sense, includes time.<sup>102</sup>

Semiotic approaches to musical time continue to develop. Significant works are Raymond Monelle's (1937–2010) chapters in *Signs & Time*<sup>103</sup> and *The Sense of Music*.<sup>104</sup> And lastly, a predominantly historical book fundamental for this research, is Karol Berger's (b. 1947) *Bach's Cycle, Mozart's Arrow*.<sup>105</sup>

Berger, in his new book on music and temporal ideas, comments on the transition that took place around 1750, from an idea of cyclical time to time conceived in the form of an arrow, and consequently, how this had an impact on the music of the epoch. Monelle, in turn, worked with pairs of oppositions to reach his main thesis: Cyclical vs. historical time in anthropology, clock time vs. *duration* in the West, to arrive finally to the categories of lyric vs. progressive times in music. Berger mentions neither this previous also relatively recent study, nor another important and connected article by the same author on, precisely, Bach's temporality. This thesis will show these connections.

In sum, this topic is in a state of fresh, concrete, empirical, and historical ongoing research. In this spirit, this thesis attempts to add sketches of connections between time in general with time in Latin American music, specially the music of Alberto Ginastera. The difference with these approaches is the general theories and methods of departure. Instead of semiotics, cultural history, and anthropology, this thesis employs the philosophy of nature, theories of time, and temporal logic as the basis from which analogies and interpretations will be made.

## **1.2. Musical Time or Time in Music? A Convergence of Phenomenological and Ontological Views**

Two main philosophical tendencies have developed that study the topic of time in music. The phenomenological view, which coined the term 'musical time', an exclusive species of time which relies heavily on a subjective perceiving, is scarcely connected with the external time that natural philosophy and physics have reasoned over.

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<sup>102</sup> This thesis will come back to a discussion on space and time as metaphors for music in Ch. 2.

<sup>103</sup> Monelle, Raymond, "Real and Virtual time in Bach's keyboard suites," *Signs & Time, Zeit & Zeichen*, 1998.

<sup>104</sup> Monelle, *The Sense of Music*, 2000, p. 93.

<sup>105</sup> Berger, Karol, *Bach's Cycle, Mozart's Arrow. An Essay on the Origins of Musical Modernity*, 2007.



Temporal logical models based on external time are useful for philosophical reflection through their neat account of the different ontologies of time. Ultimately these models have been applied, for example, in music computing and computer music. Phenomenologists disregard time as an objective dimension applied to any entity, real or fictional. On the other hand, the ontological view, speaking about Time in abstract, emphasises the common linear passing, its objective measurement, diminishing the importance of music as an essentially fictional activity whose temporal forms do not coincide with ordinary time. Both tendencies were considered and progressed traditionally in opposition, and hardly new enriched views developed on the matter. This work examines a third position: a sense of the phenomenological—specifically musical, subjectified, and historic aspects are included, and a sense of the ontological—a clear treatment of the various conceptions of time is adopted without taking one as predominant, a plurality of times, considering that each position can offer some insights. Finally, a compatible and comprehensive picture of the *time of music*, neither just ‘musical time’, nor Time in music, is offered. The aim of this hybrid approach is to blur the dividing line, searching for a philosophical convergence or dialogue, and to show at a certain point that there is no conflict.

Generally, the topic of time in music involves two considerable problems: that of time, and that of music. Many theories of time have developed in philosophy and physics. What constitutes time was always a common problem. That is, of what sort of individual units time is made of, i.e. either points, defending the reality of instants, periods, considering instead, intervals or durable moments in time, or events, where time is a relative concept, depending on things that happen at that time. Another problem is its nature, whether time is an objective or subjective condition, an external or an internal dimension. Furthermore, certain cultures and certain periods tend to perceive time with determinate shape, for example linear, circular or branching.<sup>106</sup>

Regarding a definite idea of what music is the answer is also plural. It can have different meanings in various cultures, through the same culture, and eventually, within the work of the same composer. In this study, music is considered as a universal way of expressing through sounds, consciously or unconsciously, *primarily* an idea and experience of time. This universal, which implies very general notions of time, is nevertheless recognised as being concretised through different musical technical-stylistic resources.

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<sup>106</sup> The seemingly strange cultural idea of time as branching off into different directions in relation to music is already encountered in Kramer, 1988. In his opinion, it is connected with our contemporary Western understanding of temporality, typically represented in computer-like thinking, where it is usual to “branch off, return to earlier states, and loop”, pp. 13–14. Philosophical and literary references about branching time will be offered later in Ch. 5.

Temporal logic is a formal language that is used here to unveil temporal conceptions of time in music. This logic describes, formally, assumed metaphysical conceptions of time hidden in verbal expressions, such as linear, finite, continuous or discontinuous, etc. These notions of time were traditionally intuitively developed throughout the history of philosophy and it is in temporal logic where they meet the strictness proper of the 'linguistic turn'. Temporal logic thus provides a neat language for theoretically dealing with time assumptions, not for discovering what time actually is, as physicists for example are concerned with, for validating temporal expressions, and nowadays, for using it in the design of computing automata. Here, concretely considered, it proves useful for analysing those conceptions of time assumed or hidden in musical expressions. In the end, an important goal is to push forward the idea of a 'musical logic' as established in musicological literature, including jointly the circular and the branching as part of the temporal palette of contemporary music, contributing then to the modelling of different forms, in addition to the classical linear time form.

The study of temporal structures in music aims to offer a clear method that can later be used to observe the impact of diverse ideas of time in recent music. The 20<sup>th</sup> century has offered novel conceptions of form—for example, what can be called the branching and multiple linear ones, whereas in earlier eras other forms dominated when dealing with musical time, i.e. the linear. Moreover, the connections established between cyclical music and diverse conceptions, on the one hand of religious time, and on the other with repetition up to the point of saturation and pointlessness in minimalist music, are abundant.

Alan Marsden (b. 1959), musicologist and computer engineer, used temporal logic as a means for evaluating systems of music representation through computers. In the first chapter of his book, which deals with theoretical issues concerning music, time, and logic and the ontology of musical time, he distinguishes his view from phenomenological approaches to musical time of the sort developed by Susanne Langer, Jonathan Kramer, and others. Marsden separates his logical vision from phenomenological visions of musical time right from the beginning. In this thesis instead, the first logical approach is used for developing a philosophical reflection about the second one: logic is the bridge for reasoning about the philosophical implications around these non-standard modes of musical time.

Marsden defines musical time in opposition to the phenomenological approaches. This becomes clear through the following quotation:

Musical time is that aspect of music which is impersonal, and which can be abstracted from the music and manifested in some domain other than sound, but which in any proper manifestation necessarily invokes the concepts of 'before' and 'after'.<sup>107</sup>

The delimitation of his view consists then of the following three key statements: 1. That musical time is considered objectively or taken axiomatically, as existing independently of human experience; 2. That the time to which music belongs defines abstract properties not exclusive to music; 3. That musical time participates in the relation 'before–after', in that it exists in ordinary time.

The above description of Marsden's view serves to clarify the goal of the present study. Here, however, the amendments are: musical time is that aspect of music that only can be conceived as 'impersonal', when thinking about its technical manipulation, but which in the artistic domain is personally experienced and creatively explored. Musical time can be abstracted also, but it is not the concern here when the purpose is dealing with the special time that music creates. The *time of music* presupposes a kind of totally novel material: pitch, rhythm, harmony—among other important parameters—and seemingly, a characteristic multidimensionality, many temporal levels working together. Finally, Marsden invokes the 'before–after' relation since music is a species inserted in ordinary time. Notwithstanding, the time of music evokes diverse modes, challenging our common perception of time.

This convergence of views implies: 1. That musical time is not considered as exclusively apart from a 'perceiving, creating, or thinking'<sup>108</sup> person, so also the context of its experience is taken into account; 2. That time in music is in fact manifested through sound and seen as a special case of created time, working with 'quasi-events'<sup>109</sup>; and 3. That this time is participant in the characteristics of real time and axiomatically portrayed times, but it is reinterpreted within its fictional goal, as an artistic time. In summary, the time of music is not impersonal, not abstract, and not real. This whole position assumed then, conceding its eclectic nature, considers the lines expressed as opposite by Marsden, i.e. phenomenology and ontology, to be complementary from the beginning.<sup>110</sup>

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<sup>107</sup> Marsden, 2000, p. 5.

<sup>108</sup> Id.

<sup>109</sup> This idea is developed by Scruton, Roger, in *The Aesthetics of Music*, 1997, pp. 11–12. It consists of thinking about musical events as *pure events*, not as those real events in the world, to which we can add certain properties. For example, in the event of a car crashing, one sees the car that crashed; this constitutes the event. In music, there is no 'material' reference to which one can add the properties.

<sup>110</sup> The proposal could be seen as a musical variation of Fraser's "Time Felt, Time Understood," *Kronoscope*, 2003, pp. 15–26. Interestingly, music appears there as a manifestation that contains the conflict expressed in title of this subsection, between both approaches about time.

Temporalist and atemporalist views on time influence the decision for a particular approach to the problem of musical time. Temporalists view time as something passing, flowing, and as a subjective condition, while atemporalists will instead tend to see time as permanent: the measure over things changing, an objective dimension. Both traditions come from Platonist and Aristotelian<sup>111</sup> ways of seeing time respectively, although previously, from the old Hebraic and Greek<sup>112</sup> views. The A/B series noted by Mc Taggart, namely in his past–present–future/before–after distinctions, is a contemporary version of these approaches. In a distant analogy, these two versions of temporality reflect the time in which the performer/listener or the composer/analyst is inserted. Performers and listeners are positioned within a time whose reference points change constantly—something was future, is present and then will be past—while composers and analysts work with events that have been fixed for ever—some are earlier, others are later—in this sense dealing with unchanging points of reference.

Susanne Langer analysed the problem of the analogy between music and interior life.<sup>113</sup> According to her view, music consists of the creation of a *virtual time*: an appearance of the organic movement of our temporal essence as human beings. Virtual time would be separated from “the sequence of actual happenings” identified with the real, clock time. In this sense, Langer’s approach could be seen as reflecting a position on musical time linked with the above mentioned temporalist view.

Musical duration is an image of what might be termed 'lived' or 'experienced' time [...] Such passage is measurable only in terms of sensibilities, tensions, and emotions; and it has not merely a different measure, but an *altogether different structure from practical or scientific time*.<sup>114</sup>

Langer recognised the importance of physical studies (acoustics) for the analysis of music. However, she thought that they were unable to explain the *substance* of music, which is rather found in the *illusion* that music creates. This is revealed by two facts. One is that, although we perceive movement in music, nothing moves; musical motion is different from physical displacement, or it is only a semblance of it.<sup>115</sup> Another element that has no parallel in physics is that of sustained rest. She demonstrates that

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<sup>111</sup> McGinnis, Jon, *Kronoscope*, “For Every Time there is a Season: John Philoponus on Plato and Aristotle’s Conception of Time,” 2003, p. 83.

<sup>112</sup> ‘Tiempo’, in Ferrater Mora, *Diccionario de Filosofía*, 1994, pp. 3494–3509.

<sup>113</sup> Langer, 1953, pp. 104–119.

<sup>114</sup> *Ibid.*, p. 109. Italics mine. Langer took this thesis from Basil de Selincourt, who wrote: “Music is one of the forms of duration; it suspends ordinary time, and offers itself as an ideal substitute and equivalent.” Henri Bergson’s idea of *pure duration* is hidden here. Distinct from Bergson however, she thinks of musical time as symbolic, not as intuitive and given immediately; thus, having form and organisation, volume and distinguishable parts. This distinction is given in Fubini, 1990, p. 363.

<sup>115</sup> As Scruton shows, physical translation supposes the same object moving from A to B; in music, a tone C moves to a tone D creating the *illusion* that music moves; 1997, p. 51.

when a progression arrives at its point of rest, music continues moving even if there is a silence. Moreover, she thinks the elements of music are not the merely technical, i.e. pitch, chords, and keys, but the artistic ones, which are virtual and created for the sake of being perceived.

Musical time is according to Langer's view "entirely perceptible". "*Music makes time audible, and its form and continuity sensible.*"<sup>116</sup> Musical time is different from real time, which is "composite, heterogeneous and fragmentary". Marsden attempts an explanation of the characteristics of clock time as understood by Langer:

[C]omposite presumably because we compose a sense of time from various observations of change in the environment, our memories and a rather loose sense of 'time passing'; heterogeneous because we have different senses of time in different circumstances; and fragmentary because we are not aware of the entire passage of time—we sleep through some of it, for example.<sup>117</sup>

At this point, Langer's distinctions between real and virtual time are considered here not at all convincing. These arguments do not preclude the possibility of having the same experiences with the musical, 'illusory' time. However, for the moment a neutral presentation of her position is pursued. Another difference she acknowledges between actual and virtual time is its structure, its logical pattern, which is not of a "one-dimensional order".<sup>118</sup> The clock interprets time as pure sequence; it is a one-dimensional continuum and its advantages for practical purposes kill many aspects of our perception of time that are particularly interesting.

The underlying principle of clock time is change, which is measured by contrasting two states of an instrument. [In clock time i]t is the 'states', 'instants', [...] that are symbolised [...] 'Change' is not itself something represented; it is implicitly given through the contrast of different 'states', themselves unchanging.<sup>119</sup>

Measured time is essentially different from what we know from our direct experience, which is passage. These passages are described as having '*volume*',<sup>120</sup> a volume that is filled with its characteristic forms. And the forms filling time are tensions—physical, emotional or intellectual. "[L]ife is always a dense fabric of concurrent tensions, and as each of them is a measure of time, the measurements themselves do not coincide."<sup>121</sup> This means that the time of music cannot be reduced to a

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<sup>116</sup> Langer, 1953, p. 110.

<sup>117</sup> Marsden, 2000, p. 2.

<sup>118</sup> Langer, 1953, p. 111.

<sup>119</sup> *Ibid.*, p. 112.

<sup>120</sup> *Id.* And Langer adds an explanatory slang-phrase "[to have] a big time."

<sup>121</sup> *Ibid.*, p. 113. Here she expresses support on Husserl and Heidegger's philosophies of time.

physical nature, and that in order to catch its true nature it must be understood as filtered by a metaphor, ‘as if’ it were time, but a very special sort of recreated lived time.

Different from Langer, for Kramer musical time is a mix of lived and measured times. “I am interested in the *interaction* between musical and absolute time”<sup>122</sup> he says, taking a pluralist point of view on the topic. Alan Marsden thinks similarly about the double nature of tempo, an aspect of musical time. He finds an interaction between the objective-notated, expressed in absolute time and the subjective-interpreted, relative time:

Musicians commonly relate the two, referring to a tempo as so many crotchets (quarter notes) per minute. Furthermore, while, in a particular performance, the quantity of time in seconds occupied by the sound of one note of a crotchet’s duration might be different from the quantity of time in seconds occupied by another crotchet, the difference is likely to be less than that between that crotchet and any quaver (eight notes) in the same tempo. The two kinds of time constitute two different levels for describing time, but they can be related.<sup>123</sup>

The relationship between objective–notated time and subjective-interpreted one is just one aspect of a whole position about time in music. Interestingly, Kramer and Marsden coincide regarding this topic but they are opposite in general terms, as was presented in the introduction: one is departing from phenomenology (appearances as constituted by a conscious subject); the other from ontology (objective reality independent of any perceiving subject).

Kramer’s modes of musical temporality are presented followed by a brief theoretical explanation:<sup>124</sup>

- 1) *Tonal (goal directed) Linearity*: the existence of certain implications that arise earlier in the piece and determine further characteristics (antecedent–consequent relationships) in tonality.

*Predictable*: what one hears at the beginning announces what one is going to hear later on.

*Non-predictable*: what one is hearing is interrupted by a surprising event, which nevertheless emphasises the linear sense of the whole.

- 2) *Atonal (non-directed) Linearity*: the existence of certain implications that arise earlier in the piece and determine further characteristics (antecedent–consequent

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<sup>122</sup> Kramer, 1988, p. 3.

<sup>123</sup> Marsden, 2000, p. 3. This same problem was addressed under a philosophical perspective in Calleja, “El problema de la ambivalencia del tiempo en la música”, 1999.

<sup>124</sup>

relationships) in atonalism, that work without the *a priori* goal definition of the tonal system.

*Predictable*: when one can guess what is going to happen. In atonalism this situation is provoked by means of reiteration or emphasis.

*Non-predictable*: when one does not know that a cadential harmony is going to happen until one arrives, where cadences are created by non-pitch parameters such as thinning texture, decreasing dynamics, slowing tempo, and so on.

- 3) *Tonal Non-linearity*: presents two variations
  - a) Unchanging pattern exists, such as textural consistency.
  - b) Formal proportions can be found in the piece.
- 4) *Non-tonal Non-linearity*: when discontinuities begin to prevail, destroying the linear progression by moments of pure sonority, appreciated more for themselves than for their role in linear progressions.
- 5) *Multiply-directed Linearity*: pieces in which the direction of motion is frequently interrupted by discontinuities. The music goes so often to unexpected places that linearity, though still a potent structural force seems reordered.

*Tonal*: tonal music is susceptible to multiply-directed listening, processes are well defined, so the goal orientation can be understood even when the goal is not reached immediately. It contains gestural conventions such as beginnings, final cadences, transitions, climaxes, which can be recognised even when they occur in an unusual part of a piece.

*Non-tonal*: although without a clear perceptible tonal linearity it is difficult to understand a reordering as such. Furthermore, in atonal music there are no conventionalised gestures as cadences, beginnings, and endings.

- 6) *Moment time*: presents two levels
  1. Moments are self-contained musical events. They are heard more for themselves than for their participation in the progression of the music, and defined more by stasis than process.
  2. The extreme of moment form in which the order of moments is arbitrary, is mobile form: the composer indicates that the sections of the piece may be put together in any of a number of possible orderings from one performance to the next, perhaps with certain restraints.

- 7) *Vertical time*: Some works demonstrate that phrases are not necessary components in music. The result is a single present, a potentially infinite ‘now’. A vertical piece does not begin, it merely starts; it does not build to a climax, does not propose internal expectations, does not build or release tension, and does not end but simply ceases. No event depends on another event; the whole piece is like a large event.
- 8) *Total Linearity and Total Non-linearity*: In total linearity, the composer works in response to a fixed preceding section. On the contrary, in the case of total non-linearity, each event is composed without any reference to preceding or subsequent events but for itself.

Lewis Rowell, in his review to Kramer’s book summarises the problems arising from this type of approach to the time of music.<sup>125</sup> Kramer first goes against the common vision of musical temporality as it is described by musicians in the technical terms of “beats, accents, durations, rhythmic patterns, meters, rates of motion and even pitches”.<sup>126</sup> Musical time is for Kramer—as well as here—the overall structure in time created as a result of the craft made by all the intervening parameters in the music. This means that it is not exclusively related to the traditionally associated elements, having instead a literal temporal meaning. Second, Kramer’s view opposes that of philosophers that search for “ontologically valid descriptions of reality”.<sup>127</sup> Rowell finds Kant and Einstein to be a background to Kramer’s view in a very general sense. Explicitly, the former saw time as an *a priori* condition for the perceiving subject; the latter a relative concept depending on the referential point of observation; very generally both commented on a subjective condition, instead of an objective dimension, outside any observer. Third, there is the quandary question that music unfolds in time but no time unfolds in music, i.e. there would be no time exclusive to music. Finally, Kramer’s conclusions could be negated by a more rigorous approach to music perception, based on statistics. Despite all these possible critiques, Rowell gives a green light to Kramer’s proposal,<sup>128</sup> interpreting new temporal modalities as “new stability and helpful ways of coordinating our perceptions”, a system that could be thought of in the future as comparable with the modal/scalar or tonal system that we have today. The above mentioned critiques, specifically the second and third one, Rowell gives in relation to Kramer’s book, are treated in this thesis in search of a synthetic answer.

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<sup>125</sup> Rowell, ‘Review of *The Time of Music*, by Jonathan D. Kramer’, *Journal of Music Theory*, 1990, pp. 348–359.

<sup>126</sup> *Ibid.*, p. 357.

<sup>127</sup> *Ibid.*, p. 354.

<sup>128</sup> *Ibid.*, p. 359.



Julius Fraser's (1923–2010) theory of time, from which Kramer took the above mentioned temporal modalities for music, deserves to be mentioned. According to Rowell's review, Kramer did well to pay attention to such a vision of time: as "time is indeed not a single thing, but a nested hierarchy of individual times with different properties, horizons and thresholds, we have not one, but an array of models available for musical representation."<sup>129</sup> Summarising the last chapter of Kramer's book where Fraser's theory is exhibited briefly, one can see clearly the genesis of those new temporalities for music. Fraser's evolutionary levels of time found in physical and mental worlds, from lowest to highest, followed by Kramer's own interpretation for music expressed in brackets, are:

1. *Atemporality*: no past, no future, no earlier–later relation but simultaneity prevails. (*Vertical time*).
2. *Prototemporality*: given two events, any possibility of distinguishing which is earlier and which is later. No simultaneity. (*Moment time*).
3. *Eotemporality*: succession but still no direction. (*Multiply-directed Linearity*).
4. *Biotemporality*: events are ordered from past to future but not overall logic of progression exist. (*Non-directed Linearity*).
5. *Nootemporality*: past and future have a large-scale sense of direction. (*Linearity*).<sup>130</sup>

Phenomenological can have various meanings in relation to musical time studies.<sup>131</sup> A first meaning here consists of interpreting phenomenological mainly as in Langer's work, implying a virtual, symbolic of internal time. A second meaning of phenomenological can be taken from Kramer, in the sense of an 'evoked' instead of a 'taken' time. The views chosen 'overact' the topic of musical time, as if music would deserve a completely separate experience of time, unlike other temporal experiences. Thus, either they tend to add characteristics to musical time that are shared by other experiences in time, or are ultimately obscure. For example, Langer's above-mentioned 'big time' that music, so to say, 'opens' to us. It is at least suspicious that only music could provide this sensation, it is also an extremely personal association.

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<sup>129</sup> Ibid., p. 352.

<sup>130</sup> Fraser, 2004. Kramer found no use for Fraser's 'sociotemporality'. Interesting application is found in Carballo, 1996.

<sup>131</sup> Other variation can be found in Christensen, Erik (b. 1945), *The Musical Timespace: A Theory of Musical Listening*, 1996.

Van Benthem suggests however the advantages of approaching these topics with logical tools, i. e. the logic of time, a perspective that is going to be considered immediately afterwards:

Our experience that ‘time passes’ transcends all theoretical description. A colleague once told me that, therefore, the present enterprise [the logic of time] is a priori doomed to failure. Did not Heidegger show convincingly that the structure of Time can never be separated from that of our living experience? Quite the opposite is true. Logical studies of Time do manage to isolate and investigate formal structures and, in doing so, our experience of this phenomenon is enhanced rather than dulled.<sup>132</sup>

Marsden’s approach reflects, in principle, the atemporalist view of time. His use of temporal logic and especially of one particular sort, the *chronological logic*, inscribe him in this tendency. Chronological logic works with definite statements or ‘genuine dates’ such as ‘In 2001 there was an insurrection’, whose truth-value is fixed for all time. Atemporalists tend to interpret time from an ‘out’ perspective. In comparison, other approaches in temporal logic, namely, *tense logic*, work with assertions of the type ‘Tomorrow there will be an insurrection’, in which the truth-value changes according to the point in time at which the assertion is made. This last assertion is made, stated instead from ‘inside’ time.<sup>133</sup>

In music computing, temporal logic serves however not only to describe ‘external’ relations of temporal order, such as linear or circular, that will be introduced below. It is also useful to represent ‘internal’ time situations, where the time represented is the same as that inhabited by the user of that time. In-time logics are required for modelling the listening process in general (memory and anticipation in actual situations)<sup>134</sup> and for questions of actual timing, i.e. in the design of automata, to perform music in real time, and ultimately, for providing a logical reflection about human cognition and timing.<sup>135</sup>

The use of temporal logic as a general means for a reflection on musical time is a novelty inside musicological literature. Marsden wrote on this perspective, however with a practical, technical aim. He uses temporal logic as a language that allows the comparison and evaluation of the different properties and expressive capacities of systems of representation for musical time. As he deals with computing problems, the use of temporal logic is associated with the detection of the best practice in terms of inferences and processing, and a maximum fidelity in terms of what has to be transmitted by a computer.

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<sup>132</sup> Van Benthem J. F. A. K., *The Logic of Time*, 1983, xi–xii.

<sup>133</sup> Notice here however the difference of method from Langer’s temporalist view.

<sup>134</sup> Antecedent study applying modal logics in Kunst, 1978.

<sup>135</sup> Marsden, 2007.

For Langer, music requires an approach different from formal logic, although, at the end, she does not defend an opposition between logic and intuition in her work: “[...] instead the application of logic can lead to new intuitions.”<sup>136</sup> This last idea is promising for a reflection of the sort intended here. Logic serves not directly but indirectly in awakening new artistic possibilities, it does not create them. If a logico-philosophical view of musical time can provoke such awakening it is by providing an insight into temporal matters that may be fruitful indirectly, for performing and composing.

According to Kramer, musical time is not amenable to formal logic, because it is not associated with the law of contradiction—‘something cannot be and not be at the same time and with the same respect’. This is shown in his opinion by the fact that actual and musical time intervene together in music, also by the fact that the same elements can behave simultaneously in different manners in a piece of music, e.g. high and loud. Finally, different levels of music can convey different qualities, e.g. something becoming louder in the microstructure, but appearing softer in the macrostructure. Kramer also refers to the contradiction of continuity/discontinuity, both present in a piece of music. Regarding this point, Marsden later replied to Kramer:

Even if he were to demonstrate that we can experience something in music as having contradictory properties on the same level, this would not mean that formal logic is *inapplicable* to musical time, but rather that Kramer, and others like him, *choose* to use a system of reasoning which is different from formal logic.<sup>137</sup>

Marsden seems to consider this point here under a different focus than that addressed by Langer and Kramer above. This suggests the necessary division of the topic of logic and music into three compartments: 1. If music has a ‘logic’ of its kind, i.e. ‘harmonic’, ‘thematic’, 2. If strict relations between music and formal logic born from propositional language can be demonstrated, and 3. If logic can be applied to the formalisation of music for specific determined purposes. Marsden has this last point in mind, whereas Langer and Kramer are associated with the second one which, by the way, presents merely distant analogies as result. Here, the first position is going to be developed and demonstrated as a middle position between the second and the third options.

The computer era brought the possibility of processing musical information and with it, new conceptual tools developed for tackling old questions in the study of music and time. As can be appreciated in Marsden’s book, the issue of musical time is oriented

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<sup>136</sup> Langer, 1953, pp. 378–379.

<sup>137</sup> Marsden, 2000, p. 12.

nowadays towards the definition of the best representations for being transmitted through a computer channel with the maximum possible fidelity.

Marsden focuses on the computer engineering field of inquiry, a problem which will be touched only partially here. Let us begin by explaining the key term in Marsden's study: 'Representation'. Representation is explained as a function mapping the abstract properties of a real thing with the symbols of a language of representation. Within this context, if representations are highly complicated, inferences are of the same kind, losing its use for practical aims. This means that if all relations are represented then there will be an unlimited and unmanageable quantity of information. The results Marsden obtains at the end then are of the following sort:

The most expressively powerful representations are shown to be computationally intractable, while those of least computational complexity are shown to be incapable of representing some types of music. A perfect system of representations is therefore impossible, and different representations are appropriate for different purposes.<sup>138</sup>

At this point there appears the association of Marsden's perspective with the 'ontological' view of musical time. In order to express temporal information explicitly, questions of 'substance' and 'structure' of the time of music have to be clearly settled. Substance includes the kinds of things time consists of: points, periods, or events, and structure comprehends the shape: linear, circular, or branching of time. Furthermore, 'extension' considers whether time is finite, infinite, or unbounded, and 'texture', whether it is discrete, dense, or continuous.

Marsden introduces key developments around shape, extension, texture, and substance of time found in temporal logic literature. Once the material is displayed, through the logical analysis, he advances in choosing what the best representations are, i.e. which of them seem more useful than others. The proposal here is concentrated on the same material but a philosophical or conceptual interpretation of the time of music is pursued in the end. An excursus to arrive at this kind of interpretation, which at the same time introduces grounds from the ontology of music, philosophies of musical language and conceptions of musical logic, is offered in the following chapters.

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<sup>138</sup> Ibid., Conclusion.

As if they would be not sufficient promises from the beyond, we search the way to persist in our land, so vilified and so loved. Almost everyone shares the desire to survive at work, in children, anyway. We are definitely moved by an instinct and at that point we at least equate to two insects in intelligence, the ant and the bee, and a rodent, the beaver or *castor fiber*.

Adolfo Bioy Casares<sup>139</sup>

For music, mysterious form of time.

Jorge Luis Borges<sup>140</sup>

## 2. Ontology

The ontology of music is the first issue to deal with for a philosophical reflection on musical time, i.e. the inquiry into the constitutive mode of being of music opens a direct access to the question of music as temporally conditioned. Traditionally, however, ontological questions in relation to music arises with the exclusive purpose of answering what a 'musical work' is.

The word 'ontology' is a scholastic product of the 17<sup>th</sup> century. Aristotle had called it 'the first science' but after him it was called 'metaphysics'—the science concerning things beyond physics. Metaphysics was traditionally divided into 'general'—the study of being in general—and 'special'—the study of the Supreme Being, the soul, and the world. The word 'ontology' appeared from the necessity for an exclusive term, which distinguished one field from the other—general from special—and referred to metaphysics as a general, discipline of formal character. In the 20<sup>th</sup> century, the word acquired different meanings according to different philosophies.<sup>141</sup>

'Ontology' in its traditional sense delineates all inquiry related to the most general ways of understanding the world, that is, the realities of this world. Ontology studies what is in general, the essence of objects and also the relations between things. Traditional topics in the field have been that of the existence of universals and how they

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<sup>139</sup> "Como si no bastaran las promesas del más allá, queremos perdurar en nuestra tierra, tan vilipendiada y tan querida. Casi todo el mundo comparte el afán por sobrevivir en obras, en hijos, de cualquier modo. Sin duda nos mueve un instinto y en ese punto al menos igualamos en inteligencia a dos insectos, la hormiga y la abeja, y a un roedor, el castor o *castor fiber*", *Historias de amor*, 'La obra', 1972, p. 99. Author's translation.

<sup>140</sup> "Por la música, misteriosa forma del tiempo", *El otro, el mismo*, 'Otro Poema de los dones', 1964, p. 270. Author's translation.

<sup>141</sup> 'Ontología', *Diccionario de Filosofía Ferrater Mora*, 1994, pp. 2622–2628, K–P; Hofweber, Thomas, "Logic and Ontology," *The Stanford Encyclopedia of Philosophy*.

relate to particular things, as it happens in the context of the debate over realism-nominalism. Also, it deals with the matter of events and how they can be understood as a byproduct of particulars and the relations existing between them.

In direct application to music, Stephen Davies states:<sup>142</sup> ‘Ontology is the study of the manner, matter and form in which things exist; so the ontologist may ask: what kind of thing is a musical sound or a musical work?’ This means that an answer concerning the nature of music and musical works, and an inquiry concerning the most general ways of understanding their being, are the principal goals pursued by the ontology of music.

Many authors have written on this field, but only a few of them presented ontology of music as such. Instead of this, a lot has been written around the ontology of the musical work. The argumentation supports on the one hand, Roman Ingarden’s<sup>143</sup> analysis of the musical work as an intentional, supratemporal object, and on the other Lydia Goehr’s<sup>144</sup> consideration of the musical work as a historical object, already from a post-analytic perspective.

The most important however is the study into the ontology of music itself, through which the primacy of the temporal nature of music is defended, in comparison with the ‘space’ metaphor that has been offered<sup>145</sup>. In this context, this study tackles the idea of a temporal continuum engendering all the parameters in music: intensity, timbre, space, pitch, pulse, and movement. Moreover, this last idea assumes already the perspective from which the temporal modes linear, circular, and branching are going to be studied, i.e. under the general and basic dimension of listening, independently of its dissection into the actions of composition, performance, or reception.

The organisation of topics inside the whole Chapter 2 suggests, firstly, the passing from a particular notion of the musical work to a more comprehensive concept of music, and secondly, the opposite movement: from time as a general frame to a conception of a particular experience, that of musical time.

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<sup>142</sup> Goehr, Lydia and Davies, Stephen, *et al.*, *Grove Music Online*, “Philosophy of Music,” IV. 1.

<sup>143</sup> Ingarden, Roman, *Ontology of the Work of Art, The Musical Work, The Picture, The Architectural Work, The Film*, 1989.

<sup>144</sup> Goehr, Lydia, *The Imaginary Museum of Musical Works*, 1992.

<sup>145</sup> Scruton, 1997, pp. 1–96.

## 2.1. From the Ontology of Musical Works to the Ontology of Music

### 2.1.1. The Ontology of the Musical Work

As stated, the ontology of the musical work was the most developed question inside the more general topic of the ontology of music. Davies summarizes some of the main trends of thought: Musical works were either conceived as a class of descriptions relative to a notational scheme—‘Nominalism’, Nelson Goodman, 1968—, or, on the contrary, as types created for determined instrumentation means, whose identity depends on socio-historical matters—‘Contextualism’ or ‘Qualified Realism’, Jerrold Levinson, 1980. They have also been conceived as ideal sound-structures discovered by composers—‘Realism’, Peter Kivy, 1993—and at the same time, presented as portrayed sound patterns—‘Aristotelism’, Kendall Walton, 1977. Works were thought of as ideas in the mind of their creator and receptor—‘Idealism’, Lascelles Abercrombie, 1922, Robin G. Collingwood, 1938 and others—, and finally, as neither real nor ideal or mental entities but as purely intentional objects —Roman Ingarden, 1928. Lately, works have been seen as cultural constructs emerging as late as 1800 —‘Historicism’, Lydia Goehr, 1992.<sup>146</sup>

To start with, and before entering into a detailed study of the main theories mentioned above, the general problems with which the ontology of the musical work usually deals with will be presented by introducing ‘Pierre Menard: Author of Don Quixote’, the story told by Jorge Luis Borges in *Ficciones*.<sup>147</sup> This will serve as a useful analogical image to show the main questions without taking into account for the moment any names or philosophical movements.

This fascinating story begins with the complaint of a critic, due to the omission of the ‘main work’ belonging to the symbolist novelist Pierre Menard, in a detailed catalogue of his production. Pierre Menard was a cryptic French writer recently deceased, a friend of the critic, whose main work had been writing in the 19<sup>th</sup> century, the ninth, the thirty-eighth, and a fragment of the twenty-secondth chapter of the classic *Quixote*. The chapters were identical word for word to the original written by Miguel de

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<sup>146</sup> Goehr, Lydia, et al., *Grove Music Online*, IV. Anglo-American philosophy of music, 1960–2000.

Goodman, Nelson, *Languages of Art*, 1968; Levinson, Jerrold, “What a Musical Work is”, *Journal of Philosophy*, 1980, pp. 5–28; Kivy, Peter, *The Fine Art of Repetition*, 1993 and *Introduction to the Philosophy of Music*, 2002; Walton, Kendall, “The Presentation and Portrayal of Sound Patterns”, 1988, pp. 237–57; Hoffman, Robert, “Conjectures and Refutations on the Ontological Status of the Work of Art”, *Mind*, 1962, pp. 512–20.

<sup>147</sup> Borges, Jorge L., *Ficciones*, 1941. For commentaries, see Oscar Tacca’s “Riqueza de *Pierre Menard*, *Autor del Quijote*”, in:

<[http://www.iacd.oas.org/Interamer/Interamerhtml/azarhtml/az\\_tacca.htm](http://www.iacd.oas.org/Interamer/Interamerhtml/azarhtml/az_tacca.htm)>

Cervantes. Borges affirms, Menard did not want to copy—it would have been very childish; he did not want it to be an actual *Quixote*, either—it would have been an anachronism; neither did he want it to be another *Quixote*—it would have been a fake: he indeed wanted to situate his characters in another time and space, giving a new sense to the historic novel. In this context, the critic considered Menard's work far superior to Cervantes', in that the resultant become more subtle and infinitely full of allusions.

Borges meditates here, as always in his works, about time and the obsession for the multiplication of repeated objects, as if it were a game of mirrors. He reflects about things that are the same—as Cervantes' *Quixote* and Menard's one—but by the work of time appear to be different.

This is not the first time that Borges is inspired by philosophical issues. In other parts of this thesis, the impact of some of his works on studies about time will be shown: here as a pioneer in literary critique, there, commenting traditional conceptions of time, even anticipating theories in contemporary physics. The present story has many allusions for literary theory and critique. In this sense, it anticipates the critical literary theory that would emerge later, the 'post-modern reader-response theory', which rejected the old view that emphasized the work itself, separating it from its reception and thus highlighted the work, treating it neutrally in merely formal terms. According to the new theory, readers make the literary event. It is not the aim here to enter into comparable theories on music analysis. 'Pierre Menard' will serve in this occasion instead as an illustration for extracting the main questions on the ontology of the musical work.

Roger Scruton<sup>148</sup> mentions also Pierre Menard's story for illustrating the particular case in which a composer departs so far from a work that creates not a version of it but a new work, as happens in the example mentioned of Anton Webern's orchestration of the six-part 'Ricercar' from Bach's *Musical Offering*. Here the author composes anew the same work from the modern sensibility of a serial composer, arriving at the very same notes that Bach had found. This puzzling case raises the ontological question of the work's identity: What are the conditions for A and B appearing in different moments of time to be the same work? The other, the same: a problem that keeps awake philosophers and which especially intrigued Borges too, now in musical version.

Notwithstanding, 'Pierre Menard' is the source for even a broader landscape of allusions than that noted by Scruton, about what kind of identity is claimed by a musical work: numerical, or another kind? What is the limit between a work's arrangement (version) and a new work (variation)? The ontology of musical works asks about the

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<sup>148</sup> Scruton, 1997, pp. 99–100.



‘place’ where the work is: is it a mental subjective experience, can it be situated in the sole mind? Or is it an intentional object, neither real nor ideal, which supposes at the same time certain fisio-psychical activity in the creator, a material support and a community of receptors? Is the work present in its performances or better, a sound pattern extracted from concrete performances or interpretations? Is it defined by its score, or, on the contrary, do timbrical and cultural–temporal factors carry a greater part of its meaning? And about its coming into existence: Is it disclosed by an act of reminiscence or is it created or formed *ex nihilo*? The main theories written for trying to answer these issues follow.

Roman Ingarden (1893–1970) appears as one of the first names in the movement of investigations into ontology concerning music. Unfortunately, he was almost forgotten by the community of scholars; lately his work has been rediscovered. Ingarden wrote the original version of *The Work of Music and the Problem of Its Identity* in Polish in 1928–1933, after his famous *The Literary Work of Art* (1931), his main work on aesthetics, and as an extension to it. The present analysis of his work is however based on the revisited version *Ontology of the Work of Art, The Musical Work, The Picture, The Architectural Work, The Film*.<sup>149</sup>

In order to understand the scope of the author's writings, a brief introduction to his more general philosophical ideas is necessary.<sup>150</sup> Roman Ingarden was a phenomenologist, ontologist, and aesthetician, whose main interest was to develop an alternative, moderate position between positivism and the transcendental idealism defended by his teacher, Edmund Husserl. Ingarden was a realist phenomenologist, in the sense that he agreed with the first period of Husserl's thought known as descriptive phenomenology, that of the *Logical Investigations*, 1900–1901, but disagreed with the writer's later *Ideas*, 1913.

In phenomenology, the notion of ‘intentionality’ is of great importance, since it describes the situation by which our mental acts are directed towards objects. Transcendental phenomenology, in turn, believes that what we know is not the object as it is in itself but the object as it is given in the intentional act. In order to acquire the essence of the object we have to practice the ‘epoché’, putting in brackets all our assumptions about the external world. The consequence of the application of such

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<sup>149</sup> First version in German in 1962.

<sup>150</sup> For an introduction to Ingarden's life and work, see: Thomasson, Amie, “Roman Ingarden,” *The Stanford Encyclopedia of Philosophy*; ‘Ingarden’, *Diccionario de Filosofía Ferrater Mora*, 1994, pp. 1841–1843, E–J.

method is the sole transcendental ego as residual. Transcendental phenomenology deals with essential structures in the pure consciousness.

The work of Ingarden was born precisely from the rejection of this later position. Realistic phenomenology, the position he defended inside phenomenology, studies the structure of consciousness and intentionality, assuming the existence of the external world independent of that consciousness, and it is interested in the search of the universal essences of various matters involving human action. According to Guido Küng:

Ingarden was of the opinion that an analysis and evaluation of the constitutive processes involved in our knowledge of things presupposed as a 'guiding thread' the prior possession of a clarified notion of those things, while Husserl maintained that a clarified notion of the things could only be obtained on the basis of a prior understanding of the process of constitution.<sup>151</sup>

As mentioned, Ingarden was an ontologist. But here one has to differentiate what 'ontology' and 'metaphysics' meant for him as a particular definition, derived from the traditional sense mentioned in the first paragraphs of this chapter. 'Ontology' deals with objects that not necessarily imply existence, being only subject of possible judgements. Ontology for Ingarden is then concerned with what possibly exists, while 'metaphysics' is dedicated to what factually exists.

In his *The Controversy over the Existence of the World* (1947–1948) he pursued a solution for the debate between realism and idealism. He preferred to move away from the epistemological question about whether to be known, the real world depends on our consciousness or not, which was circularly undecided. He soon realised, the world could not be thought of without a consciousness, but consciousness could not absorb all the weight of existence of the outside world, therefore the 'controversy'. Instead, he proposed an ontological analysis of the possible ways the world and consciousness could interact. *The Controversy* is incomplete, however a portion of it led to important results.

Thus, previous to the metaphysical question whether the real world exists or not, is the ontological question about the sense of the expression 'the real world'.<sup>152</sup> To this follows a study of the different beings: absolute, real, intentional, and ideal. He wanted to show that neither realism nor idealism were adequate and found a point of departure precisely in the objects of art, with its ontic foundation in something real—copies of texts, scores, canvas—but with its source in the consciousness of their creators. He

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<sup>151</sup> Küng, Guido: <http://www.formalontology.it/ingardenr.htm>; in <http://www.ontology.co/>

<sup>152</sup> Id.

demonstrated why the traditional categories of the real and the ideal were not anymore sufficient for classifying all objects.

Ingarden reached the study of the different modes of being through a detailed analysis on dependence and temporality. Regarding the first issue, he observed four pairs of dependency: 1) autonomous–heteronomous, 2) original–derivative, 3) separate–not separate, 4) absolute–contingent. Concerning temporality, Ingarden distinguishes various aspects of concrete time or modes of existence of the temporal objects: processes, events, and objects enduring or persisting in time. Processes are defined as belonging to objects that begin at a certain moment, occur for a time, and finally conclude, such as a performance, a footrace, a war, the development of an organism, or the life of a man. Events are defined as ‘the coming into being of a state of affairs’.<sup>153</sup> Finally, there are objects that persist in time, such as a material thing, a living creature, or even a work of art.

From these distinctions on different modes of dependence combined with temporal modes, he distinguished four different ‘modes of being’: Absolute—atemporal, God; Ideal—timeless, objects such as numbers conceived in a Platonistic way; Real—spatio-temporal, entities such as real objects; and Purely Intentional—supratemporal or quasi-temporal, seemingly in time, entities which owe their existence to acts of consciousness such as fictional characters, having their ontic source in something real.<sup>154</sup>

Ingarden explores in *Ontology* (1989) the question about what a musical work is.<sup>155</sup> He rejects the notion that works exist in a physical or material way, or as part of the composer’s mental life and that they can be ideal objects. He demonstrates that musical works are neither their performances, nor their scores. He concludes that musical works exist as heteronomous objects, in that they depend for their existence of acts of composers and listeners. In addition, they are intentional objects, unlike real objects that have only material presence or psychical ones; they live in an intermediate zone. As a consequence, the work of art has a double nature: a constitutive aspect—that of the creator—and a sustaining aspect or material foundation. Moreover, musical works constitute the ‘ideal boundary’, in the sense of an ‘optimal boundary’ towards the real performances of the work fall.

The work of art is a ‘schematic formation’, which needs what he calls a ‘concretization’ to become an ‘aesthetic object’. As such, it has its ‘places of

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<sup>153</sup> This notion of ‘event’ is different from the one is going to be adopted later in this thesis belonging to a relational conception of time.

<sup>154</sup> See Küng.

<sup>155</sup> Gierulanka, Danuta, “Ingarden’s Philosophical Work: A Systematic Outline” and Anita Szczepanska, “The Structure of Art Works,” in *On the Aesthetics of Roman Ingarden*, 1989, pp. 1–54.

indeterminacy' that will be filled by an act of interpretation. In music, timbral aspects, articulation, dynamics, are examples of variable places a performance fills out. However, it is common to erase this distinction by identifying the work with a particular concretization. Ingarden defends the idea that the structure of the work has to be investigated. Concretization has relations with the cultural atmosphere of the period.

Ingarden differentiates between 'artistic' and 'aesthetic' values. Artistic values are those which belong to the schematic formation of the work and are axiologically neutral, for example, monodic or polyphonic texture. Aesthetic values belong to the concretion of the work and appear jointly with an 'aesthetic attitude', i.e. clarity, profundity, etc. It is a fact also that many aesthetic objects can have their origin in the same work of art, artistic values differing in their aesthetic values.

As a consequence of the above mentioned division, the author solves the problem of the objectivity of aesthetic values, ending with the subjectivist thesis associated with works of art, as having their values tied with the receptor's pleasure or displeasure. Objectivity has its foundation in the scheme of the work, qualitative and structural features, i.e. artistic values. This also makes evident Ingarden's core position, by which he wants to distinguish the role of subjectivism and consciousness from that of the independent real world.

In this context, the controversy between realism and idealism can be recast as whether the real world has the real or purely intentional mode of being: Ingarden concludes that it is impossible to reduce our world to a purely intentional creation. Having his interest in aesthetic issues, he dedicated a great part of his work to these objects, which provided him the optimum place for thinking about the realism/idealism controversy.

Regarding the topic of aesthetic values, it was at first considered by Ingarden to be out of the focus of his aesthetic works, which were mainly developed as ontologies of art in connection with the fundamental philosophical problems of the magnitude presented in the paragraphs above. In this sense, ontology proved indispensable going into further investigations on values. This latter investigation was carried out after in *The Cognition of the Literary Work of Art* (1937).

The result of his detailed and rigorous thought anticipates the posterior philosophy of music of analytic inspiration, tendencies described under the general views of 'Nominalism', 'Idealism', 'Platonism' in music ontology.<sup>156</sup> Ingarden has in common with this tradition the prosecution of a conceptual analysis, although his view is non-

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<sup>156</sup> This categorization belongs to Goehr, 1992.

analytical. In the most recent studies, defenders of works of music as cultural entities, not centred in philosophical analysis, proposed a further step from this way of thinking of the problem of the ontological status of the work, namely, the historical approach presented by Goehr. For the moment, the arguments of this analytic tradition follow step by step Ingarden's own theses. Sometimes these philosophers enriched his thoughts, sometimes they relapsed into many of the problems already brought up by Ingarden.

The following subpoints reproduce the main arguments on the ontology of the musical work, introduce critical material, and prepare the discussion to move on to an ontology of music.

### *The Musical Work and the Performance*

The point of departure is the distinction of the work from the performance of it.<sup>157</sup>

Each performance of a musical work is an individual process and therefore also a temporal object, which is clearly situated in intersubjective concrete time and it is unrepeatable. Works, on the contrary, are not processes, but things persisting in time once brought into existence. For this last situation, it is impossible for a work to be an ideal object. However, it is not a real object; the musical work is a quasi-temporal structure: Its parts exist simultaneously but display a definite order of succession.

Each performance of a musical work, according to Ingarden, is above all an acoustic process, which is causally determined by a real process activated by the performer. Musical works instead, are not necessarily dependent on real acoustic processes for its creation or continued existence.

Each performance is both objectively and phenomenally located in space. In contrast, a piece of music possesses no defined spatial localisation. Note that the aspect of space in music, as debated in contemporary music, is in Ingarden's view forgotten. Dimensions of space, high–low, deep–surface, would be situated already in the dimension of the work's constitution, despite its metaphorical sense, and not only in relation to performance.

Each performance of a musical work is given to us via hearing. The acoustic processes are given to us as aspects or appearances, and they are different for two different subjects and from different locations in space. On the contrary, the musical work does not manifest itself in the changeable auditory aspects experienced by the listener.

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<sup>157</sup> Ingarden, 1989, pp. 7–15.

Individual performances of the same musical work by several interpreters, or even by the same interpreter, normally differ. Each musical work however is always a unique entity. From this base precisely, we can speak about performances more or less faithful to the work.

Each separate performance is as an individual object completely and univocally determined. This is not true about the work, which is always capable of further determinations.

Ingarden's analysis of the performances and its distinction from the musical work is in trouble with those studies that give emphasis to the performance, being the concretization through which one can appreciate the musical work. From this perspective, the musical work would seem to have no existence separated from its instances. In a critical study of a Polish scholar published in a further revision of Ingarden's work,<sup>158</sup> there is indeed a deep questioning of the separation between work and performance as it is found in the *Ontology*.

According to Andrzej Pytlak, there is indeed a deep questioning of the separation between work and performance as it is found in the *Ontology*. Firstly, performances are not *subsequent in time* to the work in music, if we considered the case of an improvised composition. Statements about what a performance is—process, acoustic-real, spatial, singular, polysemic, and closed—are true first in comparison to those related to the musical work.

Secondly, again according to Pytlak, there is no *severance* between the work and its performances. The determination of instrumentation for example brings the work closer to the performance. The case of electronic music, for example,<sup>159</sup> tests at the extreme that there are common features between a musical composition and its performance. Then, if works and performances are similar, it should be possible to reduce the similarities to a formally identical shape. If one considered the case of an *accomplished performance*, we could ascribe to it features that Ingarden reserved for musical works: Free localization in space, a quasi-temporal structure, non-sonic features, simultaneity, the fact of ceasing to be a process or being an univoque object persisting in time.

The reflection made by Pytlak somewhat anticipates what Lydia Goehr thought about Ingarden's idea of the musical work. As one goes out from the usual ways of producing music ('works'), as in the case of the avant-garde music but also thinking of the antique, jazz and popular music based on improvisation skills, the theory becomes

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<sup>158</sup> Pytlak, Andrzej, "On Ingarden's Conception of the Musical Composition," in Dziemidock-McCormick, *On the Aesthetics of Roman Ingarden*, 1989, pp. 233–254.

<sup>159</sup> Recorded concrete, electronic, or mixed music, considering manipulation in real time.

more problematic. There, concepts such as ‘work’ and ‘performance’ begin to be dismantled or are simply problematic. This means that Ingarden’s notion of work is restricted to a portion of music, an historically situated way of conceiving music. Another omission comes from forgotten points of view, of the interpreter and the listener.

In order to amplify these thoughts introduced by Ingarden, the so-called Aristotelian view<sup>160</sup> of musical ontology embraces the idea that works are essences or sound structures inherent to their sensible scores or performances. Kendall Walton<sup>161</sup> identifies the work with the sound pattern belonging to each performance. According to this author, the work is not a particular object or event, a substantial thing, but a structured and instrumental pattern of sounds plus other contextual specifications that performances can fulfill or fail to fulfill.

We can identify the piece with the complex consisting of the set of sound patterns and whatever circumstances (such as the date of composition or the culture in which it was composed) go into determining how its performances are to be heard.<sup>162</sup>

Walton points out that the question of what is primary, works or performances, is rooted in our cultural tradition. Some of the patterns that constitute the piece are not pure sound patterns, but rather patterns such that to fit them, a sound event must have been produced in a certain manner, in addition to possessing certain acoustic properties. That is why musical works are not to be identified with any patterns or sets of patterns. This set is best understood as only one component of the work.

From the analyses of critical work (Pytlak, Walton) following Ingarden’s treatment of the work in relation to its performances, the conclusion is that the separation of one from the other is at least problematic, not only in cases inside the history of music which do not exhibit such clear demarcation, but more importantly because concretizing aspects of performances help to present and portray, i.e. provide access to the work of music conceived as sound pattern.

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<sup>160</sup> Term ascribed by Goehr, 1992, pp. 15–16, in reference to Walton, 1977/1988. The topic about the historically conditioned concept of the ‘musical work’ was tackled by Goehr in 1992, but Walton posed it already in 1977.

<sup>161</sup> Walton, 1988.

<sup>162</sup> *Ibid.*, p. 257.

*The Musical Work as a Mental Object*

A next step towards Ingarden's own definition of what a musical work is concerns the study of the relationship between the work and mental experiences.<sup>163</sup> The question here is: Is the musical work equivalent to a certain multiplicity of mental experiences? In other words, is the musical work an idea in the mind of the composer/listener? In summary, is it something exclusively subjective?

According to this idealist view, what exist are complexes of mental experiences that are similar to one another, because of the qualitatively identical objective processes or sound waves. In this context, however, the identification of one work by several experiences becomes a difficulty.

If subjective means that which does not exist in an ontically autonomous manner, then musical works are subjective; but according to Ingarden, this is an erroneous point of view. These ideas are objectified in scores or performances, but works are not identified with the latter but with the ideas themselves. The argument against this idealist view consists of denying that the work is something private that cannot be shared by a community of receptors.

We would also have to deny, thinks Ingarden, that they are experiences or parts of experiences. For precisely the experiences of consciousness and the real parts of them are ontically autonomous and are thus not subjective in the sense expressed above. On the other hand, musical works are not experiences or parts of experiences since they are not accessible to immediate cognition merely by acts of reflection (a hearing, a feeling, etc).

In this line of arguments, Ingarden recognises that the idea that works are rather the 'content' of psychical experiences of the composer/listener is tempting. 'Content' however designates a real part of an experience of consciousness. In music, the acoustic sensory data constitutes the real part of experience; but the tones and tone formations are different from the acoustic information we experience in listening. Tones are 'transcendent' to the perceptual experience of consciousness. This is because the act of perception contains an intention, which is directed to what is heard.

Those which are already past no longer exist, and form *eo ipso* no real part of the present instant's phase of the hearing of the tone. But in spite of that, the perceived tone remains one and the same and is perceived as such in its whole duration [...].<sup>164</sup>

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<sup>163</sup> Ingarden, 1989, pp. 16–22.

<sup>164</sup> *Ibid.*, p. 20.



*A fortiori*, no tone formation of a higher degree, for example, a melody of an individual performance of a musical composition, is a “content” of any experience, any process of consciousness. In the correspondent act of perception there is contained a special intention—which we call the non-intuitive content of the act—which is directed to the heard melody.<sup>165</sup>

Ingarden addresses that the musical work is still transcendent in a higher degree than performances. For just that reason musical compositions are nothing mental and nothing 'subjective' but objectivities of a special kind, of course dependent on a composer who created them, performers who interpret and listeners who apprehend them.

The hypothesis of the musical work as a mental experience is ambiguous and false. If they are subjective in the first sense of being not ontically autonomous, this is incompatible with the second sense of being mental experiences ontically autonomous. And even if they were the ‘content’ of a mental experience, they would have to constitute a real part, where the crucial intentional—non-intuitive—side of the work is excluded.

As stated, this idealist view thinks of the relation between musical works and mental experiences as the mental experience of a composer. However, the mental experience of a composer does not cover the whole reality of a musical work: a work persists beyond its creator, and there are more things than those imagined by the composer, as reality demonstrates. Instead, one could say there is a community of creators around the work, without necessarily being worthy compared to the figure of the composer.

Robert Hoffman also refutes the idealist view<sup>166</sup> in the audience, according to which, the work were the succession of experiences—sensations, images, feelings and ideas—that he/she has in contact with the work. Hoffman’s counter thesis is that works of art are not private but belong to a community of spectators. Otherwise, a person having the same experience, when in contact with two different works of art, would lead us to think about one work of art, which is unsound.

Hoffman refutes also the notion that the work is in the mind of its creator. If the work is the image in the mind of the artist who created it, the work would be exclusively an experience of the artist, impossible to share. On the other hand, one would have to know what the artist’s experience is. But on principle, we can never know what the experience of the artist is, hence, we can never know if we are experiencing the same work.

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<sup>165</sup> *Ibid.*, p. 21.

<sup>166</sup> Hoffman, 1962.

Hoffman leaves it to Wittgenstein to explain that, in the context of music, if there were no public aesthetic object there would be no ‘independent criterion’ for testing something as a work of art. It seems that the identification of a musical work with mental images or subjective experiences is a false path to take, as Ingarden firstly refuted and Hoffman amply maintained.

### *The Musical Work and the Score*

Ingarden analyses also the identification of the musical work with the score.<sup>167</sup> This belief, is maintained by those who think according to the principle ‘entities are not to be multiplied beyond necessity’ and consequently explain everything in a positivist sense, by material things.

Ingarden thinks that no material thing is capable of having a non-material function, which is a symbolic function. And the score serves as the basis for an intentional function, the function of meaning. The identification ‘musical work-score’ would not free us for postulating non-material objects.

Because not every musical work is written down, and the score is a system of imperative symbols:

To provide intentional access to an objectivity is not the same thing as to be this objectivity itself. As every symbol (sign) is distinct from the symbolised (signified) object, so also is the score distinct from the work defined by it.<sup>168</sup>

Ingarden introduces the comparison between literature and music.

[...] In contrast with the linguistic entities, consisting on logemes and their meanings, which do enter into the stock of the literary work that is read aloud [t]he score does not constitute a stratum of the musical work; it remains entirely extraneous to it.<sup>169</sup>

This quotation underscores the falsity of the identification of a musical work with the score. Forty years after, Nelson Goodman would develop a somewhat contrary statement from his nominalist interpretation of the musical work. In this view, works are linguistic items that serve conveniently to refer to determined classes of particulars. This view ended up reducing works to their scores.

Nominalism as a philosophical school believes that universals are not existent entities, but language terms (*flatus vocis*). Universals are not *ante rem* (as Platonists

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<sup>167</sup> Ingarden, 1989, pp. 23–26.

<sup>168</sup> Ibid., p. 26.

<sup>169</sup> Id.

believe) neither *in re* (as Aristotelians). But they are *nomina, voces* or *termini*.<sup>170</sup> Only individuals and particular entities have real existence. Goehr explains clearly referring to nominalism in music ontology:

Here, one moves away from considering the vertical relation between a work and its performances, a relation obtaining between an abstractum and its concreta. One considers, instead, the horizontal relation obtaining between performances and score-copies.<sup>171</sup>

For Goodman works are identified with the classes of performances that are perfectly compliant with their scores. Notwithstanding classes are abstract entities, Goodman considers his theory to be substantially nominalist.

In *Languages of Art*, Goodman presents an extensionalist theory of symbols, with musical works being part of it as symbol systems among others in the arts. Music is an allographic art, art instantiated in performances,<sup>172</sup> as can be said of theatre or dance. This, in opposition to autographic arts, where one is interested in distinguishing between the original and the forged, as in painting or sculpture. In this way, notation serves to transcend time and the individual, and is described by Goodman as central for those transitory works. According to the author, notation is sufficient for explaining the identity of a musical work;<sup>173</sup> meanwhile non-notational features are irrelevant. Musical works are the class of performances compliant with a score, hence the primary function of scores for identifying a musical work.

A score is a character written in a notational system. A notational system consists of characters correlated with a field of reference like any other language. A character is a class of inscriptions (marks or utterances). Thus, the musical system or 'language' in general consists of scores correlated with classes of performances. For each work there is a single score correlated with a single class of performances. The relation of correlation is called 'compliance':<sup>174</sup> a one-directional semantic relation binding performances to scores.

A notational language consists of atomic characters which in their modes of combination form compound characters of greater and lesser complexity; i.e. pitches are atomic characters, and compound characters are governed by harmonic, rhythmic rules of combination, among others. Goodman presents five syntactic<sup>175</sup> and semantic<sup>176</sup>

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<sup>170</sup> *Diccionario de Filosofía Ferrater Mora*, p. 2575, K–P.

<sup>171</sup> Goehr, 1992, p. 17.

<sup>172</sup> Goodman, 1968, p. 112.

<sup>173</sup> *Ibid.*, p. 127.

<sup>174</sup> *Ibid.*, p. 143.

<sup>175</sup> *Ibid.*, p. 130.

requirements for a language to be notational, which forbid ambiguity, overlap, and indeterminacy among characters and its compliances: i) Syntactic disjointness—character indifference, ii) Syntactic differentiation, iii) Unique determination, iv) Semantic disjointness, and v) Semantic differentiation.

As a consequence of these requirements, Goodman proposes a ‘retrievability test’: given a score-copy it is possible to identify the work—which means the performances. At the same time, it is possible from a performance to recreate a score.

*Syntactic requirements:*

1) Given two different inscriptions they cannot belong to the same character (syntactic disjointness). All inscriptions of a same character must be syntactically equivalent (character-indifference). 2) The characters must be finitely differentiated. Given an inscription ‘i’, it must be theoretically possible to determine whether it belongs to characters K or K’. In contrast, syntactical density would imply that given two characters, there is an inscription between them and it is impossible to determine exactly to what character it belongs.

*Semantic requirements:*

1) Each character must have a fixed correlation in the reference field (unambiguity or unique determination). 2) Compliance classes must be disjoint, they do not have to intersect in extension (semantic disjointness). A closer situation is that of two terms denoting practically the same (redundancy). Nonetheless, it is less problematic, because although redundancy does not imply the preservation of the notation, it implies the preservation of the work, which is the main aim of a score.<sup>177</sup> 3) For every two characters K and K’ such that their compliance-classes are not identical, and every object ‘o’ that does not comply with both, determination either that ‘o’ does not comply with K or that ‘o’ does not comply with K’ must be theoretically possible (semantic differentiation).<sup>178</sup> In contrast, a system is semantically dense when given two characters there is compliance, being impossible to say to what field of reference it belongs.

According to Goodman, the characteristics described above define notational systems; these systems can be from now on clearly distinguished from non-notational, such as discursive (that respect only syntactic requirements) or pictorial (that do not respect any one of the requirements above mentioned). We are going to emphasise scores as notational systems, considering only the case of the current common musical

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<sup>176</sup> Ibid., p. 148.

<sup>177</sup> Ibid., p. 178.

<sup>178</sup> Ibid., p. 152.

notation. Other notational systems such as graphical notational systems deny the syntactic requirement of finite differentiation.

In current common musical notation, a note-inscription match with one character (for example the note *do* in the staff, with 'C') and as it is equivalent with those of the same class, it can be substituted.<sup>179</sup> So here we have the first syntactic requirement. It is also possible to determine that given a note-inscription (i.e. *do*), either it belongs to one or another character (i.e. to 'C' or 'D'), thus fulfilling the second syntactical requirement.

Regarding semantic requisites, a counter-example would seem to be found if we think of the case of enharmonic sounds such as for example c-sharp and d-flat in equal temperament; here several characters denote the same sound-events becoming redundant. But as redundancy is interpreted as not problematic, the requisite of semantic disjointness can be considered to be fulfilled. Concerning the last semantic requisite of differentiation,<sup>180</sup> the argument is that we could think about series of whole notes, half-notes, quarter-notes, eighth-notes, *ad infinitum*. Here, there must be a fixed number of flags for the recovery of the score from the performance to be theoretically possible and as tradition has set it, then the question is solved.

Regarding numerical and alphabetical characters (those related with indications of *tempo*) that appear in a score, they do not fulfill the above-mentioned requirements. Consider terms like 'presto', 'allegro vivace', 'allegro assai', 'allegro spiritoso', 'allegro molto', 'allegro ma non troppo', 'allegro moderato', or 'poco allegretto'. Here, if unambiguity were preserved, semantic disjointness and differentiation would not be maintained. We would not be able to avoid intersection neither could we clearly differentiate between two of the compliants. A solution to this for Goodman is that they are not indications considered as integral for the identification of the work to become possible. The same could be said about dynamic or timbre markings.

An implication of meeting the perfect compliance condition is that any performance, however boring, satisfies the notational prescription so long as it does not have mistakes. Contrarily, the most brilliant performance, if it has one mistake, does not count as a performance of the work. And still, by what criterion could one decide, with reference to a score, how many mistakes would be admissible in a performance of a work?

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<sup>179</sup> Ibid., p. 181.

<sup>180</sup> Ibid., p. 182.

One could say that if the identity of the more complex parts is retained, we can admit mistakes in individual notes; so long as we recognise the melody-gestalt, i.e. it does not matter if one or two notes are incorrect. Goehr noticed problems however here: recognising *gestalten* usually does not fit extensional descriptions. To instantiate a melody, we must instantiate each atomic part.

Still, would Goodman's theory be affected, were we to stipulate that compliance be at least, eighty percent? But why we would choose this number and not another is not obvious. Goodman wanted to avoid vagueness. Someone inclined to Platonism could argue that it is the work that has a fixed, unalterable set of properties, whereas performances are only imperfect approximations or copies.

According to Goehr, Goodman cannot recognise intentional and recognitional conditions and straightforwardly preserve his extensionalist commitments. He has a difficult choice between two propositions that are equally strange: There is a degree of vagueness both in the work and its performances, or they are equally and perfectly determinate as regards their constitutive properties. He opts for the latter.

To conclude, the nominalist view identifying completely the work and the score would fail. Under nominalism, there would be important aspects which relate to the expressive connotations of a work that could not be explained. Furthermore, not every work is written, but most important, only one mistake would result in a new work, while it is rare that this is the way things happen in musical practice.

### *The Musical Work as a Non-Real Object*

Ingarden proceeds to give an analysis of the essential structure of the musical work. At this moment, he provides the arguments to demonstrate that the work is not a real object.<sup>181</sup>

The work could be distinguished from other acoustic signals because of: 1) a special ordering; 2) the appearance of new factors— either 'acoustic', such as melody or 'non-acoustic', such as the expression of feelings; 3) something specific, which certainly distinguishes music from other acoustic phenomena.

Regarding the first option, it appears that there are certain moments in which musical formations and other formations coincide, as for example it can happen with the Siegfried motif used as the sound of a car horn. As a consequence, it may happen that there is no special ordering that music has from which it can be differentiated from

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<sup>181</sup> Ingarden, 1989, pp. 27–46.

other acoustic formations. The ordering alone is not sufficient then for distinguishing music from what is not.

About the second option, it is tempting to argue that music distinguishes itself from other formations primarily because of its acoustic factors, in that it has melody, rhythm, and harmony. However, there can be music without melody, or that acoustic formations of different nature have melody without being music at all. So, again, this would not delimit what is music and what is not. Second, one could say that music is defined by non-acoustic factors, in that it expresses feelings or mental experiences or in that it portrays other things. However, Ingarden considers ‘absolute’ music, which is not guided by a program, does not express, and does not go beyond the tones themselves, as music too.

Finally, Ingarden realises that it is still evident some difference between those acoustic objectivities in nature and the work of music. Natural acoustic phenomena and artificial acoustic signals form a real event in the natural real world. However, musical works as objects of aesthetic appreciation refer to no other real facts. Moreover, they are no real events and no real objects, since they are not causally joined with any real process or fact.<sup>182</sup> However, every performance is real. It was established before, that contrary to what happen with the performance we could not apply the categories of *hic et nunc* to the musical work.

What is it supposed to mean, for example, that Beethoven’s sonata, opus 13, is “here”? Where is “here”? In this room, or in the piano, or in the section of space over the piano? And if the sonata is performed at the same time in ten different cities, is one and the same sonata then supposed to be in ten different places?<sup>183</sup>

According to Ingarden, the musical work is not an individual. Rather, what we apprehend with the commerce with it are pure qualities, not individualised by the particular mode of existence of real beings. And it is not an individual because it does not exist in any time and in any space. If it deserved to be called ‘individuality’ would be because of the unique, unrepeatable harmony between the pure qualities of the tone formations.

In the reciprocal qualitative modification of the tone formations occurring together or following in sequence, and in the final quality of wholeness, unique in its kind, that results from this reciprocal qualitative modification, lay the sole basis of the individuality of a musical work. But this individuality is essentially different from the “individuality” of real objects, which follows from

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<sup>182</sup> These arguments give the key for understanding later Scruton’s theory on sound and tone.

<sup>183</sup> Ingarden, 1989, p. 36.

the mode of being of real beings, from the individuating concretization of ideal qualities in many real objectivities.<sup>184</sup>

Precisely because of this qualitative individualisation contrasting with that proper of every *hic et nunc* real object, musical works are *supraindividual* entities. And with respect to their content, they are also *supratemporal* objects. This is the nucleus of the most important part of Ingarden's thoughts about musical works, which influences the present understanding of the primacy of temporality in defining music in general.

However, before entering into the analysis of supratemporality, it is illustrative to show that the thesis about musical works as non real objects, understanding realism in the sense of the traditional philosophical view, is an anticipated critique to what later was called the extreme Platonist view in music ontology. Ingarden prevents from a wrong interpretation of the 'supraindividuality' of the musical work, explaining it in terms of an ideal object. He answers that musical works require the creative activity of their composers, and creative activities are different from cognitive, in that they do not disclose or uncover their objects.

#### *The Platonist View: Qualified Platonism*

In 'What a Musical Work is',<sup>185</sup> Jerrold Levinson argues against Nominalism. Musical works exist apart from their performances and the identity and individuation of performances involves intentional and recognitional components. Moreover, according to this view, our pre-critical intuitions lead us to say, that the Bartók String Quartet itself, and not the class of its performances, is delightful. It seems then that works, on the other hand, once created, are permanent and independent of their performance.

Levinson does not simply identify musical works with patterns or sound structures in scores and performances. Rather, works: i) do not exist before the composer's creative activity and are 'necessarily personalised', ii) and are such that composers in different musico-historical contexts, who determine identical sound structures, invariably compose different works.<sup>186</sup> That is because the composer represents a particular time and place, and this cannot be exhibited by the sound structure alone. Auditory and relational properties such as 'being classical', 'being revolutionary', 'being

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<sup>184</sup> Ibid., p. 37.

<sup>185</sup> Levinson, 1980.

<sup>186</sup> The relation of this item with Borges's Pierre Menard story at the beginning of this chapter is remarkable. However, as it will be explained in the following paragraphs, Levinson pinpoints here rather than the musical equivalent to a reader-response theory, a conservative view about the interpretation of musical works.



Liszt-influenced' determine the aesthetic character of the work. iii) Works, finally, are such that means of performance, i.e. instrumentation, are an integral part of them. It is not true that composers of the last centuries have been composing 'pure' sound structures.

Musical works are 'initiated types' derived from 'implicit types'. They are also described as constructions derived from structures. A musical work is a "sound/performing-means structure as indicated by X at t, where X is a particular person—the composer—and t, the time of composition".<sup>187</sup>

As pointed out by the critical reading of these theories by Goehr<sup>188</sup>, this extended account of Levinson's thought, allows the definition of works both as individual creation as well as social entities, composed from a public musical language. We can refer to individual style, the style of a whole opus, the style of a genre or of a period. But his ontological position can be maintained without serious problems only up to this point.

Levinson places musical works in a new ontological category of initiated types, unusual for the tradition. His idea is that musical works are ontologically universal, but because of their aesthetic character, historically bounded. Goehr asks: i) "is Levinson constructing an ontological category just to match his description of musical works, or does he have independent reasons for so constructing it? ii) Does he treat aesthetic issues satisfactorily whether or not they bear on ontological issues? [And], iii) to what extent is he justified in taking aesthetic considerations seriously while he deals with issues of identity?"<sup>189</sup>

i) Levinson must face here the age-old problem of the source of ontological knowledge: do ontological categories come from aprioristic ways of derivation or are they empirically constructed? In the first case, one goes through a wide range conditions in search for their match in the phenomena; in the second, one begins with the phenomena themselves and seeks for the ontological categories required for their account.

According to Goehr, Levinson posits a category of objects unfamiliar in traditional metaphysical frameworks, to account for what he sees in pre-ontological terms to be essential to the phenomena in question. He appeals to the original context of production—individual and social—to partially account for the work's identity. The context, explains the determinate and fixed aesthetic character. Ultimately, this is consistent with his essentialist or objectivist view of the meaning of music and art,

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<sup>187</sup> Levinson, 1980, p. 20.

<sup>188</sup> Goehr, 1992, pp. 44–45.

<sup>189</sup> *Ibid.*, pp. 51–52.

incompatible with that of a work as a potential source of meaning in the spirit of Hans-George Gadamer, or Roland Barthes.<sup>190</sup>

ii) Levinson's pre-critical claims about musical works are pre-critical relative only to ontological theory, but not to the aesthetic theory. "Works of art truly have those attributes that they appear to have when correctly perceived or regarded."<sup>191</sup> Goehr opportunely asks however what 'something's truly having attributes' really means.

iii) Levinson could distinguish two points: 1) a work is identified partially by its musico-historical context, and 2) a work has a particular aesthetic property—let us say 'being influenced by Brahms'. One might distinguish essential aesthetic properties from essential ontological ones. Then one might identify a link between them saying that due to the identification of the work through its musico-historical context, the work has essential aesthetic properties provided by that context. Levinson, according to Goehr, leaves the connection unexplained. Goodman's solution was to separate quality issues from ontological ones. In this sense Levinson appears to Goehr to be more respectful than Goodman of our pre-ontological and aesthetic understanding of musical works.

There is a fundamental conflict in the analytic account, as Goehr explains: some theorists try to avoid pre-ontological and/or aesthetic knowledge where convenient, others try to accommodate it. There is a serious lack of agreement as to what count as relevant for something's identity.

It is true that philosophizing has been connected with the provision of definitions. And referring to the history of music, it seems that the pursuit of conceptualization comes from a need to convince the establishment that certain musical practices are among respectable and civilized activities. However, the analytic tradition seeks conceptualization for other reasons. Its search is imbued by the positivistic standards of objectivity and logic. This was a way of legitimising aesthetics, fighting against the idea that this was a meaningless activity, as it was not 'empirically verifiable' according to a particular positivistic reading.

One virtue of analytic theories is that they provide clear, unambiguous answers to questions in cases where no answers are given by the practice itself or by our pre-critical intuitions about that practice. Perhaps there are good reasons why certain kinds

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<sup>190</sup> See Goehr, 1992, p. 59. Levinson strengthened his arguments for the essentiality of instrumentation signalling that there is a connection between each instrument and an aesthetic quality. The practice of performing works on so-called period instruments follows the spirit of Levinson's theory.

<sup>191</sup> Levinson, 1980, p. 11, n 15. See Goehr, 1992, p. 53.

of practice provide indeterminate answers to certain kinds of questions. Perhaps the analytic view asks too much of a practice that is indeterminate and complex.<sup>192</sup>

Goehr goes in defence of a post-analytic ontology here, as will be analysed at the end of this section.

### *Extreme Platonism*

In his *Introduction to the Philosophy of Music*, chapter 11, Peter Kivy reflects on the ontology of the musical work. Kivy introduces the topic from the analysis of ordinary language: Why do we not react against the idea that a painting can be stolen, but we do so when a musical work is said to be stolen? He answers that because we are dealing with a physical object in the first case, able to be stolen, damaged, destroyed, or even replaced by a fake; all of these are hard to accept when regarding musical works. He proposes the cases of the score and the performance as two things that seem to occupy space and time at a first glance. And continues, declaring that although notation is not the common device that all periods have been using, we could depart from a safe moment in the history of music, such as the Fifth Symphony of Beethoven, to begin the discussion.

Kivy reads his proposal through Goodman's ideas: The performance as the compliant of a score; the work as the class of performances, the class of all performances, past, present, and to come. This appears to be sufficient to solve the defence of music as a performing art, initially deduced by the impossibility for a work of music to be stolen.

There are, however, more important things we want to preserve, according to Kivy, and that cannot be solved by these means. 1) The explanation of the sense of completeness of a work. If the work is all the performances including those to come, then the work is not complete at all, and this seems to contradict our sense of the work being completed when the composer considers it finished.

2) Goodman's thesis cannot either cover the idea that many works have never been performed, and still they continue be perceived as works by us. So again the work as the class of performances is insufficient to explain all our intuitions.

3) Finally, it does not help at all to explain that there are true things in the work that a performance sometimes cannot be compliant with. We feel that some performances

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<sup>192</sup> Goehr, 1992, pp. 74–75.

are more authentic than others, because we measure authenticity from a truth apart from the performance. So, there are more levels than that of the performing art.

Kivy compares afterwards, for the sake of presenting his own ideas, the symphony with *the* number two (different from *a* number two). He inscribes his opinion inside Platonism or realism saying that works are types, eternal and discovered. Meanwhile performances are spatio-temporal tokens, different in nature, although there are limits in that they have to be the performance of certain works. Just as in mathematics we talk about discovery when we say that Pythagoras discovered his theorem, or that proofs have been found, the same will be for musical works.

The Nominalist view can present to this Platonist view various objections, from which Kivy presents the defence for only four:

1) The first objection would be that works are created instead of being discovered, that they seem to us to be made. To this, Kivy answers that at least his opinion opens a 'new', 'refreshing', and 'insightful' way of seeing what composers do. And he puts the case of Beethoven's compositional process as exemplification of discovering works in the middle of an amorphous mass of sounds, by trial and error. What has to be said is that at least the idea of works led to the discovery of functions as if they were created. If you need still to explain originality, then the notion of first tokening serves by explaining that this moment of creation is also an important stage in the process.

2) Another idea against Kivy's view would be that works are not pure sonic structures but the instrumentation is important. To answer this, he points out that the performances would be sonic-structure instances. And that composers' attitudes regarding the means of a performance have varied through history and 'recently' in the 18<sup>th</sup> century instrumentation began to be fixed more strictly. But the tone colour is an included aspect of formalism, a part of the discovered type.

There is a further problem here for extreme Platonism. What happens with the artificial production of timbre i.e. synthesized sound, constructed sound? Here Kivy answers that although all performances are tokens of a type, not all tokens of the type are performances, synthesised sound being a case.

For some people this is not sufficient and they want to have an answer to the problem that a sounding not only cannot be a performance but cannot be an instance either. Kivy concludes here that there is nothing in musical scores that rules out the possibility of an instance being produced by something other than a performance act, at the same time being an instance but not a performance. Another question is in that we construe the musical performance as a visual occurrence as well. In this case, a concert

performance of an opera would not be an instance of this work, and the visual fact would be an aspect of the first token.

3) Works are the personal expression of an artist. Kivy says here that the personal stamp is in the first tokening, in being able to make it possible for us to hear what he/she has heard or discovered.

4) It seems possible to imagine a destroyed musical work. Kivy introduces Levinson's theory, the alternative to extreme Platonism: the qualified Platonism revisited above. Levinson is also attracted to the distinction type/token because of its suitability for the explanation of the pair work/performance, but he denies the possibility of musical works as discoveries. 'Created types', 'initiated types' are the key to his ideas. He associates works with the 'Ford Thunderbird', the 'Lincoln Penny', explains Kivy. All of these types were created at some point in human history.

Regarding the claim that works can be destroyed, for a Platonist a work can become nothing to us, but it cannot cease to be. However Levinson thinks that it can be destroyed. Kivy, on the contrary, feels strongly attracted to the idea of types that cannot be destroyed. An initiated type is an abstract object that occupies a spaceless, timeless realm with which we cannot causally interact. Such an object cannot be brought into existence through the agency of human action (even having the idea of a first tokening). The notion of an initiated type is incoherent; if it is initiated it cannot be a type, if it is a type it cannot be initiated, concludes Kivy.

This is the moment to return to the analyses of Ingarden's work, specifically the moment where he presents the thesis of the work as a non-real object on the basis of its supraindividuality, but more importantly, where he explains its supra and quasitemporal condition.

Ingarden opens the analysis on supratemporality with a paragraph that condenses all that he is going to present in the rest of the chapter:

If one considers the musical work as a completed product of the creative activity of the composer, a formation which, from the moment in which it has originated, exists in all its phases (parts)—or with all its parts—then it is an object *existing in time* [...]

But if one considers the musical work exclusively with respect to its content, as it forms an Object of the aesthetic apprehension that opens to us the access to all its phases (parts) and their sequence, and if at the same time one contrasts it with all individual events unfolding in time in the real world, and especially its performances, then one arrives at another result. The musical work then

presents itself as a peculiar supratemporal object, which nevertheless possesses an immanent quasi-temporal structure.<sup>193</sup>

The quotation above shows clearly the three moments of the argumentation: i- temporality of the performance, ii- supratemporality, and iii- quasi-temporality of the musical work.

Every real process has a particular ‘coloring’ that makes it unrepeatable. This time is contrasted with the objective time of physics. The coloring depends on what is unfolding at a certain moment. But it also depends on the temporal colorations of earlier phases. If we attend to the performance, we perceive it in the fullness of its concreteness and therefore in its distinctive temporal coloring. In contrast, the musical work is free in its content from the temporal coloring. This is because in order to foresee the temporal colorations of every performance, they would have to be polysemically determined by the score, which is impossible. Moreover, the temporal colorations cannot be foreseen by the composer.

Every *real process* which occurs in the real world takes place in a definite, nonrepeatable segment of time. Whenever the process enters our perceptual field, it has in all its phases, as well as extending, so to say, over all its properties, a certain distinctive time quale of the pertinent segment of concrete time, since it is constituted in this time by the unfolding of its phases.<sup>194</sup>

This time is also characterised by having the past and present moments but never the future.<sup>195</sup>

Ingarden first offers a definition for the concept of supratemporality.

This and only this is what should be meant when we say that the musical work is, with respect to its content, “supratemporal”: It itself is not determined by the score in the temporal colorations of its individual performances [...]

But it cannot be considered a temporal object in the strict sense, because the finished work possesses all its parts (for example, the individual “moments” in the musical sense) simultaneously in each moment of its existence, which is impossible for a genuine real process that unfolds only in the course of time.<sup>196</sup>

Every musical work possesses a multiplicity of phases that in general form a continuum and follow one another. These parts are univocally established.

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<sup>193</sup> Ingarden, 1989, p. 37.

<sup>194</sup> Ibid., pp. 37–38. Sketch of ‘experienced time’ developed by Bergson and Husserl.

<sup>195</sup> Pytlak, in Dziemidock-Mc Cormick, 1989, p. 238.

<sup>196</sup> Ingarden, 1989, pp. 39–40.

Now, this is true unless one thought of the problem of aleatorism. In fact, there are musical productions that are not conceived in these terms, in which there is nothing established temporally speaking or only more or less fixed paths to follow (vanguardism, early-improvised music).<sup>197</sup> Be they univocally established or aleatoric, let us concede that they present a longitudinal form when accomplished, from beginning to end, thus becoming a ‘quasi-temporal’ object. Still they would be a temporal object in the meanwhile, not a supratemporal one, since these works do not possess all the parts simultaneously—which would mean that future is excluded, whereas only past and present are available to us. Ingarden was not contemporaneous of aleatoric music, which could complicate matters.<sup>198</sup> His theory must be expanded nowadays to include these cases also.

To reach the concept of supratemporality Ingarden offers an excursion into the ‘quasi-temporality’ of musical works.

[...A]lthough the work is free of those colorations of the time phases in which its individual performances take place, the work’s individual parts (its “phases”) exhibit specific “temporal colorations” which are immanent in the work itself and are exclusively a function of the filling-out of the phases of the work itself.<sup>199</sup>

In musical works, we have a ‘beginning moment’ and a ‘succeeding moment’, the latter being determined by the first by means of a situation called ‘anticipation’. ‘Anticipation’ means 1- that one phase will be followed by a later one, and 2- that the filling-out of the later phase will be within certain limits of indeterminateness of a certain kind and no other. Then we have as a slit-like moment between the retention and protension, the ‘present’ or ‘now-point’ of the work. The present is the ‘announcing phase’.<sup>200</sup>

In music, what is announced does not necessarily have to follow; this is very clear in avant-garde discontinuous music but also in unexpected moments in tonal music. This situation in music is unlike a similar situation in logic. In temporal logic, the definition  $FA = \neg G\neg A$ —the future of an event is equivalent to the fact that this event will never be false—, the axiom  $A$  then  $HFA$ —if some event is true, then ever will be the case that this event will happen—, or the theorem  $\neg HFA$  then  $\neg A$ —if it never has been the case

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<sup>197</sup> See Zofia Lissa’s critique to Ingarden in “Some Remarks on Ingardenian Theory of a Musical Work,” Piotr Graff and Slaw Krzemien-Ojak eds., *Roman Ingarden and Contemporary Polish Aesthetics, essays*, 1975, p. 129–144.

<sup>198</sup> Pytlak, in Dziemidock-Mc Cormick, 1989, also notices this in his critique to the musical work as a purely intentional object that is completed as an ideal boundary before the performance, pp. 241–242.

<sup>199</sup> Ingarden, 1989, p. 40.

<sup>200</sup> *Ibid.*, p. 41.

that in the future an event will happen, then it will not happen—, confirm this irreversible sense of directionality.

Still, continuing with Ingarden's argumentation, moments in music, expected or unexpected, would tell about 'earlier' and 'later' phases and of the quasi-temporal structure of the work. Kramer explains that unexpected moments in tonal music deny expectation searching for an expressive effect. Ingarden himself says that these procedures in fact emphasize the earlier–later relation.

A question arises here. Is Ingarden's 'quasi-temporality' preserved even in extreme non-teleological cases, where there is no 'anticipation'? One could say that music always, in a chronological sense, is directed forwards, but not in the sense of its created time, which is displayed on top of it and can show, conceptually speaking, also circular or branching shapes. These new structures would provide other ways of conceiving musical time.

This quasi-temporal, seemingly teleological structure, according to Ingarden, is what has been called 'musical time'. Ingarden's sense of musical time will be broadened in this thesis, including not only what he called (the teleological) musical time, but other forms that progressively destroy this pattern, closer to Kramer's approach, who speaks already of multiple modes of this 'quasi-temporality'.

For the remainder, it is interesting to reproduce his insights about the absence of conclusion in real time and its presence in music. 'Conclusion' means "something after which nothing more follows"<sup>201</sup>. This would be unthinkable in real time. Music, on the contrary, concludes; real processes end, says Ingarden.

Again, this is not true for recent music, where music that concludes emphatically coexists with music that merely ends, and likewise, music that begins coexists with music that simply starts. Moreover, there are examples of (in principle) never-ending music. In the first problematic case, music ceases, but does not finish. Finally, in the most radical case that of pieces conceived as non-ending it neither finishes nor does it cease. Examples that could be mentioned here are Erik Satie's (1866–1925) *Vexations* (1893) and John Cage's (1912–1992) *Organ<sup>2</sup>/ASLSP (As SLOW as Possible)* (1987).

To conclude, 'supratemporality' means that:

[...T]he continuum of the temporal colorations of the work's phases, a continuum immanent in the work, is determined exclusively by the elements of the work itself [...] The temporal structure of

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<sup>201</sup> Ingarden, 1989, note 29.



the musical work itself is completely proof, so to speak, against all events and processes of the real world taking place outside the work.<sup>202</sup>

[T]he supratemporality of the musical work confers upon it the character of “not belonging to this world” and contributes to the complete delimitation and closure of the work.<sup>203</sup>

Concluding, what in this thesis is going to be called the temporal structure, and despite of deviating interpretations from Ingarden, will give us the identity of the work.

These sentences are some of the deepest ever written about musical time, although they deserve an actual revision or addenda. Ingarden is setting the bases for developing not only the ontology of the musical work for the first time, but also an ontology of music and further, of musical time.

He divided the concrete temporal colorations of the real lived time from that proper of the work itself. He conceived of musical time as a supra time in that quasi-time. This thesis assumes this position as a point of departure.

To sum up, ‘supraindividuality’ and ‘supratemporality’ would be the characteristic notes that distinguish a musical work from other natural and acoustic signals. ‘Supratemporality’, however, has nothing to do with the ‘atemporality’ of ideal objects posed by Platonists.

All this shows levels of temporality: the level of physical or chronological time, the level of the experienced time of the performance, where the temporal colorings happen fused with the concrete tone formation in an especially intimate way,<sup>204</sup> and the level of the work, with its quasi-temporal orderings defining its final supratemporality. All these levels will be fundamental in explaining musical time. This thesis focuses on the quasi and supratemporal levels.

The distinction between the field of the temporal in the material world and the temporal colorations of the time experienced by the listener and by the performer, resembles the distinction between objective and subjective time respectively, altogether describing the nature of musical time.

Ingarden explains that, regarding the continuum of phases quasi-temporally determined, it has its ontic foundation in musical formations, primarily of tonal nature such as motifs, melodic-harmonic units of meaning, themes, and movements. Meanwhile, the particular properties of rhythm and tempo as well as dynamic properties determine a more important role in what he calls the ‘temporal structure’ of the work.

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<sup>202</sup> Ibid., p. 43.

<sup>203</sup> Ibid., p. 44.

<sup>204</sup> Ibid., p. 38.

‘Structure of time’ or ‘temporal structure’ means however for the present thesis what Ingarden calls the ‘quasi-temporal’ arrangement, which will be tackled in principle in comparison with the formal tools of temporal logic and later interpreted in terms of philosophical and cultural conceptions in Chapter 5.

Summarizing, Ingarden’s analysis comprehends on the one hand what is called here the ‘nature’ of musical time, objective and subjective time would have as respective antecedents his analysis of physical time vs. the temporal coloring of the concrete performances. On the other hand, Ingarden’s ideas offer an antecedent for what will be called the ‘structure’ of musical time in his analysis of ‘quasi-temporality’. However, it appears limited to linear music.

Ingarden goes ahead towards positively determining the mode of existence of the musical work—having defined it before just negatively, as a non-real object. In this context the elements and features of a musical work are going to be analysed.

For Ingarden, music possesses both, fundamental ‘tonal’ moments and multiple ‘non-tonal’ determinations. The fundamental moments of the work are tonal or noise qualities.<sup>205</sup> There are tone formations such as ‘x’, ‘y’, and ‘z’ that together form higher formations, up to the design of entire coherent wholes. Melody, rhythm, harmony, agogics, dynamics and timbre, are the elements from which music is elaborated. The individual tone formations are characterised by a selection of these features. The first three are the basic ones, whereas tempo, dynamics, and timbre are seen as secondary in that they are not constitutive structural elements, i.e. we can change them a little without fundamentally changing the work.<sup>206</sup>

Non-acoustic formations are constructed on top of the tonal basis. Again, as with tonal components, some are indispensable or essential to the musical work, some just dispensable. They are going to be presented as extra-acoustic but not for this reason alien to music, and ordered according to its proximity to the tone formations. Ingarden presents seven: i, temporal structure; ii, movement; iii, form; iv, emotional qualities; v, feelings expressed; vi, presentational motifs; vii, aesthetic value qualities.

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<sup>205</sup> Pauses must also be considered here.

<sup>206</sup> Pytlak, 1989, adds that Ingarden’s description of the primary elements of music has lost currency if we think about the case of concrete music.

*The Musical Work as an Intentional Object*

Ingarden proceeds immediately afterwards to describe the mode of being of the musical work.<sup>207</sup> The work itself arises out of certain psychophysical creative activities of the composer. These activities can culminate either in writing the work as a score or performing it directly without mediators.

In the case of a score, the work is defined schematically by specifications that are purely tonal, leaving open places of indeterminacy for other parameters that can be filled-in in a performance.

This fact alone is sufficient reason to regard a work set down in a score not as a real, but instead as a purely intentional object which has its source of being in the creative acts of the composer and its ontic foundation in the score.<sup>208</sup>

On the contrary, the cases of performance and of recording open the question of whether the musical work is an intentional object at all if the performance given by its composer is the ideal one and there are no gaps of indeterminacy in case of its reproduction by a recording. This situation would weaken the thesis of intentionality, leaving the possibility of defining the work as a real object.

Still, regarding performance, history has taught us that composers seldom understand everything contained in his/her own works and that seldom are they good performers. Moreover, in the case of works of big dimensions, like a symphony, it is impossible to perform all on their own. About the recording, the exact reproduction of the work by modern methods is neither identical to the work itself—which is a de-individualised object, i.e. free of individualising features—nor to the performance, that always differ essentially one performance from another. What are reproduced there, instead, are mere physical processes.

Concluding, Ingarden says that the musical work can be nothing but an intentional object:

[...] There is no doubt that the self-identical entity that could be apprehended on the basis of individual performances not only is not a real object—as has already been shown—but also can be nothing other than a purely intentional object of a special kind.<sup>209</sup>

If the work were identical to the multiplicity of individual tones produced in a given performance, one could take the standpoint of naive realism. But again it cannot be identified with individual tones, nor limited only to acoustic moments, since it contains

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<sup>207</sup> Ingarden, 1989, pp. 90–94.

<sup>208</sup> Ibid., pp. 90–91.

<sup>209</sup> Ibid., p. 92.

non-acoustic moments as well. It is a supra-individual entity that transcends every concrete real object. This is a second argument for considering works as purely intentional objects.

[The musical work] must have several different ontically autonomous foundations of its being: Individual psychophysical acts of the composer; real processes in the world which found *realiter* each individual performance; and finally the various acts of consciousness and real physiological processes of the listeners.<sup>210</sup>

This does not mean subjectivizing or that the musical work is a mental object. The musical work is something that we can create intentionally and not *realiter* and with which we can commerce intentionally. It is transcendent to all concrete individual mental experiences; it forms no 'real part' of experiences.

Going now beyond Ingarden's arguments in *Ontology*, it is possible to think of other cultures and their concept of music as not depending on 'work' notions and thus on intentional objectivities. According to Pytlak, aleatorism and its uncomposed fragments of music show the faults of Ingarden's work today. Pytlak addresses that an intentional object does not explain the case of something that still does not exist or does not exist at all. The 'gap' included in an unfinished composition would not be determined by any intentionally created schematic pattern.<sup>211</sup>

Pytlak, in his revision of Ingarden's work on musical work,<sup>212</sup> notices a key argument for adding necessary, complementary remarks on Ingarden's theory: that the existence of the musical work *would not be exhausted by the purely intentional object*. Pytlak proposes at this stage an alternative argumentation that in the end moves the question from an ontology of musical works to an ontology of music:

One way to move closer to the solution of the problem of the identity of a musical composition, separating its specific structure from other phenomena and acoustic formations, would be to find a marker characteristic of music.<sup>213</sup>

Ingarden, according to Pytlak, bypassed an important characteristic of the musical work, its 'pure dynamism'. In this sense, Ingarden had proposed in the *Ontology* some theses about what would constitute the marker characteristic of music: a) the order of sounds either in co-occurrence or sequence, b) new factors such as melody, rhythm, harmony; c) something specific distinct from acoustic signals and sounds of nature. The results were: regarding a), the order of sounds is insufficient; about b), tonal and non-

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<sup>210</sup> Ibid., p. 93.

<sup>211</sup> Pytlak, 1989, pp. 241–242.

<sup>212</sup> Ibid., p. 247.

<sup>213</sup> Ibid., p. 248.

tonal formations do not set music as a unique phenomenon and can be found elsewhere; c) does give the key for understanding music: the sound of music does not refer to anything but the sound, in its supra-individual sense, as a configuration of pure qualities.

### *The Historical View*

Lydia Goehr, in her book *The Imaginary Museum of Musical Works (An Essay in the Philosophy of Music)*<sup>214</sup> introduced us to the most relevant theories in the ontology of musical works, to later present her own view which she called the ‘historical approach.’ The preceding theories are the ‘nominalist’ and the ‘platonist’, both considered analytic and ahistorical in nature. The representatives of each theory, already treated above, are Nelson Goodman and Jerrold Levinson respectively.

Goehr separates analytic from non-analytic theories and at the same time presents her historical approach. The analytic approach dealt with topics such as the idea that works are created (instead of being ideal entities), performed many times and in different places, not exhaustively captured in notational form, and intimately related to their performances. The non-analytical approach is found in Ingarden—who nonetheless had many points in common with analytic approaches—Jean-Paul Sartre (1905–1980) and Martin Heidegger (1889–1976), among others. On the other hand, the historical approach explores the genesis, content, and function of musical concepts—Carl Dahlhaus (1928–1989), Walter Wiora (1906–1997) and others—and in addition presents ideas on musical form and time, expression, contemplation, and meaning. Goehr chooses the analytic view to begin her critique, saying that it has the advantage of being unadulterated, uninfluenced by external considerations, showing with purity the issues of its inquiry. Paradoxically, this would constitute the main objection to the approach. Instead, what she proposes is a historical based ontology, which does not break completely with analytic ontology.

Four basic views can be distinguished in the ontology of music according to Goehr:

- 1) Platonist: works seen as universals (Kivy). It includes also the quasi-platonist view: works seen as ‘initiated types’ (Levinson). To understand the differences inside this view, we could say that works are seen as independent or dependent, distinct entities. That is, either independent from the human intentional act and scores and performances, or dependent on all of them.

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<sup>214</sup> Goehr, 1992, pp. 87–119.

- 2) Aristotelian: here works are essences exhibited in performances and score-copies. Each work is identified with the sound pattern presented in each performance (Walton).
- 3) Nominalist: works are interpreted here as ‘works’, when only concrete performances and score-copies exist. Works are like linguistic items serving to refer to certain classes of particulars. Goodman sees works as classes of performances perfectly compliant with scores.
- 4) Idealist: this view, although considered outside analytic theory, considers that works are the ideas formed in the minds of composers. Works are imaginary things (Collingwood, among others).

The analytic view searches for two key questions: the first about the existence of works, either as kinds, essences, or names, as we exposed above, and the second, about the identity and individuation conditions for works. Regarding the latter, the approach has found suitable the Occamist, reductionist tendency that a work is not just any group of sounds, but complex structures related in some important way to composers, scores, and classes of performances. However, Goehr asks from now on if it is possible to have a balance between philosophy and musical practice in the analytic approach. And she searches for an answer focusing on Goodman’s and Levinson’s theories.

On the other hand and just indirectly related to her claim in her *Imaginary Museum*, it is worth introducing this historical view applied not anymore to the work-concept but to the time-of-music-concept, more relevant to this thesis. It is not only a question of the sort: Are there time structures exclusively related to certain moments in the history of music? And what kind of nuances can we find exploring the same temporal structure within different cultural contexts? But a moving towards: What are the conditions that made the time-of-music-concept so effervescent to us today? Is it that time structures have to be considered as appearing in a moment of particular reflexion about musical practice?

We are going to pay attention only to Goehr’s argument in its simplest version. It consists of showing the historicity of the work-concept as the key for understanding what a musical work is. In fact, this concept began to regulate musical practice at a certain moment in time. All this tends to amplify the scope of earlier analyses in the sense of “making ontological claims compatible with the historical and conceptual complexity of the subject-matter with which they are associated”<sup>215</sup>.

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<sup>215</sup> Ibid., p. 89.

Goehr presents what she calls ‘the ontological picture’ of the historical investigation. The concept of musical work is i) open, with original and derivative employment; ii) correlated to the ideals of a practice; iii) regulative; iv) projective; and v) emergent.

i) The theory of open (and closed) concepts was anticipated by Nietzsche (1844–1900), developed by Friedrich Waismann (1896–1959) and noted by Ludwig Wittgenstein (1889–1951) in his *Philosophical Investigations* (1953).<sup>216</sup> This theory was introduced when we faced a methodological reorientation, “a move away from asking what kind of *object* a musical work is, to asking what kind of *concept* the work-concept is”<sup>217</sup>. This reorientation is associated with the linguistic change of contemporary philosophy in general.

The three main ideas of the theory of open concepts are: 1- the use of concepts reveals their meaning, 2- an essentialist or realist theory of meaning is rejected, and 3- the meaning of concepts cannot be analysed independently of the context of their practice. All this is consistent with a peculiar view of language which is going to be analysed in Chapter 3.

Open concepts i) are not fixed or static essences; ii) do not admit ‘absolutely precise’ definitions in terms of necessary and sufficient conditions; iii) they are intentionally incomplete, in that a change of modification of its meaning cannot be eliminated; iv) are finally related to vague concepts.

They can be open or closed, and the latter has to be distinguished from fixed concepts, that define an essentialist view of language and the world. Concepts can be closed for certain purposes and open for others. Funding and insurance purposes work most effectively with closed concepts, while aesthetics and criticism work better with open concepts. A closed concept then can have an exact and complete definition designed for a special purpose. If we wanted a change in the system we should replace the concept.

In contrast, open concepts do not need to be circumscribed within boundary conditions or their definition confined to canonical cases. Open concepts are modified and amplified but not replaced. Thus, continuity is the key for open concepts. This leads us to search for a genealogy of the concept in a determined practice—let us suppose, moral or artistic. And the identity is guaranteed because of a continuity of connected previous and actual uses. An open concept gives us tools for explaining how an object

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<sup>216</sup> Wittgenstein, *Philosophical Investigations*, § 67 ff.

<sup>217</sup> Goehr, 1992, p. 90.

falls under one but not at another time. It is false that ‘anything goes’ regarding open concepts; changes are allowed within a connection of uses.

Goehr quotes Morris Weitz (1916-1981), in *The Role of Theory in Aesthetics* (1956), who claims that although there is no fixed set of defining properties for works of art, there are paradigm examples of them. On the contrary, Paul Ziff (1920–2003) wants to go further, in *The Task of Defining a Work of Art* (1953), he claims that neither a set of defining properties for something to be art, nor a paradigm example of art exists. At this moment, Goehr asks if paradigms can be necessarily associated with an essentialist view. Rather she is tempted to think jointly with Weitz that however changeable a concept may be, it is possible to find paradigmatic examples. They are paradigmatic in the sense of playing a particular role during certain time in the practice where they exist.

Regarding the musical work concept, there was an ‘institutionalized centrality’, according to Goehr, that yields to choose certain examples as paradigmatic. Moreover, this principle is in contrast with a principle according to which our choice is moved by what we like best, or what is produced contemporaneously. Goehr introduces her distinction between original and derivative examples of the work-concept, since the historical approach provides us tools for paradigmatic as well as non-paradigmatic examples.

The model of the open concept provides also an understanding of the objects that fall under it. To show this, a division should be made between identity conditions and ideals. The distinction serves to allow the move from the description of objects to the description of regulative concepts and the projective existence of objects.

In response to Frank Ramsey’s (1903–1930) idea of logic as a normative science,<sup>218</sup> Wittgenstein says that it is false that language is meaningful only if it consists of fixed (logical) rules and only if it approximates an ideal language (consisting of fixed and exact rules). Goehr takes a passage of the *Philosophical Investigations* to say something different: “Ideals are what we strive towards within our practices”.<sup>219</sup> Goehr thinks, with Wittgenstein, that these ideals cannot be explained independently of the relevant practice or be articulated in terms of fixed rules.

For example, accurate notation and perfect compliance are demands that must be met or satisfied in terms of Goodman’s theory, where the ‘must’ has to be understood in a Leibnizian logical sort. It is sufficient to have these conditions for being what it is.

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<sup>218</sup> Ibid., p. 97.

<sup>219</sup> Wittgenstein, *Philosophical Investigations*, § 81. See Goehr, 1992, p. 98.



Goehr has already demonstrated a problem with identity conditions in the intersection between theoretical and practical considerations. But here she adds:

Most if not all identity conditions for works and performances are, in my view, mistranslations of ideals that exist within classical music practice. In all translation something is lost. In this case most of the empirical and ideological content is drawn off, leaving what we have seen to be little more than generic formulations.<sup>220</sup>

The ideal of perfect compliance has not always existed and might not exist in future. She defines the ideal as something that it is rarely if ever realized in a perfect way, but still not undermined in its existence and force. If it is an ideal, then perfect notation is not a prerequisite for the functioning of a score; perfect compliance is not a prerequisite for a performance.

A further difference between identity conditions and ideals is that the latter are action-guiding. Moreover, talking about ideals forces us to look at the historico-conceptual foundations of practice in a way that the traditional search for identity conditions for musical objects does not.

It is precisely because musical practice works with ideals that some concepts are interpreted as regulative. Kant was the first to introduce the term in philosophy, and notably René Wellek (1903–1995) and Austin Warren (1899–1986) did their part in modern aesthetics in *Theory of Literature* (1944–46).<sup>221</sup> They pointed out that artistic genres worked regulatively. “The real poem must be conceived as a structure of norms, realized only partially in the actual experience of its many readers”.<sup>222</sup> Goehr’s view is different from them, in that she keeps normativity and regulation on a general level. “I suspend (without loss) consideration of the former view and speak not of each work, but of the concept of a work, as a regulative concept”.<sup>223</sup>

Regulative concepts differ from constitutive concepts in that the latter provide the rules of a practice, while the former indicate the reason for following those rules. A regulative concept determines the normative content of subsidiary concepts as it does the content of associated ideals. At the same time, subsidiary concepts and ideals determine the normative character of the regulative concept.

The concept of musical work, for example, emerged in line with the development of numerous other concepts, some of which are subsidiary—performance-of-a-work, score, composer—some of which are oppositional—improvisation and transcription. It also emerged alongside the ideals of

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<sup>220</sup> Goehr, 1992, p. 99.

<sup>221</sup> *Ibid.*, p. 102.

<sup>222</sup> *Id.*

<sup>223</sup> *Id.*

accurate notation and perfect compliance. In this process, the work concept achieved the most central position.<sup>224</sup>

Regulative concepts are also delimiting and indirectly suggest certain beliefs and values to be held and certain actions to be undertaken.

One shows one's knowledge and understanding of these concepts when one, for example, complies with the score, plays these notes and not others, plays in such a way as to indicate respect for the genre musically and historically conceived.<sup>225</sup>

How is it that regulative concepts are so stable? Kant said that they function stably because they are treated as if they were given instead of merely artificially emerged and crystallized concepts in the context of a practice. The same happens with the God-concept or the human freedom-concept, postulated as if they were transcendently given to justify our faith in morality and responsibility, respectively.

The following point is to introduce the projective nature of the work. Thus, due to the regulative capacity of concepts, any musical work is understood *as if* it were an object or *as if* it were something beyond the performance and score.

In a projectivist view, indicated by the 'as if' clause, works do not exist other than in projected form; what exists is the regulative work-concept'.<sup>226</sup>

The resultant of all this is that works are fictional entities. However, we still suppose there is 'something' which is a 'work'.

The projectivist thesis obliges Goehr to move from describing the ontological status of works-objects to an inquiry into the concept of musical work. There are three statements that justify this move:

i) the practice of classical music functions in line with a complex theory about what the practice is and should be like. ii) Within that theory, musical works are posited as existants. iii) Successful positing of works confirms the effective functioning of the regulative concept of a work within this practice.<sup>227</sup>

Statements i) and iii) particularly show how theory and practice work together. "Practice, [...], ultimately remains theorized, as theory ultimately remains practised."<sup>228</sup>

The work-concept emerges. Emergence entails development and crystallization of new theories, rules, tools and modes of behavior. Goehr interprets emergence as

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<sup>224</sup> Ibid., p. 103.

<sup>225</sup> Ibid., p. 104.

<sup>226</sup> Ibid., p. 106.

<sup>227</sup> Ibid., p. 107.

<sup>228</sup> Id.

opposed to causal action, since it does not imply pre-determination, rather, it is 'contingent' and 'retroactively discovered'. It is probable that elements by themselves never caused anything; its causal relation is seen at most *a posteriori*.

Emergence is not an *ex-nihilo* process and a concept's emergence cannot be separated from the history of the practice in which it functions. As a consequence, previous to the emergence of a concept, the threads of what becomes the content of the concept already exist.

Thus, prior to 1800 there were functioning concepts of composition, performance, and notation in musical practice, just as there were after that time. This is the continuity. The discontinuity lies in the fact that their significance, and the conceptual relations in which these concepts stood to one another, differed across the two time periods.<sup>229</sup>

At the moment the concept crystallizes, comments Goehr, happens what Hegel described as the unknown, precisely and paradoxically because of our feeling of familiarity.<sup>230</sup>

To discover this process neither precise dates nor philosophical definitions are worthy. The latter idea seems hard to defend since we always presuppose a definitional understanding. However, this only can be accepted if we meant working definitions (those with which we operate everyday) instead of philosophical ones. Working definitions go hand-by-hand with the theory of open concepts. Finally should we dispense with definitions of philosophical sort? No, because philosophical definitions and theories play an important role in the development of a practice. Moreover, Goehr goes ahead and shows the philosophical content of her claim.

The central claim consists of defending that the work concept began to regulate musical practice at the end of the eighteenth century. It is probable that one makes an objection about the notion of workhood employed.

[...] Someone might suggest [...] that musical workhood covers a spectrum of cases ranging from the most neutral and general to the most contentful and specific, from the ideologically free to the ideologically specific. The description of works I have given falls at the latter end –the specific and the ideological.<sup>231</sup>

But instead of giving a circular definition of musical works as a category in which all musics fall, she prefers a concept installed in the musical practice. What she calls the pre-critical description appears as such only because of its familiarity. Critically, it emerged during Romanticism alongside the idea of music as an autonomous fine art.

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<sup>229</sup> Ibid., p. 108.

<sup>230</sup> Ibid., p. 109.

<sup>231</sup> Ibid., p. 111.

Goehr expresses her central aim: “[...] I am interested above all in resisting the inclination to say that the work-concept must always have functioned in some manner. The work-concept is not a necessary category within musical production”.<sup>232</sup> Prior to 1800 musicians were dealing with concepts of opera, cantata, sonata, and symphony, but this does not imply that they were producing works. To call these manifestations ‘works’ is due only to a retroactive attribution, so part of an anachronistic discourse.

Goehr addresses that commonly musicologists put the beginnings of the work-concept in the early sixteenth century.<sup>233</sup> Moreover, they locate the origin of this concept in the writing of Nicolai Listenius, where the author describes the three ‘theoretic’, ‘practique’ and ‘poietic’ dimensions of music. Some scholars have seen the beginning of the concept mainly in the third poietic activity.

Poetic [music is that] which is not content either with an understanding of the subject or with practice [*exercitio*] alone, but rather leaves some *opus* behind after the labour, as when music or a musical song is written by someone, whose goal is a complete and accomplished *opus*. For it consists in making or constructing, that is, in such labour that even after itself, when the artificer is dead, leaves a perfect and absolute *opus* [*opus perfectum et absolutum*].<sup>234</sup>

Precisely the last phrase, ‘*opus perfectum et absolutum*’, has been interpreted to indicate the work-concept. It seems that Listenius has benefited from Aristotle and his traditional tripartite divisions in this case applied to the spheres of human activity such as knowledge (*episteme*), activity (*energeia*) and making (*ergon*). Goehr’s answers this argument:

First, the work-concept is much related to Listenius’s *opus absolutum et perfectum*, as it is to many ancient concepts. Second, even if it was true that Listenius gave crystal-clear expression to *musica poetica* (which he did not), this would not mean the work-concept originated with him. Third, looking for origins always threatens an infinite regression backwards through history.<sup>235</sup>

The Aristotelian reading also suggests that the phrase denotes a finished product which is the outcome of work or activity (*opus/labore*). However, and independently of the rightness of this reading, it would not entail the correctness of the argument. Goehr remarks that Listenius does not specify for example if the *opus* existed as a completed creation before its performance, if as a musical work its structure would have been preserved entirely in a score, not even if it has been conceived as unique, repeatable in performances, if its existence above its performance would have been the *telos* or goal

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<sup>232</sup> Ibid., p. 114.

<sup>233</sup> Ibid., p. 115.

<sup>234</sup> *Musica: Ab authore denuo recognita multisque novis regulis et exemplis adaucta*, 1549. See Goehr, 1992, id.

<sup>235</sup> Ibid., p. 117.

for musical activity. It seems then that *musica poetica* have been introduced to emphasise the idea that an understanding of how to make music is as important as theorizing and performing. Note that one can make music or compose without producing a musical work.

Finally, a way to avoid infinite regression is to distinguish the search for origins of a concept's emergence from its adoption as a regulative concept. The distinctive touch Goehr's essay has, that differs from other works on the history of the concept of musical work, is that she devotes all the time to describe the emergence of the work-concept amidst the aesthetic, sociological, and ontological considerations of the late 18<sup>th</sup> century.

She points out the importance of abandoning the ontology of the musical work as it was developed earlier, and postulates an ontology of music as a better path. However, as she criticised directly the analytic tradition, Ingarden's analysis was not touched at all. Specifically, Ingarden's ideas on supra and quasi-temporality of music can be read as not exclusive to 'works' at all, and seem to be suitable for all music. This would reinforce Scruton's defence of the idea that certain topics are a-historical; Goehr's historical claim being momentarily unaffected by this fact.

#### *Roger Scruton, Return to Ingarden and Further Contribution*

Scruton,<sup>236</sup> in his turn, defends the thesis of the intentional identity. Agreeing with Levinson, he says that musical works are identified as structures or patterns that are realised in physical sounds. But the problem is that the intentional character of the musical work is not delivered jointly with its structure. As a consequence he concludes:

[...W]e should not expect a theory of musical ontology to give us an account of the intentional object of hearing. If it strays into the world where the musical individual is encountered, it is a world of metaphor –of things that do not and cannot exist. If it stays in the world of sound, then it can do no more than specify the sound patterns that make the musical experience available. There is no third possibility, which means that there is nothing further to be said.<sup>237</sup>

Scruton points out from the beginning of the chapter the problem of numerical identity as the background metaphysical problem, passing through all levels of beings: 1) things, 2) properties, 3) types, 4) patterns, 5) structures and abstract particulars, 6) events, and 7) actions.<sup>238</sup>

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<sup>236</sup> Scruton, 1997.

<sup>237</sup> Ibid., p. 117.

<sup>238</sup> Ibid., pp. 101–108.

Regarding *things*, we use to define their identity either by convention/decision, because it is given by the subject, or because of the nature of things. The first corresponds to material objects. Sometimes we define by convention that something is identical with its contrary reply, as the 'Theseus ship', that was reconstructed piece by piece and described as the same thing as its predecessor. With entities called 'persons' it is difficult to describe them in equal terms as above. It seems that the subject attributes himself or herself an identity that is not transferable. Regarding entities such as animals, we say that they are identical because of their nature, by their continuity as living beings. The fourth group would be the subatomic entities, but they seem to be hardly recognised as things, in that they are not still organised in systems, as those mentioned above.

*Properties*, as for example the case of blueness and certain range of wave lengths, have lesser precision. They can be perceived otherwise and still be what they are. As conclusion, it is not decisive to define a criterion on the identity of properties.

*Kinds* determine the nature of things that fall under it. Blue things cannot be kinds; elephants and tables do. Kind 'a' is identical with kind 'b' if and only if in all possible worlds something is an 'a' only if it is a 'b' and viceversa. This adds a clearer notion to identity.

*Types* are a kind of kind defined by salient features and functions, as in the example 'Ford Cortina'.

Concerning *patterns*, *structures* and *abstract particulars* each type is associated with a pattern, a set of instructions. *Patterns* are called 'designs' also to highlight their creative nature. A *structure* is abstracted from its instances, instead of being realised in its instances as the pattern. *Types* can be seen either as universals or *abstract particulars*. Design or structure A is identical with design or structure B when every realization or instance of A is identical with some realization or instance of B and viceversa.

Finally, *events*: the concept of numerical identity is here problematically applied. Although they are processes, they are identified by its lasting through time like, for example, my neighbor's party. We are faced with events that cannot be reduced to process identity. Even in the case of the wind waving the branches of a tree, we do not have clear criteria for describing how many events we see there, when each starts and finish, and when we reidentify it across time. This is radicalised in the case of pure events (i.e. musical events), events that do not happen to anything, identified by themselves and not through other things (as instead it could be the case of a car crash event). For identity over time it is far less clear than identity at time.

With the expression ‘did you hear that sound?’, we could say that a sound lasts as long as the physical process that produces it. But there are cases in which the physical process is interrupted but the result is not that of different events (as in the case of the orchestra dividing the same gesture across all the musicians being perceived as a whole). In this world of pure sound, qualitative identity determines numerical identity. Scruton explains that in this case the experience of the same again is that of similarity and not the recognition of an individual. But what happens with a theme or a chord? 1. That sounds belong to types, recognised through their features. 2. That individuals in music do not exist in the material world of sounds; they are not even sound types, but *tones*. The theme is an intentional object and to recognise it as the same again is to make a judgement of intentional identity.

Pitch and duration are the most salient features that define musical types. For a more vivid musical experience we require rhythm and movement, characterised by a temporal organisation of successive sounds. Pitches and durations are presented in scores, they are features that form our primary way of identifying sound types, instructions that are realised in performances when the instance of a pattern is produced. The problems of identity of the musical work are related to two questions linked to the nature of the individuals realizing it: 1. they have fuzzy conditions of identity, they suffer from being pure events and 2. they are products of human actions.

In the last considered case of *actions*: actions are events, so they have the same identity problems as events, but have further problems from their intentional character. Movement is different from action, action involves intention. An action depends for its identity on the intention behind it (a movement that causes death may be a murder in the case of humans but no in animals). Works of music are intended objects as well. We grasp the intention behind an action in an unconscious dialogue with the agent.

As a conclusion, for Scruton the work does not have a material, but an intentional identity, the work is what we listen to or we have the intention of listening to in a sequence of sounds. This can only be grasped through metaphors, by false descriptions. There is nothing in the material world that is the work.<sup>239</sup> According to Scruton, this does not mean that the work is in another dimension, world, or level of being, as Roman Ingarden believed. Rather, it reminds us that questions of numerical identity are not all important.

To identify the work of music in the material world is to identify the sound pattern intended by the composer, which is realised in performance by producing sound events.

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<sup>239</sup> Ibid., p. 108.

The salient features of a work are those which contribute to its tonal organisation. The piano reduction, orchestral arrangement, the transposition, all coincide with the organisational foreground. It is when a work is arranged so as to disrupt its rhythmic, melodic, or harmonic organisation that we are inclined to deny its identity with the original.

The question of the relation work-performance is more difficult since performance is an attempt to determine the intentional object of a musical experience, by realizing the salient features of a sound pattern but also completing those that are not specified in it.

It follows that a work of music can be fully identified through a system of notation; any one which unambiguously identifies the salient features of the sound pattern will identify the work. But not every notation does it. There are looser and stronger identity conditions. There can be the case of figured bass, where it suffices to follow the chords, the patterns of the figure's bass line, to achieve a version of the work. Or one may think of the case of aleatoric music or improvisation, of meeting loose conditions. Goodman presented a strict criterion for identity: the score uniquely identifies a work of music, so that any performance that exactly follows the score and obeys all the instructions contained in it is a performance of the individual work.

Scruton is of the idea that numerical identity is not the point, but what concerns us is qualitative similarity. We wish to know how far two tokens can vary without violating our sense of the same again. And that is not determined by a criterion of numerical identity ranging over material objects, not even if those objects are abstract particulars or items of notation. The identity that concerns us is an intentional identity—an identity in appearance, which translates into no material fact.

Levinson remarks on the danger of describing the identity of a musical work in abstract terms as sound structures or sound types. If works are abstract objects or universals, then they are eternal, like all such entities. A work does not come into being when composer writes it down but he/she discovers it and it might be discovered by another composer at some other time. This misallocates an important aesthetic quality of the work: its originality.

A work, according to Levinson, is a sound structure as specified by so-and-so at such a time. The musical design is the result of an action. A problem arises here in that it can be that the work construed in this way may exist as a timeless entity although there is a personal encounter with it. Peter Kivy concludes that works are discovered instead of made. To this, Scruton replies that the first performance of an action, although it indicates a pattern, is likely to be regarded as a peculiarly important instance.



For Scruton, both Levinson's defence and Kivy's attack on it shows precisely what is wrong with Platonism. The sense in which types, kinds, structures, and patterns are eternal does not prevent them from having a history.

The eternal nature of the type consists merely in the fact that considered as a type, temporal determinations do not apply to it; it does not imply that it preceded its first token, for it is only through its tokens that can precede or succeed anything.<sup>240</sup>

### **2.1.2. The Ontology of Music**

The central author presented in investigations on ontological issues concerning music was Roman Ingarden. However, his investigations were developed or circumscribed to the notion of the 'work of music', carrying the weight of being a historical, short lived concept, in Goehr's terms. As a conclusion, we read some necessary adjustments in Scruton's analysis, which reduced the problem of going further into identity issues.

Scruton advises on the necessity of turning from an ontology of the musical work to one of music in general. However, all this jeopardises neither Ingarden's nor Goehr's contributions. In summary, the different philosophical searches, i.e. analytic, phenomenological, and historical approaches were taken into account. The next step, on the ontology of time and musical time, will follow the same plural methodology.

The inquiry on musical time, despite the circumscribed illustration in chapter 5, does not cover just Western classical music, mainly understood in terms of 'works'. It aims to open this perspective to other music of the world. This is a reason for developing an ontology of music instead of works. Secondly, the ontological study of music will reveal the primacy of the study of time in music. The question about what music is cannot be separated from what is connected with that of what its primary dimension is.

Many authors wrote about the ontology of music, but only few of them presented it as an ontology-of-music as such. Roger Scruton, in his *Aesthetics of Music*<sup>241</sup> wrote about ontology of music in the proper sense. Also Erik Christensen, in *The Musical Timespace*<sup>242</sup> opens the view presented by Scruton, in the sense of extending Scruton's thesis of a metaphorical space in relation to musical meaning to a more global concept

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<sup>240</sup> Ibid., p. 117.

<sup>241</sup> Ibid., pp. 1–96.

<sup>242</sup> Christensen, 1996, pp. 19–21.

of timespace. Ultimately, a modern manual of acoustics by Juan Roederer<sup>243</sup> presents considerations coming from physics, psychophysics, and neuropsychology in relation to sound and music and shed light from a scientific perspective.

Sound is basically conceived either from physical (including psychophysical and neuropsychological) or philosophical (including phenomenological and metaphysical) points of view. The first position considers the reality of sounds materially; the latter, seeks for the appearances or illusions created by sounds, which are nevertheless well founded and not unreal according to an intersubjective understanding. The former speak about vibrations, waves, energy, elastic medium, pressure; the latter about the notions of space and time.

Several definitions of sound seem to add a partial truth; phenomenological, physical, and cognitive considerations must be afforded in order to have a complete view. For Scruton “[t]o hear a sound as music is not merely to hear it, but also to order it”:<sup>244</sup>

[T]here is a phenomenal space of tones. It is modelled on the phenomenal space of everyday perception—the space in terms of which we orientate ourselves. It has ‘up’ and ‘down’, height and depth; its single dimension is understood not only geometrically but also in terms of effort and motion, attraction and repulsion, heaviness and lightness.<sup>245</sup>

According to a scientific perspective physical intensity is the fundamental dimension of sound:

[T]he listening dimensions of timbre, pitch height, pulse and movement are different temporal sub-areas, segregated from the total energy spectrum of the physical intensity continuum by the process of auditory perception [...].<sup>246</sup>

A more recent explanation of the nature of sound comes from a cognitive understanding:

‘[M]usic is a natural subproduct of the human language evolution. In this evolution, that undoubtedly *was* an essential factor for the development of the human race, began to form a nervous chain capable of doing ultracomplex operations of processing, analysis, nesting and recovery of sonorous information necessary for the phonetic recognition, voice identification and comprehension of language.<sup>247</sup>

As we gather all the approaches we go substantially deeper, from phenomenological, passing through physical, and down to a cognitive understanding of the topic.

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<sup>243</sup> Roederer, *Acústica y Psicoacústica de la Música*, 1997.

<sup>244</sup> Scruton, 1997, p. 18.

<sup>245</sup> *Ibid.*, p. 75.

<sup>246</sup> Christensen, 1996, p. 21.

<sup>247</sup> Roederer, 1997, p. 22. Author's translation.

The bridge from sound to organised tone is the first subject Scruton deals with in his book, especially in Chapters 1 and 2. He proposes that the passage from sound to tone is the key for understanding musical experience, and also that the experience of tone is spatial, although in terms of a metaphorical space. Susanne Langer defended the idea that music evoked primarily a virtual time. On the other hand, Christensen, bases his work on the fundamental listening dimensions of intensity, space, timbre, pitch, movement, and pulse as having their source in the temporal continuum. Moreover, Christensen finds the ontology of music in a complex *timespace*, he is not limited to the idea of a virtual space as evoked by music but approaches musical created times as well.<sup>248</sup> Roederer, stemming from the point of view of physics, equally speaks about the necessary temporality of sounds, the neurological source of both temporal and spatial dimensions of listening, and finally, about the conception of music as a subproduct of the evolution on language related skills, conditioned by both biological and cultural factors.

In Scruton's view, sounds are not analysed in their acoustical nature but mainly in their phenomenological nature. Two notions crucial for his view are that sounds are 'secondary objects' and also 'pure events'. Firstly, sounds are not secondary qualities, as a colour may be said of an object. Instead, objects emit sounds and it is not needed to identify their source for them to be heard as such. The 'acousmatic experience of sound'—here he recalls Murray Schafer's (1933) work—implies sounds are neither substance in the Aristotelian sense, or physical phenomena. It is not possible to encounter them, since they do not occupy any place. Moreover, they are not merely mental, private objects either. A community of listeners can agree regarding their existence or not.

In consequence, sounds are 'well-founded phenomena' according to Scruton, an *appearance* that is also real. Moreover, sounds, instead of being properties, are themselves bearers of auditory properties such as pitch, timbre, tempo, and so on. Finally, Scruton defines them as 'secondary objects', in that they are something attested to in a phenomenological but not just physical way.

From the point of view of physics, sounds are explained as changes occurring to the primary properties of things, causing systematic effects in the perceptual experience of normal people—i.e., vibrations propagated through the air that reach our sense of hearing. But in general, aesthetics is interested in appearances and not in the primary structure of things, that is, about the world as it is encountered in our experience.

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<sup>248</sup> Note the profound coincidences of this approach with that revisited in Ch. 1 by Padilla, inspired in Boulez.

Phenomenological appearances, however, can still deserve objective judgements and the presence of a sound is established by how things sound to the normal observer.

A second problem pointed out by Scruton, concerning the nature of a sound, is that we do not have clear identity conditions for them. He puts forward the following example: the sound of a middle C played by the clarinet and by the oboe. Unless we are interested in matters of orchestration, in which case we would perceive them as different, they are going to be identified as the ‘same again’. He compares the situation with ordinary language in which words are identified as types and tokens. In the case of language, the token utterance is presented as an individual, whose properties are to be divided into those which belong to the type, and those which are merely ‘accidents’ of the token.

Here comes a further and especially interesting question, which is presented by Scruton as the core for the definition of sound. And he propounds again an example: the case of the ‘Ford Cortina’, whose tokens are individual physical objects, this, in comparison with sound, which lasts for a certain time and then vanishes without any remnant. This means, that sounds’ spatial properties are indeterminate and vague and even temporal properties are unclear unless fixed by convention.

Regarding its fluid nature, sounds are either events or processes. Both events and processes *occur*. But only processes endure. Events *happen* at time, processes *last* through time. An event marks a change in the world; a process may last unchangingly. Actions seem to include both events and processes. While all sounds are events, some are also processes. *Events* are then fundamental items in Scruton’s ontology.

However, there is a problem about the individuation and identity of events. Our world is made of substances; events and processes are what happen to those substances. Some philosophers, remembers Scruton, reverse this, like Alfred Whitehead (1861–1947), who regard substances as participants in processes and process itself as the fundamental reality; the result of this, according to Scruton, is a philosophy without individuals, lost in a sea of happenings.<sup>249</sup>

With the ontological priority of substances, persons and material objects, as Peter Strawson (1919–2006) postulated it in his *Individuals* (1959) granted by Scruton, we can live with a fluid concept of the identity of events and processes. We can describe many events as our interests determine, simply identifying the individuals and saying what happened to them.<sup>250</sup>

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<sup>249</sup> Scruton, 1997, p. 10.

<sup>250</sup> Id.

Our world-view rests on three applications of the concept of identity: to abstract particulars (like numbers), to concrete individuals (like tables, animals, and people), and to natural kinds (like the lion, the oak tree, or chlorine). Now then, abstract particulars lie outside time and concrete individuals are situated in the stream of time. Criteria for identity across time then seem to acquire their authority from the identity of kinds, and it is because we sort the world into kinds that we can re-identify its individual occupants, according to Strawson. "It seems then that the concept of identity owes its importance to our unending, hopeless, but necessary struggle against the flow of time".<sup>251</sup> After all this metaphysical discussion, for Scruton to deploy a strict criterion of event-identity is to sacrifice becoming to being.

But still there is a difference in the case of 'musical events' that should be presented here: in the case of a car crash the event is identified through its participants; in the case of sounds, we are presented with *pure events*. In this case, the thing that produces the sound is not the intentional object of hearing but just its source. Our intention is found in the pure sound itself. Moreover, sound events take time. Being pure events, their temporal order is the basic order that they exhibit. Then it is through temporal divisions that we decompose them into parts: 'before', 'after', and 'simultaneous' define the position of sounds in the acousmatic world.<sup>252</sup>

Scruton continues enumerating the qualities of sounds that have already been defined as secondary objects as well as pure events. One of them is that no sound can be opaque.<sup>253</sup> This means, if no sound is loud enough to cancel the presence of others, one may be able to hear all the contents of an acousmatic world 'x' simultaneously.

In addition, the world of sounds is metaphysically distinct from us; it contains pure events and processes, no persons or other substances. Here would lie, according to Scruton, the flaw in Strawson's experiment of possibly distinguishing the being and seeming inside a pure sound world in the second chapter of *Individuals*; for the observer cannot exist in that world of sounds, nor out of it.

At the same time, one is tempted to say that the sound world has a spatial or quasi-spatial order. Strawson made an attempt to construct the argument from Kant's idea of space in the *Transcendental Aesthetics* of his *Critique of Pure Reason* (1781), as the form of the outer sense. He stated that we cannot perceive something as existing objectively without situating it in a spatial frame. For Scruton, the essential feature of a spatial dimension is that it contains places, which can be occupied by things and

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<sup>251</sup> Ibid., p. 11.

<sup>252</sup> Ibid., p. 12.

<sup>253</sup> Ibid., p. 13.

between which things can move. And sounds may be arranged on the pitch spectrum *as if* it were a dimension, but no sound can move from one place on that spectrum to another without changing in a fundamental aspect. According to Scruton, far from confirming Kant's thesis, the acousmatic experience offers a world of objects that are ordered in space only apparently and not in fact. Beyond the extended use of 'up' and 'down', 'higher' and 'lower', they indicate only the existence of a continuum but not that of a dimension. And it is not a mere continuum; it has salient points and thresholds.

At this point Scruton asks what distinguishes the sound of music. His answer is 'organization'. Music is not a natural kind but a transformation of sounds into *tones*. And it seems that only rational beings, blessed with imagination, can hear sounds as tones. This is comparable to the transformation of a sound into a word: at that moment I hear language, i.e. an experience of meaning.

Tone is then constructed by a transformation that makes it an experience of meaning. This transformation consists of the organization of the variables of pitch, rhythm, melody, and harmony (just considering the traditional ones). Acoustical and musical events are however identical, they constitute one reality that we conceptualize in two ways. But at the same time we cannot pass from one to the other in that each is autonomous; when sound has been heard as music it has ceased to be sound.

Scruton ends by saying music presents us not with the nature of space but of time. There is no real space of sounds but there is a phenomenal space of tones. It is modelled on the phenomenal space of everyday perception. Yet we cannot advance from this phenomenal space to an objective spatial order. The topological character of space, as a system of places and surfaces, is not reproduced in the acousmatic realm. In that realm we confront only a succession of events, ordered in time but not in space, and retaining the directionality and placelessness which are the marks of temporal dimension.

In the acousmatic realm, temporal order is dissolved and reconstituted as a phenomenal space. We transfer the familiarity and the sense of freedom which characterize our experience of spatial order. For a while it seems like we can wander in time. Scruton thinks that music is not bound to time's arrow, but lingers by the way, takes backward steps, skips ahead, and sets the pace that *it* requires.

The spatializing of the temporal order is also a release from it, says Scruton:<sup>254</sup> we are granted a sensuous intimation of something we can only grasp in thought, namely an order outside time and change. Granted all this, it may be an exception but not a

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<sup>254</sup> Ibid., pp. 73–77.

frequent experience with musical time, since there are cases where the composer wants to show the unstoppable flow of time.

Virtual time is connected to the moving image of eternity in Plato, as Scruton points out. But here there is something wrong with Scruton's argument. This moving image is precisely 'moving', correcting Scruton, who attempted to say that virtual musical time would be comparable to the 'image of eternity' being 'spatial'. In this case it would be the image of eternity, not in Plato's sense, but in Scruton's new sense: time in which we move freely from one illusory location to another and in which all process is reversible. At this stage, Scruton deviated from Plato's original ideas.

It is tempting to agree with Scruton's theory, except for something that he named but he did not fully emphasize in its importance as essential to the understanding of musical experience: the quasi-temporal array of musical events, is by no means cancelled by the following metaphorical organisation in space, but it has its own weight and shows equally, if not primary, interesting ways of constructing our musical understanding. This thesis provides tools to continue arguing for 'the half' that is lacking here (that which concerns time structures). Suzanne Langer seems to adopt the other side of the contest: that music exemplifies time metaphorically, that music is primarily virtual time.

The claim is that not only that space is phenomenological, but time too. Tone is virtually involved in time as well as in space, so both metaphors are necessary. How should we explain the sensation of a time which stops in music, if not by thinking about the phenomenon of creating this virtual cancellation of movement as it is, as a mere appearance over the normal flow of time, lineal, and one-directional? How about branching time? Would we not explain it as a line instead of this phenomenological appearance of many worlds sounding simultaneously without any common sonorous-matress? And even in relation to our sense of linearity as finiteness, would not perceive the work as a teleological moving, an animated organism, be something that goes beyond the linear objective chain order? This phenomenon was described by Clifton as the difference between time used and time evoked. Maybe we could say that it is a simile which is working here instead of a metaphor, but the point would be the same, as stated by Scruton, to transform in one glance something that is normal for us, to have a new meaning that we know is not real.

The meaning of virtual time in Suzanne Langer's *Feeling and Form* is different to what Scruton tries to make her say. She believed that time was primary instead of space in our encounter with music. Now, both metaphors are necessary or are they naming the same phenomenon differently, so making it an issue over terms? One is inclined to say

they do not mean the same at all and both distinctions are necessary to give an account of different things.

Suzanne Langer's treatment of musical time in *Feeling and Form*, Chapter 7: 'The Image of Time', persuades us on another aspect. Scruton's thesis seems to be much more imbued with Langer's spirit than he shows in his *Aesthetics*, although he finishes saying exactly the contrary to what Langer says, regarding the primary substance of musical understanding. Space is a *secondary illusion*, but it is as virtual as time is:

The primary illusion always determines the 'substance', the real character of an art work, but the possibility of secondary illusions endows it with the richness, elasticity, and wide freedom of creation that make real art so hard to hold in the meshes of a theory.<sup>255</sup>

Again, what Scruton did is the opposite. As Langer said, there is a simulation of physical motion and displacement in music to finally identify the existence of virtual time or music living in the realm of pure duration, parallel to internal time and opposite to clock time; Scruton says that there is a spatial array, but as it is not physical so then it is metaphorical, consequently cancelling the temporal organisation from the realm of tones and music.

This is not however the only amendment that could be made to Scruton's thesis. In Chapter 4 on Music and Logic, I will add to his opinion on the emptiness of the analogies of music and language, the idea that, on the contrary, analogies are not vague enterprises but ones that throw light on the depth of the still metaphorical uses. Indeed, the analogy music-formal language of time, for example, allows mediation between the opposite thesis of semanticity and a-semanticity in music theorising.

Music exemplifies time metaphorically. This means that music expresses time, not as it can be physically or commonly experienced but filtered by a metaphor, 'as if' it were time: it is created time. What time does music express? According to Langer, it is lived time. According to Kramer, it is a mix of lived and measured, which is more sensible. According to this thesis, music expresses ideas of time forged in philosophy and culture.

Could we say that music represents time too? A way of seeing time is that it represents when the composer consciously manipulates musical language so as to convey temporal conceptions. Unlike Langer, she could not allow a thesis like this after her idea of the presentational, unconsummated symbol in music. This last idea is closer to Kramer, who says that music is *meaningful* primarily through time.

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<sup>255</sup> Ibid., p. 117.



Music generally embodies time, and this implies that it both expresses and represents time. It would be the case in which music as intrinsically involved and unfolding in time shows temporal ideas as manifested from its structure (this still can be not even intentionally expected by the composer).

Scruton has spoken on the metaphors of animation, movement, and space that revealed the transformation of sound into tone. And he follows by asking about what a metaphor is. In *Poetics*, he remembers, Aristotle describes metaphor as the deliberate application of a term or phrase to something that belongs to something else.<sup>256</sup> Metaphors are transferred to another context from the central context which gives them their sense. The success of figurative language consists precisely of bringing dissimilar things together, in creating a relation where there was none before. In this case, music would metaphorically exemplify time.

The metaphor cannot be eliminated because it defines the intentional object of the musical experience. If we were to take the metaphor away, we would cease to describe the experience of music. Music belongs uniquely to the intentional sphere and not to the material realm. Music is the intentional object of an experience that only rational beings can have and only through the exercise of imagination. There are tertiary qualities, in that they are not objects of merely sensory perception, but require the rational exercise of imagination.

Studies on the *ontology of the musical work* have overshadowed those of *ontology of music*. Typical questions of the first group are for example what makes A and B the same work, or what are the true performances of a work. The ontology of music, instead, asks more basic questions, such as what is a musical sound and ultimately what is music.

## **2.2. From the Ontology of Time to the Ontology of Musical Time**

An ontology of musical time requires firstly a decision concerning the substance of this time, i.e. an ontology of time<sup>257</sup>: the decision about whether points, intervals, periods, moments, or events conform to this time. Stemming from this primary decision this section will present the three separate aspects or levels of musical time, i.e. music temporal constitution from the temporal continuum, the creation of time or musical virtual time, and of music reflecting a temporal conception.

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<sup>256</sup> *Poetics*, 21, 1457b1-1458a8 p. 2332.

<sup>257</sup> Marsden, 2000, pp. 33–45.

A ‘point’ in the ontology of time is the instant, instantaneous events, or the minimum particles of reality. ‘Periods’ refer to certain portions of time instead, the duration of something happening. Both Richards (*et al.*) and Allen have contributed to either one or other approach, defined by the acceptance or not of the reality of instants. ‘Intervals’, for example, can replace ‘periods’ but as Van Benthem<sup>258</sup> demonstrated, they are composed of points; so, intervals would not be the best word if we wanted to express continuous and dense duration after all. ‘Moments’, on the other hand, would be indivisibly small periods, and it expresses those occasions in which points—which mark clearly the division between states but which do not have duration—do not fulfil the case.<sup>259</sup> For Allen & Hayes, what finally exist are either moments or periods.

‘Events’ presuppose a rather different stand: time will not be a separate thing at all but a word referring to *things* that happen. Time is only expressed in the relation of events to each other. It was Van Benthem who developed this view, following a Leibnizian style<sup>260</sup> concerning the nature of time. Notice that in the sense taken here, from a temporal logic approach, ‘events’ are not instantaneous happenings contrasted to ‘processes’, or not merely so. Scruton contrasted events and processes but he did not advance in any ontology of time, as was the purpose for the present authors.

For computing interests in representation, those different ontologies are chosen according to practical applications. In Marsden’s application, point ontology or structure is suitable for barlines or grace notes, objects that do not have duration; a period ontology, for representing notes, something having a start time and duration; ‘moments’ are useful for representing drum strokes, seemingly working like ‘points’ but needing however duration to be satisfactorily translated.

From a philosophico-logical perspective, we will have to evaluate and take a position for one of them in order to represent temporal conceptions in larger pieces of music, or at a macrotemporal-scale.

The decision point-period could be reproduced in musical terms in principle in the question of meter and rhythm or metric beats and rhythmic groupings. Remembering Lerdahl and Jackendoff’s definitions, a *group* is defined as any segmentation of the music by the listener, beginning with motives, themes, phrases, periods, theme-groups, sections, up to the piece itself. *Meter* is the regular pattern of alternative strong and weak beats that one discerns when hearing a piece.<sup>261</sup>

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<sup>258</sup> Van Benthem, 1983, p. 83.

<sup>259</sup> Marsden, 2000, p. 34.

<sup>260</sup> Or ‘relational’, opposite to an absolute theory of time.

<sup>261</sup> Lerdahl-Jackendoff, *A Generative Theory of Tonal Music*, 1983, p. 12.

Regarding period axiomatization, a new relation is required apart from the ‘earlier-later’ already introduced by a point ontology: that of ‘containment’. Its graphical representation will be  $\hat{<}$ . There is no point containing another point considering a *discrete* texture; however it is essential in order for periods to function for them either to contain or be contained by others, either by divisibility or addition. Containment relation implies transitivity and anti-symmetry:

$$(x \hat{<} y) \wedge (y \hat{<} z) \rightarrow (x \hat{<} z)$$

$$(x \hat{<} y) \rightarrow \sim (y \hat{<} x)$$

Axioms combining precedence and containment are:<sup>262</sup>

$$(x < y) \rightarrow \sim (x \hat{<} y)$$

If one period precedes another, it cannot be contained within the other

$$(x < y) \rightarrow \sim (y \hat{<} x)$$

If one period precedes another, it cannot contain the other

$$(x < y) \wedge (y \hat{<} z) \rightarrow \sim (z < x)$$

If a period precedes any subperiod of another period, then it cannot follow that other period

$$(y < x) \wedge (y \hat{<} z) \rightarrow \sim (x < z)$$

Any period following a subperiod of another period cannot precede that other period

Another axiom would be:

$$(x \hat{<} y) \rightarrow \exists z((z \hat{<} y) \wedge ((z < x) \vee (x < z)))$$

Any period containing a subperiod must be partitioned by that subperiod into at least two subperiods. If  $x$  is a subperiod of  $y$ , then  $y$  must contain another subperiod  $z$  which either precedes or is preceded by  $x$ .

In Lerdahl and Jackendoff’s terms this could be analogous to their concept of *hierarchy* as one of the main characteristics of grouping: a musical motive is heard as inside a theme, a theme as inside theme-groups, a section inside the whole piece. Hierarchical organization can be weakened however with grouping overlaps and elisions (i.e. a cadence at the same time forming part of the beginning of the next phrase) occurring in music. Period ontology of the sort developed in temporal logic also

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<sup>262</sup> These rules are not applicable to circular time since precedence is not contemplated in this ontology and it is symmetric.

implies overlapping, as is stated by the following axiom, which is by the way a more complex axiom than that of point ontology for expressing linearity:

$$(x < y) \vee (y < x) \vee (x \hat{<} y) \vee (y \hat{<} x) \vee \\ \exists a \exists b \exists c ((a \hat{<} x) \wedge (a < y) \wedge (b \hat{<} x) \wedge (b \hat{<} y) \wedge (c \hat{<} y) \wedge (x < c)) \vee \\ \exists a \exists b \exists c ((a \hat{<} y) \wedge (a < x) \wedge (b \hat{<} y) \wedge (b \hat{<} x) \wedge (c \hat{<} x) \wedge (y < c)) \vee \\ (x = y)$$

For any two time periods, one must come before the other, or one must contain the other, or one must overlap the beginning of the other, or they must be equal.

The connectedness of linearity is obtained by the axiom:

$$\sim(x = y) \wedge \sim(x \hat{<} y) \wedge \sim(y \hat{<} x) \rightarrow \exists z((x \hat{<} z) \wedge (y \hat{<} z)) \\ (w < x) \wedge (x < y) \wedge (w \hat{<} z) \wedge (y \hat{<} z) \rightarrow (x \hat{<} z)$$

For any two distinct periods not contained one in the other, there must exist a period which contains them both, and all periods between the two periods must also be contained in any period containing those two periods.

Lerdahl and Jackendoff's concept of hierarchy is however operational for their own theory and does hardly admit overlapping: "In a strictly hierarchical organization, a dominating region contains subordinate regions but cannot partially overlap with those regions."<sup>263</sup>

The most important conclusion that can be taken here is that periods function altogether different from points. Overlapping, disjointness, neighborhood, co-start and co-finish are their main relational categories.<sup>264</sup>

In logical terms, translation between points and periods ontology was demonstrated to be possible.<sup>265</sup> In the translation from points to periods in a discrete time texture, periods are sets of points and points the shortest possible periods. But when the texture of time is taken to be dense, however, there are problems, such as the case that periods are infinite sets of points and the definition of being true becomes a definition *during* a set of infinite points. Some extra problems arise as to whether either or both end points are considered as part of the period. On the other hand, when points need to be

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<sup>263</sup> Lerdahl-Jackendoff, 1983, p. 13.

<sup>264</sup> Marsden, 2000, p. 9.

<sup>265</sup> Van Benthem, 1983, pp. 80–124.

considered as periods in a dense time, points in this sense are “fictitious limits corresponding to (maximal) sets of events ‘happening all at once’”.<sup>266</sup>

Marsden had his reasons for avoiding these complexities:

[...]since practical representations cannot be truly dense because of the limitations of computers and other means of representation, these theoretical complexities are of little consequence. The decision between points and periods depends really on questions of the efficiency of representation and processing.<sup>267</sup>

Still it is important to decide whether periods or events are going to be chosen to display an idea of musical time logic. Allen and Hayes defended the position that time is just the projection of the occurrence of events and its properties, an idea that belongs to Van Benthem’s third ontology.<sup>268</sup> In the present thesis, the operational concept is that an event is described as something with musical connotation (a note, a rhythm, a harmonical construction, a silence) happening in time. According to Marsden, passing from an ontology of periods to that of events implies changing questions of the sort: “Does there exist a time period during which both *X* happens and *Y* happens?’ [to that of] ‘Do there exist two events *a* and *b* which coincide in time and which have the properties *X* and *Y* respectively?’”<sup>269</sup>.

An important difference between periods and events, although events share the same relations as periods (overlapping, disjointness, etc.) is that events carry their own specificity: the notion of *simultaneity*. In period ontology this notion is reduced just to *identity* in that they are purely temporal and no intrinsic property is described by them. According to Van Benthem, the most remarkable indeed is the notion of *causality* between events.<sup>270</sup>

In a computational approach<sup>271</sup> events are distinguished by three categories: events with fixed duration (a recording), events with undetermined duration (a *fermata*), and events with no intrinsic duration but whose duration must be specified (for example, notes).

In this special field of computing, a particular process that affects the internal structure of events is when they are made to fit into certain extent of time. This fitting is carried out by three procedures: by clipping (fitting the event to a particular extent, so as

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<sup>266</sup> Ibid., p. 120.

<sup>267</sup> Marsden, 2000, p. 37.

<sup>268</sup> Ibid., p. 39. Also see Casati, Roberto and Varzi, Achille, ‘Events’, *Stanford Encyclopedia of Philosophy*.

<sup>269</sup> Ibid., p. 40.

<sup>270</sup> Van Benthem, 1983, p. 10.

<sup>271</sup> See Marsden, 2000, p. 41.

many as possible components are presented, the remainder being omitted), by stretching (a whole sequence is made to fit into the allotted duration of the event), and cycling (repeating the same event a number of times until completing the duration). Marsden exemplifies these technical proceedings within usual musical practice: the piano key when it is pressed generates a sound that is stopped whenever the damper stops it (clipping); the bowing of the string player will dawn across the string slowly so that it prolongs the necessary note without running out of the bow (stretching); a musician playing a trilled note, will do more alternations the longer the duration (cycling).

Events are going to be understood here as *quasi events* based on Scruton's aesthetics of music. In this thesis events of the following sort are going to be implied. Metric: 'This event has the property of having binary measure', Rhythmic: 'This event has the property of having iambic foot', Melodic: 'This event has the property of oscillating at 440 Hz', Harmonic: 'This event has the property of sounding at 1:2 proportion (Perfect 8ve)'. These musical events can have extra properties added to their main properties of being melodic, rhythmic, and so on. Added properties of musical *quasi events* are typically timbral and accentual (as Seeger understood them).<sup>272</sup> Descriptions of dynamics ('an *mf* event') and tempo ('an *accelerando* event') will also be considered as defining musical events.

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<sup>272</sup> Seeger, Charles, "On the Moods of a Music Logic," 1960, p. 236.

Symbolization, then, is to be judged fundamentally by how well it serves the cognitive purpose: by the delicacy of its discriminations and the aptness of its allusions; by the way it works in grasping, exploring, and informing the world; by how it analyzes, sorts, orders, and organizes; by how it participates in making, manipulation, retention, and transformation of knowledge.<sup>273</sup>

Nelson Goodman

### **3. Philosophy of Musical Language**

The problem about the connection between logic and music is associated with the different results both activities pursue: (classical) logic comes from the idealisation of natural language, and its goal is to arrive at a correct argumentation; meanwhile for music, the principal aim resides in its aesthetic commitment. As logic has its roots in natural language, first it is necessary to explore similarities and differences between language and music, for a posterior delimitation of the idea of a *musical logic*.

The motivation for such an exploration is that temporal logic consists of systematising inferences involving temporalised propositions (e.g. 'Peter was at school', PA). The question is whether music can be revealed via analogue materials, that is, for example, grammatical tenses, in order to speak about a temporal logic in music in strict terms. Even if the answer is no, this does not preclude the development of a *sui generis* musical temporal logic helped by selected tools of this branch of logic, nor the strict application of temporal logic to the musical realm.

The question of signification or meaning in music, in this case via time ideas, requires the study of a position around the topic of music and language. It should firstly answer the questions of what the historical relationships between them were, and secondly, whether music is language in an analytical sense. Music has been dependent on language from early on; at the same time it came to be considered a 'language' in its own terms. In this last context, philosophies of language provide a framework to decide a notion of music as language.

The relation of music with language can be found explicitly formulated for the first time in the Baroque<sup>274</sup>, in the use of rhetorical classical forms as a framework for inventing, structuring, embellishing, and even delivering music. From this point onwards, other aspects are crucial for understanding the sustained exchange between

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<sup>273</sup> Goodman, 1968, p. 258.

<sup>274</sup> Blake W., et al. "Rhetoric and music." *Grove Music Online*.

music and language: linguistic contents were imitated by music in different ways—‘word painting’, imitation music—, the model of literary narrativity was assimilated<sup>275</sup>, and a similar sense of abstraction was reached.

According to Scruton, whether music is a language or not will strictly depend on finding identical conditions that language needs to be called as such: substitution rules, transformation rules, syntax linked to a semantic goal.<sup>276</sup> Here, different theories of signification in the philosophy of language should be presented in order to test their results in relation to the problem of musical signification. The vision of music as language will vary depending on the notion of language one is considering, such as the picture theory of language, semantic-oriented, or the theory of language as expressive, pragmatic-oriented.<sup>277</sup>

### 3. 1. Music and Language in History

The antique divisions of the Greco-Roman tradition of rhetorics, *inventio* (finding the argument), *dispositio* (arrangement of the argument), *elocutio* or *decoratio* (style and ornamentation), *memoria* (memory), and *pronuntiatio* (delivery), were adopted in the Baroque—unless it can be dated as beginning at the early sixteenth century—as the grounds for a theory of music, the situation even extending until the eighteenth century. Consequently, the maximum goal of rhetorics, the persuasion by means of the stirring of emotions, was also transported to music. Although traditionally some aspects of rhetorics were more developed, such as the *dispositio* and *decoratio*, the resonance of rhetorics in music was complete.<sup>278</sup>

Johann David Heinichen’s (1683–1729) *Der General-Bass in der Composition* (1728) includes, among other information, important clues for understanding the theory and practice of composition in relation to the concept of ‘affect’.<sup>279</sup> Heinichen exhorts his readers to search for the affect of words in the *inventio*. To invent, orators had resources that helped them to generate ideas, the *loci topici* (sources of arguments). Common *loci* were those of cause, place, time, manner, and means, but the classifications increased in complexity as time went by. The *locus circumstantiarum* (of

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<sup>275</sup> Tarasti, Eero, 1994, pp. 138–180, narrativity in Chopin. Tarasti, Eero, 2002, pp. 112–115, narrativity in Sibelius.

<sup>276</sup> Scruton, 1997, pp. 174 and 177.

<sup>277</sup> Levinson, Jerrold, “Musical Thinking”, 2003:

<http://www.musicandmeaning.net/issues/showArticle.php?artID=1.2>

<sup>278</sup> Blake Wilson, et al. "Rhetoric and music." *Grove Music Online*.

<sup>279</sup> Buelow, George J., “The Loci Topici and Affect in late baroque Music: Heinichen’s practical Demonstration”, *The Music Review*, 1966.



circumstance) for example, which proposed the use of a textual antecedent, concomitant, and consequent, was mentioned by Heinichen as the source for finding musical ideas in texts of arias consisting respectively of a preceding *recitative*, section A of an aria and section B, or eventually a following *recitative*.

Heinichen's treatise taught how to find a way of inventing musical ideas even in cases where the texts were obscure regarding a certain emotion, by searching in their antecedents, concomitants, and consequences. For example, he shows how an emotion could be extracted from the *recitative* in the search for the correct music for the section A of an aria, whenever the composer could not find anything as inspiration in that part of the text. Examples of affects musically exemplified in the treatise are: 'quarrelsome', 'heroic resolution', 'eternal pursuit of fortune', 'fickle fortune', 'ever-changing or calamity-bearing fortune', 'burning fire of love', 'flirtatious', 'anxiously seeks after his beloved', 'corresponding emotions', 'bantering ideas'.

The *exordium-medium-finis* form adopted for music came also from the antique full structure of the *dispositio*: *exordium* (introduction), *narratio* (statement of facts or thesis), *propositio* (brief summary of what one is about to speak on), *confirmatio* (main body of the speech where one offers logical arguments as proof), *confutatio* (devoted to answering the counterarguments of one's opponent), and *conclusio* or *peroratio* (conclusion).<sup>280</sup>

Likewise, the use of mnemonic aids as early notation and the Guidonian hand attributed to Guido d'Arezzo, paralleled rhetorical techniques of memory and delivery or performance of 'pictorial scripts' stored in memory. According to these techniques in music, standard melodic, rhythmic, and harmonic figures could be retained and composed in the singer's mind.

Those aspects in language considered as musical phenomena belonged to the *pronunciatio*.<sup>281</sup> It was the division of rhetorics dedicated to the variations of tone in speech; it concerned timbral colors, but also gestures. Matching the gesture and the affect to be represented was also important for this part of rhetoric. *Pronunciatio* was linked also to dynamics: the raising and the lowering (volume) of the voice to captivate the audience. It dealt with variety in the use of pauses, to prevent monotony in the speech. Likewise, as music was a constitutive part of speech, speech was for music. Treatises of the time state that the affect of the text had to be respected by the music.

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<sup>280</sup> Fernández, Eduardo, 2003. For an antecedent see Burmeister, Joachim (1566–1629), *Musica Poetica*, 1606.

<sup>281</sup> Borgerding, Todd, "Preachers, *Pronunciatio*, and Music: Hearing Rhetoric in Renaissance Sacred Polyphony", *The Musical Quarterly*, 1998.

This can be seen in the motet genre, e.g. Orlando di Lasso's (1532–1594), *In me transierunt*, but also in sixteenth century polyphony in general.

The interrelation of music and rhetoric was at first discovered in the development of a musical *decoratio*. Orators had the diverse figures of speech for the embellishment of their discourses; musicians invented the musical figures. In sum, they could be described in general as figures of melodic repetition, figures based on fugal imitation, figures formed by dissonant structures, interval figures, hypotyposis figures ('word-painting'), sound figures, and figures formed by silence, anadiplosis<sup>282</sup>. They were devices proposed as analytical tools for understanding the polyphony of the late Renaissance, as demonstrated by Burmeister's treatise.

The musical commerce with rhetoric led finally to the prosecution of affects as its most significant aesthetic goal. An 'Affekt' (German), from the Greek 'pathos' and the Latin 'affectus', consisted of a rationalised emotional state or passion, e.g. sadness or joy. The Baroque composer would plan the work, pairing each element to a very determined affect that had to be interpreted in the same way by the listeners—contrary to what happen in the 19<sup>th</sup> century where the emotions were spontaneously represented and interpreted. The theory of the affects or 'Affektenlehre' however did not imply a comprehensive, organised theory of how these affects were to be achieved in music.

There is a fundamental debate between rhetoricians and musical semioticians. Rubén López Cano answers to Brian Vickers' classical article entitled 'Figures of Rhetoric/Figures of Music?',<sup>283</sup> where Vickers rejects the possibility of seriously applying the rhetorical apparatus to music. Despite the historical fact that music took from rhetorics its categories and the birth of the opera was going to crystallise these achievements, Vickers shows analytically that it is impossible to pass from an aesthetical verbal system to one which is not, such as music. He invites us to think for example of the case of the hyperbaton, dislocation of the logical grammatical structure of the phrase.<sup>284</sup> It is impossible for music to generate the degree of deviation offered by language with the same intensity, since its norms do not work under strong convention. There are also other problematic examples to consider, such as euphemism or paradox.

For Vickers, there was a simplification in the translation of rhetorics to music. Music cannot translate the *modus operandi* of rhetorics. Musical figures are like formal

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<sup>282</sup> Figure of repetition in which a word that ends a line is repeated for emphasis at the beginning of next line. Musically it is reinterpreted as the repetition of a motive which ends a phrase at the beginning of the next phrase.

<sup>283</sup> Vickers, Brian, "Figures of Rhetoric/Figures of Music?", *Rhetorica*, 1984.

<sup>284</sup> "Pasos de un peregrino son errante / cuantos me dictó versos dulce Musa / en soledad confusa, / perdidos unos, otros inspirados" (Luis de Góngora, *Soledades*, 1613).

amendments of rhetorical figures and cannot reproduce the functions over a semantic level. In this sense, music is more vague, diffuse, and general. Secondly, music can neither produce the same effects of emotional states, nor convey the complete dimension of its significance with the precision language does. Finally, semantic connotations in music are reduced to mere structural analogies and he remembers here precisely the idea of the musical ‘unconsummated symbol’ of Susanne Langer<sup>285</sup>.

What is true is that the adaptation from literary figures showed a process of ‘taking which is useful’ for music. In fact, the comparison between musical and rhetorical figures yields similarities, but also differences and even some original musical figures that do not appear in rhetorics. What deserves discussion from now on is the question of whether this kind of approach gives us a clue for comprehending the music analysed, or not.

López Cano’s proposal is that this situation does not invalidate the use of rhetorics, although with the known caveats.<sup>286</sup> He defends the idea of rhetorics as a major discipline, but the theory of musical rhetorics in the Baroque would be only an early stage or a ‘rhetoric of transition’. He states:

Rhetorics is not in the text. Rhetoric does not underlie in the immanent configuration of the text or in its linguistic substance. Rhetorics is a metalanguage rising over it. The rhetorical discourse is a construction, helpful for the work of producers and analysts of discourse. The rhetorical apparatus, although expressed through verbal means, does not belong to the same epistemological level of its object-language [...] It is at this level of the meta-language, that the rhetorical apparatus moves into *musicological categories* (but not musical ones).<sup>287</sup>

The conclusion is of an important dimension in relation to the one explored by the project of finding a musical temporal logic. López Cano reformulates the primary question Vickers used as title of his article and instead of asking whether figures of rhetoric were in fact figures of music; he rewrites:

[I]n what measure can the metalanguage developed for studying *certain phenomena* of verbal systems be applied to *similar phenomena* of non-verbal nature? What adaptations and adjustments does the metalanguage withstand when required by another object-language?<sup>288</sup>

López Cano, ‘in defense of rhetorics’ but now of music, remembers contemporary semiotics, studying actually the semantics of music. Emotional repercussions of music are a fact. If musical experiences cannot be put into words this does not mean that any

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<sup>285</sup> Langer, 1942, p. 232.

<sup>286</sup> López Cano, Rubén, *Ars Musicandi: la posibilidad de una retórica musical desde una perspectiva intersemiótica*: <http://www.geocities.com/lopezcano/index.html>

<sup>287</sup> Author’s translation.

<sup>288</sup> Id.

semantics could be deduced from music. Moreover, there are two kinds of references in music: extrinsic and intrinsic—given by its implicit reference to time. He notes here that for rhetorics, language is not literal either, and that the same ambiguity of signification is present in language, situation which is the core of literature.

Todd Borgerding gives an alternative to the problem of the legitimacy of crossing borders between music and literature. If rhetorics in music were criticised for the vagueness of its translation, the emphasis on aspects of pronunciation in ecclesiastic rhetorics would provide an exchange that would moderate matters. Borgerding bases his arguments on Luís de Granada's *Rhetorica ecclesiastic* (1572), showing how the indications of pronunciation by preachers are useful to discover a musical oratory in vocal polyphony.

[There is] a tradition of listening that informed both musicians and orators during the sixteenth century. [Notwithstanding], a more complete analysis might return to Burmeister's treatment and explore the way that pronunciation intersects with the use of figures and tropes.<sup>289</sup>

Through the emphasis on aspects of pronunciation, one would pass from mere analogies of the visual construction of figures, to acoustic, heard analogies, more important for the art in question.

Peter Hoyt explains how with the Enlightenment (18<sup>th</sup> century) the florid discourse of rhetoric became undermined by the clearness of the informative discourse, which led to progress.<sup>290</sup> Moreover, rhetoric became an utilitarian art in comparison to those pure arts such as music, poetry, painting, sculpture, and dance. In this context, the association music-rhetoric would take another meaning.

The stereotyped way of associating objectively one figure to one affect was increasingly felt to be unnatural. On the contrary, passions were believed to be unique and individually experienced. This new atmosphere led to Romanticism in music. Figures were regarded as entirely subjective and highly personal. Each piece reflected the inner character of its composer, and the formulaic *loci topici* that once aided the invention became superfluous. Music came to be seen as a true universal language superseding speech, which was merely conventional and therefore arbitrary. The pre-eminence of music among the arts was characteristic of the period.

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<sup>289</sup> Borgerding, 1998, p. 595.

<sup>290</sup> Blake, "Rhetoric and music", *Grove Music Online*.

Programmatic works of the Romantic period owed little to the *ars oratoria*. ‘Programme music’<sup>291</sup> was a term invented by Franz Liszt (1811–1886) for music of a descriptive or narrative kind; but the term also extended to all music that attempted to represent extra-musical concepts without text, and became traditionally opposed to ‘absolute music’.

Scruton distinguishes three different versions of programme music: 1) ‘imitation’ music (which would not be strictly speaking ‘programmatic’ in Liszt terms), of which an example could be Clément Janequin's (1485–1558) *chanson* ‘La bataille’; 2) ‘narrative’ music, that is, the programmatic music developed in the Romanticism, especially by Liszt (e.g. *Tasso*); and finally, 3) ‘symbolic’, which is the last kind of programme music, developed in the Impressionism, notably by Debussy (e.g. *La Cathédral engloutie*). Here the narrative programme became as blurred as were the traditional tonal progressions. Note the delicacy of cases of cross-fertilization with painting or poetry; the sole ‘inspiration’ of music in these sources does not suffice to make music programmatic. A certain musical idea is implicit that develops and traces a story.

Hector Berlioz (1803–1869) introduced the device of the *Idée fixe*, a melody representative of a character or feeling, which reappears in a variety of forms and develops with the changing circumstances. This led to the Wagnerian *leitmotif*, a theme that is associated with a character, a circumstance, or an idea, and which develops sometimes out of all recognition in order to convey the evolution of its narrative idea. It was primarily through the leitmotif that music became able to emulate the descriptive nature of language and Liszt was able to approach his ideal of a music that could not be understood even as music unless the correct poetic conception was invoked in the listener.

Liszt created the ‘symphonic poem’, as he wanted to suggest more the emotional reality of things than to depict any content, to express more than represent. He proposed a new organisation distinct from that of the traditional symphonic forms; the programme music of the symphonic poem would derive from the subject it attempts to describe. The difference with imitation music, the first type of programme music described, is that here the material follows the events of a narration. Liszt’s symphonic poem *Tasso*, for example, follows the events of Tasso’s life.

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<sup>291</sup> Scruton, “Programme Music”, *Grove Music Online*.

‘Absolute music’<sup>292</sup> on the contrary, is considered pure as it is not subordinated to words, or drama, or any representational meaning or emotional expression. Absolute music is music that has no external reference, to the extreme of neglecting not only any reference to external objects but also any expressive content. This latter idea is the most problematic.

Absolute music could be described positively as music that is pure form, according to internal canons, and autonomous of any extramusical reference. Objectivity and structure were the terms used to define such type of music. Paul Hindemith (1895–1963), Igor Stravinsky, and the followers of Arnold Schoenberg (1874–1951) believed that music was essentially a structural art. In the domain of theory, Heinrich Schenker (1868–1935), with his structural analysis, demonstrated this claimed autonomy of music. According to Schenker, there is a main structure (original, germinal) in tonal music, which needs to be uncovered from the whole piece in order to comprehend its ultimate meaning.

Roger Scruton wrote on the relative autonomy of music, a moderate point of view:<sup>293</sup>

The advocacy of absolute music has brought with it a view of musical understanding that is as questionable as anything written by Liszt in defence of the symphonic poem. It is of course absurd to suppose that one understands Smetana’s *Vltava* primarily by understanding what it ‘means’. For that seems to imply that the grasp of the melody, development, harmony and musical relations are all subordinate to a message that could have been expressed as well in words. But so too is it absurd to suppose that one has understood a Bach fugue when one has a grasp of all the structural relations that exist among its parts. The understanding listener is not a computer. The logic of Bach’s fugues must be heard: it is understood in experience and not in thought. And why should not the musical experience embrace feeling and evocation just as much as pure structured sound?<sup>294</sup>

Entering into the Romantic period obliges us to enter into the study of expression. In fact, Romanticism ends with the old aesthetic theory found in Aristotle, that of art as imitation of nature, that was current until 1800. As it was seen, rhetoric constituted the method in music by means of which passions were imitated. But in 1800 the expressive power of music is emphasised over the imitative. From the resemblance of passions to the expression of passions there is merely the same difference as between imitation and interpretation.

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<sup>292</sup> It is well established however that “[T]he term ‘absolute music’ denotes not so much an agreed idea as an aesthetic problem”. Scruton, “Absolute music.” *Grove Music Online*.

<sup>293</sup> Also Padilla, 1995, pp. 57–58.

<sup>294</sup> Id.

Music was not imitative anymore but analogous of the emotions, a language independent of the others. The theory of the meta-feelings appeared in this context, according to which one aesthetic sensation can arise many different feelings but none in particular. These ideas fed the 19<sup>th</sup> century idealistic view of music.

The non-representational character of music that was for the Enlightenment cause for its discredit among the arts (Kant's *Critique of Judgment*, 1790), was now the reason for its elevated status over the rest of the artistic disciplines. Music could go beyond the limits of rational knowledge, had an infinite potentiality, and could describe indefinable feelings, leading up to mystical revelations.

Schopenhauer developed this idealist thinking about music within a systematic philosophy. In *The World as Will and Representation* writes that music is the direct expression of the Will. For Schopenhauer, the world is *representation*, appearances guided by causality. But the underlying principle sustaining the world is the *Will*. And the passage from the world of representations or appearances to that of the Will or Absolute comes from the self-experience of the Will. The impulse of the Will is irrational. The Will is one; representation is plural, however, there are intermediate genres that join representations: Ideas. The contemplation of the ideas emancipates human beings from the pain caused by the Will, always unsatisfied. Within this context, consciousness, in this sense, is what at the same time discovers the dissatisfaction and the path of suppression of dissatisfaction.<sup>295</sup>

According to Schopenhauer's philosophy, the disinterested contemplation of the ideas is an act of artistic geniality. The artist by contemplating the ideas dominates the Will. Music is, in the scale of the arts, the maximum revelation of the Will, far from spatial representation. It is the revelation of the emotions without the object that produced them, pure abstraction of pain and joy, and liberation of the Will through its serene vision and domain. The passage from art to the knowledge of oneself constitutes the last stage of Schopenhauer's philosophy, imbued by the notion of the Buddhist *nirvana*, the negation of the individual and the immersion in nothingness.

This vision tips over into the Formalism developed by Hanslick in *Vom Musikalisch-Schönen* (1854)<sup>296</sup>, often seen as the opposite of idealism. Hanslick criticised a theory of expression which led to the belief that music expressed something outside of itself. Music expresses nothing but itself, the shaping of the musical idea itself. Hanslick refutes the expressionist theory of music, arguing that music traces the dynamic motion

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<sup>295</sup> Katz-Dahlhaus, Vol. 1, 1987: Schopenhauer, *The World as Will and Representation*, Vol. 1, §52, p. 148. Also Schopenhauer, 1969, *The World as Will and Representation*, Vol. II, Ch. XXXIX, p. 447.

<sup>296</sup> Hanslick, 1986, Ch. III, pp. 28–29.

of feelings and this is not the same as expressing an indefinite emotion, for to represent an emotion is a contradiction in terms.

According to Paddison, both Hanslick and Schopenhauer influenced what came after, Impressionism (Symbolism), which can be seen as an extreme refinement of either autonomic or expressive aesthetics.<sup>297</sup> Both influences appear in Expressionism as well, where Schopenhauer's notion of music as the direct expression of the Will is replaced by the Freudian unconscious, a withdrawal into the self in the process of disintegration, at the same time showing formalist implications: extreme abstraction and non-representation.

Stravinsky's *Poétique musicale* (1942) constitutes the following step. He was, jointly with the Darmstadt school, founder of the anti-expression aesthetic. For Stravinsky, music was a certain organisation of time that implied calculus and speculation. "All music is nothing more than a succession of impulses that converge towards a definite point of repose"<sup>298</sup>.

'Formal' music brought the possibility of speaking about an *abstract* music, adjective reserved to be an exclusive characteristic of verbal language. Precisely from this vision of music as pure language, a conception of a musical temporal logic is built, although different from formalist approaches, here an 'enhanced formalism'<sup>299</sup> is proposed in the sense that time ideas provide meaning.

The historical process of the relations between music and language could be summarised in four steps:

1. Music emulates linguistic manners, being associated with rhetorics.
2. Music emulates language in that it can refer to contents outside itself (imitation music).
3. Music emulates the narrative of language ('programme music', but also 'absolute music').
4. Music can reach abstraction, in the sense of being separated from an extrinsic reference and play with its own elements in a formal way.

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<sup>297</sup> Paddison, Max, in Kovaleff Baker, Nancy, *et al.* "Expression." *Grove Music Online*.

<sup>298</sup> Stravinsky, Igor, *Poetics of Music*, 1979, p. 35.

<sup>299</sup> Term used by Alperson, Philip, 2004.



### **3. 2. Music as Language, an Analytical Approach**

In addition to the historical relations music had with language, the conception of music as language deserves an analytical treatment. Roger Scruton presents one in his *Aesthetics of Music* (1997).<sup>300</sup> Scruton asks if an analogy with language or the search for a grammar would cast any light on a theory of musical understanding. His answer is 'no'; the arguments that leads him to such a result will be discussed below.

The general science of signs studied language as one system of signs among others; this was extended to even consider artworks as signs. The association was made from the context of structuralism, which led to the belief that structure and meaning were connected. In music, particularly, the idea was developed to include even the idea of musical 'syntax', which it would have in common with language.

According to Scruton, however, this school does not provide a persuasive theory of syntax, or an explanation of how syntactic structures encode meaning for the following reasons. It is believed that music has a 'paradigmatic' and 'syntagmatic' structure; certain substitutions, but not all, are allowed to fill the free places in a row and every moment of this row limit what is before and what come after, e.g. 12-bar blues. Every chord is taken from a paradigmatic class and constitutes a *syntagma* whenever it can be explained by the rules of grammar. This works for the three musical dimensions of rhythm, melody and harmony.

To reveal if the presence of this kind of structure shows the meaning of music, Scruton takes the opening bars of Claude Debussy's (1862–1918) prelude to his opera *Pelléas et Mélisande* (1898). Semiotic analyses should arrive at a correct description, which justifies the place of the chords in the syntactic structure, showing how they follow from the preceding harmonies and how they condition the harmonies that come after them. He arrives at the conclusion that this example shows that there is more than syntagmatic structure. A person who hears with understanding perceives, at bar 5 of the example, neither a chord in D minor (the flattened fifth of D in this case), which is the key established at the beginning, nor the chord in any other key. In fact, it was written precisely to deny any sense of key, by ruling out the possibility of a dominant using the whole-tone scale.

According to Scruton, the wrongness of assimilating syntactic structures to music resides in the absence of any link between syntax and semantics; whereas in language syntax and semantics goes hand in hand. The meaning of the music is not provided by the syntactic order but by the acoustic sensation provoked by the music.

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<sup>300</sup> Scruton, 1997, pp. 171–210.

‘Syntax’ informs us whether a sentence is a possible sentence of the language, which of its component sounds is a word rather than a phoneme, and how the words are linked. On the other hand, ‘semantics’ tells us whether a sentence has meaning and what the meaning is. Scruton goes on to explain that a theory of syntax would explain how we can derive sentences of the language, by finite transformational rules, from a finite vocabulary and a repertoire of deep structures. We recognise syntactically correct sentences by grasping their derivation; deviant sentences are those that we cannot derive from the repertoire of rules and structures.

Syntax is generative, and not merely consists of ‘rules of substitution’ (*syntagmatic* structures). ‘Transformation rules’ generate surface structures from underlying ‘deep’ structures. Transformation rules explain our ways of grouping words in a sentence; they also explain how we hear the sentence. From the sentence: ‘That he was angry was evident from the way he frowned’, we hear the first ‘was’ less far from ‘angry’ than the second ‘was’. This is because we hear the first clause, a noun phrase, as grouped together.

Scruton shows consequently that our rules of grammar must take into account more than the surface position of a word to generate a natural language. The point is illustrated as well by reflecting on the intransitivity of syntax. A word may be acceptably joined to its successor and the successor to its successor, and the result may be ill formed, e.g. ‘Fish eat three ideas’. This may have a parallel in music. In Hindemith’s *Gebrauchsmusik*, there is an example where each bar leads smoothly into its successor, but the whole is non-sensical.<sup>301</sup> From this situation a consequence can still be derived that there are indeed intuitions of right and wrong that can equally be shown in music.

But for the analogy with functions of language, one should provide a rule-governed syntax for all dimensions of musical organisation that is for rhythm, for melody, and for harmony. Scruton examines a first case in which a metrical pattern is interrupted by a syntactical incorrectness. Then, a second case in which, substituting a falling fourth in a melodic syntactically correct example, we feel the pressure of redefining the other consecutive ‘slots’ in the melody. Similarly with harmony, one could find also a kind of rule-governed order. Given certain melody, a bass-line could be derived directly according to its tonality.

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<sup>301</sup> *Ibid.*, p. 179.

Scruton remarks that these intuitions of right and wrong in music remind us of those which the linguist tries to explain through a transformational grammar. Consequently, he concedes at this point of the analysis the following facts:

- There are infinite utterances in music, but constructed from a finite (discontinuous) vocabulary, i.e. the twelve semitones.
- Music implies a cognitive process in which we pay attention and every element is understood in relation to the whole.
- There is a context-dependent affinity between tones, more than a step-by-step substitution of syntactically equivalent elements. Music is organised, but *sui generis*, through variations, imitations, parallels, and structural and prolonging episodes.
- There is a 'chunking of information' in music; groups of tones, beats, and harmonies are perceived as forming a unit, as words forming a sentence.
- In music, memory plays an important role, aiding the recognition of the structure as a whole.
- And there are in fact intuitions that suggest a 'generative' explanation. How music is heard leads to a hypothesis of how it is derived. In Debussy's example, the chord in measure 5 should be derived from a whole-tone scale (D–E–F#–Ab–Bb–C).

According to Scruton, a generative theory of tonal music should offer the following 'intuitions' as primary evidence:

1. Horizontal grouping into phrases or melodies and vertical grouping into chords.
2. Metrical intuitions.
3. Melodic intuitions, how a melody splits into episodes which elaborate, answer, or continue.
4. Intuitions concerning tension and relaxation or the presence of unsaturated chords requiring a completion.
5. Intuitions concerning the part-whole relationship, episodes either answering each other or being independent.

According to Scruton, with these intuitions we could develop, as a linguist does, a theory that would explain those patterns that sound right and exclude those that sound wrong. It would be a theory of musical understanding *par excellence*; it would show how and what we should understand.

Lerdahl and Jackendoff's *Generative Theory* (1983) distinguishes two kinds of grammatical rules: those that specify when a given complex is well formed ('formation rules') and those that specify the preferred or favored musical structures ('preference rules'). They emphasise however the importance of the second type while they marginalise the concept of 'well-formedness', which is the equivalent to syntax in formal languages.

Lerdahl and Jackendoff propose four structures in tonal music according to grouping, meter, the organisation of pitches according to their structural importance, and the order of tension and release. They constitute hierarchies, which derive perceivable musical phenomena from underlying structures, in the same manner that the word order in a sentence is derived from the deep structure of rules of transformation. The first step in a transformational grammar is the design of trees<sup>302</sup>. They construct similar trees to explain which musical elements are heard as subordinate to which. The analysis has the following layers:

1. The grouping structure: divides the piece into motifs, phrases, and sections hierarchically in a tree diagram.
2. The metrical structure: divides between strong and weak beats at various levels into the grouping structure.
3. The 'time-span reduction': assigns a hierarchy of structural importance to the pitches.
4. A 'prolongation reduction': derives the tension and relaxation of the harmonic and melodic elements hierarchically, from an underlying harmonic and melodic structure (equivalent to the Schenkerian *Ursatz*)<sup>303</sup>.

Each structure is characterised by 'preference rules', rules which, for example, tell about the preference of the event leading to the more stable metrical order, as the most important event (or 'head') in a time-span. The corollary from this enterprise is that there are 'musical universals' and that is innate for humans to recognise them.

According to Scruton, we should hesitate to call this a theory of musical syntax, for the rules do not determine any musical surface uniquely. This is because preference rules can conflict. It is impossible to think of these rules as procedures which one might obey: the listener acts in *accordance* with these rules, but not *from* them.

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<sup>302</sup> Chomsky, Noam, *Knowledge of Language*, 1986.

<sup>303</sup> See Pankhurst, Thomas A. *Schenkerguide.com: A Guide to Schenkerian Analysis*:  
<http://www.schenkerguide.com/html>

By the way, Lerdahl and Jackendoff admit that preference rules have no parallel in natural language because the rules are precisely obeyed in language—at least in normal discourse, but with possible exceptions in literature. The problem of preference rules touches the nature of Lerdahl and Jackendoff’s enterprise, according to Scruton.

Moreover, the reduction acquires a tree structure familiar to generative theories of syntax. The same authors admit also that this is misleading, since linguistic syntactic trees relate grammatical categories, which are absent in music. In music, on the contrary, it is the individual events that are hierarchically related.

The principal question for Scruton is whether a theory of tonal music conceived in cognitive science terms would really show how we understand tonal music. Scruton presents three arguments for diminishing the power of the generative theory in music. Each of the four reductions proposed by the theory offers to explain our experience of sequence: why this sounds right after that. However, he regards counterpoint as just as important. We can affirm for example that a chord heard in the second voice of a canon is right, being knowledge that here is first a matter of musical expectation, and not of derivation.

Likewise, he considers the ‘prolongation reduction’, where a portion of music is derived from its cadence. Scruton notes that we can treat a passage as subordinate to a cadence only because we perceive the temporal *Gestalt*. The basic experiences evolved in hearing music, recognising parallels, movement, and force are not explained by the hierarchical theory of the piece’s structure, but assumed by it. Scruton’s example is Franz Schubert’s (1797–1828) first ‘Suleika’ song (1821). At the beginning, three measures displaying an ambiguous G seventh chord arrive at the dominant F# of B minor in the cadence; the situation he wants to explain is that we *already* hear B minor in the first three measures.) By the way, Lerdahl and Jackendoff also admitted that they could not explain parallelism. He ends: “A prior conception of the musical *Gestalt* is therefore required before the generative theory of prolongation can get off the ground”.<sup>304</sup>

Finally, according to the author, the theory does not mention the key component of the grouping phenomenon: the experience of movement of phrases beginning, moving on, and coming to an end and the experience of metaphorical space in which this movement spreads. Scruton appeals here to his main thesis presented already in Chapter 2:

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<sup>304</sup> Ibid., p. 196.

To notice the movement in music, you must perceive the notes not merely organised into groups, but as moving; and that means perceiving the music under an irreducible metaphor [...]. A generative theory of grouping is necessarily blind to this fact: it can, perhaps, explain the grouping; but it cannot explain the metaphor -nor the fact that *this* is how the music is heard. The crucial component in our understanding of music will therefore not be touched by the theory.<sup>305</sup>

Conceding that Scruton went ahead with a more convincing theory of musical understanding in terms of a 'metaphorical space', and leaving aside here our criticism of the partial ontological point of view he is defending, the works of the structural analysts such as Schenker, and Lerdahl and Jackendoff have offered substantial explanations for the way music is organised. It seems wrong to understand their studies as if they had to replace music itself; analytical explanations suppose fragmentation. It is evident that the explanation will not return us the music and the direct way of experiencing it.

Scruton's claim nevertheless has some legitimacy. Factual demonstrations about our capability to recognise parallels, and the work memory does in expecting and remembering, with the consequent experience of movement, are sufficient to consider it a crucial addendum to these established theories.

Concerning the status of musical rules and the way in which they shape musical practice, Scruton arrives at the following conclusions:

1. The order that we hear in music may be likened to, but it is not, truly syntactical. It resembles the order of style in language, unless it is less independent.
2. There are rules in music but they are not usually prescriptive, they are derived *post facto*; generalisations instead of rules of grammar.
3. There are no parts of speech in music, no syntactic elements playing a single specifiable role. In music, as in language, it is only in the whole context of the utterance that any element has meaning. But in music, unlike language, the contribution is not and cannot be constant.
4. In language, speaker and hearer have the same competence. In music, the composer must have the hearer's competence, but he must also have much more than this if his music is to be meaningful. A generative grammar of tonal music would not tell us how tonal music is composed.
5. Rule-governed music is, in general, vacuous and uninteresting.

As a second stage, Scruton later elaborates another claim (perhaps the stronger one) to criticise Lerdahl and Jackendoff's theory. It is based on the assumption that a

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<sup>305</sup> Ibid., p. 197.

coherent conception of deep structure in natural language is linked to a semantic interpretation of it. Even in formal languages, syntax is modelled on an implicit interpretation. And there is no way in which we could build a theory of language syntax without depending on intuitions about the meaning of words.

This means that music could be described syntactically only if we could propose a musical semantics. The weakness of the semiological approach resides in its inability to combine syntax and semantics into a unitary theory. Music has a quasi-syntactic structure and also a kind of meaning. But there is no reason to believe that its structure is the vehicle of meaning.

According to Scruton, we could still think of music as having a semantic value, only if we could signal the meaning of a piece from the meanings of its elements. We should search for a musical equivalent to a vocabulary—phrases, harmonies, progressions, and so on with a repeatable significance that regularly and predictably contributes to the meaning of the musical whole.

For Scruton, meaning is assigned by *perception*, not by convention in the case of music; a case completely unlike language. And through an example shows how rivalling semantic meanings could be assigned to music (e.g. Schubert's 'Rückblick', *Winterreise*, 1828). Scruton's question is whether the set of phrases and gestures have the same standard meaning for those who are competent to deploy them, regardless of any accompanying text. The absence of parts of speech implies that there are no clear procedures for deriving a semantic interpretation of a whole phrase or movement from the interpretation of its parts. Instead, music simply accumulates meaning without an articulate structure. Expressive meaning is chiefly context dependent and irreducible to laws. The constancy of meaning cannot be assumed, and the process of accumulation changes unpredictably the significance of each 'syntactical' part. He ends: "Who would say that the move from the minor sixth to the dominant in the minor key means the *same* in Alberich's lament [Wagner, *Rheingold*, scene I], and in Mozart's Fortieth Symphony, K. 550 [opening]?"<sup>306</sup> The hypothesis of semantic structure in music as literal truth is for Scruton unsustainable.

The constancy of meaning which is a fact found in tonal tradition must be explained however. The apparent musical vocabulary is the outcome of a long tradition of 'making and matching', and his rules of meaning are really habits of taste.

Following Scruton's arguments, music has neither truly syntactic nor semantic structure. He remembers Nelson Goodman and Suzanne Langer who notably presented

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<sup>306</sup> *Ibid.*, pp. 206–207.

the category of symbol systems without semantic structure, symbols that present their subject matter directly. The intention was to formulate a concept of symbolism that would allow us to speak of music (and other art forms) as signs, while denying that they describe what they signify, as language does.

Scruton arrives at the conclusion that there are no rules that guarantee expression, even if a background of rule-guidedness may be necessary for the highest expressive effects. Rules have a different role from the grammatical rules of language; if you rewrite the rules then you can change the possibilities of expression. All this would lead to the topic of the aesthetic experience. Scruton believes that finally the linguistic analogy in the case of music is more metaphor than simile and although it is not useless, it is anyway not appropriate for founding a theory of musical understanding.

The analyses made by Scruton hide a particular conception of language in his critiques to musical semiotics, which comes from the semantist school of philosophy of language of the 20<sup>th</sup> century. Before leaving this analytical inquiry on music as language, a different notion of language will be approached briefly just to mention another possibility of dealing with the matter.

Levinson's thesis in the article 'Musical Thinking'<sup>307</sup> consists of claiming for music the same association with thought that one usually attributes to language. He begins remembering here how music served the late Wittgenstein for speaking about our deep constitution in language: "Here it is as if a conclusion were being drawn"<sup>308</sup>; "You can point to particular places in a tune by Schubert and say: look, that is the point of this tune, this is where the thought comes to a head"<sup>309</sup>. Again in *Culture and Value*:

If I say for instance: here it's as though a conclusion were being drawn, here as though someone were expressing agreement, or as though this were a reply to what came before,—my understanding of it presupposes my familiarity with conclusions, expressions of agreement, replies.<sup>310</sup>

Music served Wittgenstein to show how language was intertwined in our ways of comprehending the world, as Levinson explains.

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<sup>307</sup> Levinson, 2003.

<sup>308</sup> Wittgenstein, *Philosophical Investigations*, 1953, 182.

<sup>309</sup> Wittgenstein, *Culture and Value*, 1977, 47e.

<sup>310</sup> *Ibid.*, 52e.



Music is [...] inextricably embedded in our form of life, a form of life that is, as it happens, essentially linguistic. Thus music is necessarily apprehended, at least in part, in terms of the language and linguistic practices that define us and our world.<sup>311</sup>

Levinson provides inspiring passages from Wittgenstein's different categories for speaking about music as thoughtful activity:

*[E]mbodied thinking* in music is thinking we ascribe to the *music*, as something it appears to be doing, and has no identifiable object, whereas *implied thinking* in regard to music is thinking we ascribe to the *composer*, and has a quite definite object, namely the evolving composition itself. [...] *[Intrinsic thinking]* may reside instead in the mere succession from chord to chord, motive to motive, or phrase to phrase at every point in any intelligible piece of music, whether or not there is any suggestion of recognisable extramusical action, or any implication of specific compositional deliberation. [...] It is a purposive-seeming, goal-directed temporal process, an intelligent form of continuation in time, and one naturally subject to assessment in cognitive terms, such as 'coherence' or 'logicality' or 'making sense'.

This last category of music as intrinsic thinking has a big impact in the context of the project of a musical temporal logic.

Now, the turn from searching for the question of meaning in language in its semantics to searching for its meaning in pragmatics, means that one is passing from believing that grammar is underlain by reality (the object), to rather a belief that the meaning of language is formed by conventions and practices, such as in the following example: 'Can he *speak?*', whether it is asked of the parents of a child or of the family of an ill person. According to the first period of Wittgenstein's thought, the *Tractatus*, the question would appear mysterious, intangible, abstract; according to the second period, the *Philosophical Investigations*, its significance would be given by its use in an act of communication (the person would be asking if the little child is already able to speak, or whether a patient is in condition to speak).<sup>312</sup>

In music, like language in this particular pragmatic-oriented sense, there is no grammar, no content that has to be deciphered, but outwardly responses and capacities (gestures, apt comparisons, hummings, and movings). In Levinson's own words:

Both music and language are forms of thought. Understanding music should therefore be analogous to understanding language. The former, like the latter, is a matter of *use*, that is, of knowing how to operate with the medium in question in particular communicative games, in particular contexts. But knowing how in regard to music, as with knowing how generally, does not consist in propositional knowledge but rather in behavioral and experiential abilities and dispositions. Hence if music is thought we should naturally come to understand it as we come to

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<sup>311</sup> Levinson, 2003, 2.4.

<sup>312</sup> Malcolm, Norman, *Wittgenstein: Nothing is Hidden*, 1986.

understand thought in words; not by learning how to decode or decipher it, but by learning how to respond to it appropriately and how to connect it to and ground it in our lives.

It is far complex to decide if this notion of language is totally convincing when taken alone in the case of natural language. But for the moment it is presented as an alternative for showing how a certain notion of language serves for a later reflection on music as language. Scruton's thesis of musical understanding through expression has many points in common with this other notion of language.

Through this chapter, an overview of the history of the relations between music and language and then an analytical investigation on their strict analogy, produced independent results. The first part dealt with some general ways in which music has related to language through history: music has been seen as imitating the 'procedures' of language, as attempting to 'represent' in the way language or painting did, as following the narrative structure of the linguistic discourse and, finally, reaches 'abstraction'. These are just the philosophical reasons which, on the other hand, support what a cognitive analysis is testing nowadays based on neuropsychological studies: language and music share, although not entirely, systems of the brain.<sup>313</sup>

Music appears to mimic some of the features of language and to convey some of the same emotions that vocal communication does, but in a nonreferential, and nonspecific way. It also invokes some of the same neural regions that language does, but far more than language, music taps into primitive brain structures involved with motivation, reward, and emotion [...]. Music breathes, speeds up, and slows down just as the real world does, and our cerebellum finds pleasure in adjusting itself to stay synchronized.<sup>314</sup>

From these two philosophical analyses some results can be extracted: there must be a limit in the association of a syntax and semantics in the case of music, but music can be considered to be in the same boat with language in that it supposes a meaningful act of communication: embodying, implying, and intrinsically involving thought.

Sanz González-Marrades Millet's article,<sup>315</sup> helps here to join not in terms of language conceptions in music but with aesthetic tendencies the different theories of the philosophy of language. In this way, historical currents in musical aesthetics could be

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<sup>313</sup> Levitin, Daniel J., *This is your Brain in Music: The Science of a Human Obsession*, 2006. Apart from the cognitive, Levitin develops an evolutionary perspective on music answering Stephen Pinker's argument of music as an 'evolutionary cheesecake'. Rather than a by-product of evolution, music stimulates and develops our mental capacities in its own way.

<sup>314</sup> Ibid., p. 187.

<sup>315</sup> Sanz González, Verónica, "Los problemas del significado de la música en relación con la Filosofía del Lenguaje", in Vega Rodríguez M.-Villar-Taboada C. (eds.), *Música, Lenguaje y Significado*, 2001, pp. 107–113.

seen in parallel with different theories of signification born from the study of natural language.

In very general terms, Sanz-González juxtaposes Baroque music constructed around rhetorical principles, with an *aesthetic of imitation*, in the sense of an imitation of the natural emotions; Romanticism with an *expressive aesthetics*, expression of the individual emotions of the artist; contemporary music tends to avoid the notion of music as referential, either of conventional or private emotions or of any natural scene or description, thus it is compared to a *formalist aesthetic*, the signification of music was found in the music itself, in its own ways of organising.

These theories of musical signification (imitation, expression, and formalism) were revisited by Sanz González in relation with the ‘referentialist’, ‘intentionalist’, and ‘semantist’ theories of language. A *referential* theory of language finds a basic relation between the noun and the named—an object. As it describes a relation of imitation, its counterpart in musical aesthetics would be the aesthetics of imitation. The *intentionalist* believes that language is the mere outward manifestation of the internal consciousness consequently failing to explain intersubjective knowledge. Its counterpart in musical aesthetics would be the aesthetics of expression. A *semantist*, unlike the antique referential theory, considers the minimum unity of signification is not the noun but the proposition. The proposition reflects a fact in the world; this vision implies an analytical study of the parts of the proposition. Formalism in music is associated with this vision for studying the relation of the parts of the composition. But yet for semantist philosophers, the reference outside the world of the sentences they analyse is crucial for the epistemic goal of language. A crucial difference is that for the musical formalist, the signification is however internal to the musical work.

In addition to these, the philosophy of language offers the *pragmatist* theory of language. For this last one, signification is neither associated with an external object or with facts, nor to an internal consciousness, but resides in the use of the words in different situations. For this reason, signification is dynamic and open. Pragmatism would allow, in the case of music, an explanation for how symbolic qualities of sounds function. These symbolic qualities are those that add the value of ‘joy’ or ‘sadness’ to certain sonic combinations, are shared, and are not illusory, but are also distinct from those inherent to pitch (high/low), duration (long/short), intensity (loud/soft), and timbre. They function as certain rules which are current in a community, as rules of taste and of a practice. It is a matter of use, again, that determines their significance.

From the first historical part of this chapter, it is deduced that the idea of a musical temporal logic already involves a vision of music and focuses directly on the analysis of

a very determined music. The notion of absolute music and formalism influenced the idea of viewing music as an ascetic organisation in time, whose modalities could be deciphered from formal proceedings. The basic aim is to describe general rules hidden behind the works that would give an account of a certain meditation on time in music.

Concluding, we are going to move from a general understanding of music as language to an extension of these theories to the present purpose of a philosophico-logical analysis of temporality in music. The ultimate purpose of this chapter is to decide which perspective on language serves at the time of deciding for a semiotic study of the temporal signification of music. A syntactist perspective towards musical temporality would concern the study of time exclusively within musical syntagma; semantist approaches relate music to general abstract ideas of time; a pragmatist position descends to particular temporal conceptions inside a whole period or the work of a composer. The pragmatist meaning is emphasised at the end of this thesis, considering the nuances exhibited by different musical temporal representations and the particular temporal meanings arising from different periods and geographies, nowadays studied specifically as the social psychology of time. This pragmatist position decides also in advance a special understanding of a *musical logic* as an organisation of its own type, as follows in Ch. 4, independent of the development of musical language as logic in its strict sense and on the other hand, of an application of logic just for technical purposes.

[I]n music, there is no form without logic, there is no logic without unity.<sup>316</sup>

Arnold Schönberg

One notices a double evolution in the principle of the 20<sup>th</sup> century: logic has become more mathematical, thereby losing its ancient status of philosophical discipline; the question of a musical logic has become explicit as a search for a “coherence” specific to music. This musical evolution is contemporary with the end of tonality and of thematism which were the principles that until then, ensured the coherence of musical works.<sup>317</sup>

François Nicolas

## 4. Music, Time, and Logic

This chapter presents three paths to explore the topic of music, time, and logic. It first tackles the comparison of music with formal logic (as classical logic, the logic of Antiquity), born for the sake of preserving the correction of reasoning in an eventually complex chain of arguments. Here it argues that the general associations with music are simply metaphors, on the basis that music cannot reproduce either the specificity of verbal language or, moreover, its informative goal. Secondly, a comparison is also made from the point of view of formal logic as logistic (the modern symbolic logic) but which, again, cannot be taken in any strict sense—as can be deduced from the treatment given by Frederick Taylor<sup>318</sup> and from Peter Gibbins<sup>319</sup> critique of it.

Further on, the chapter concentrates on the idea that music has its own ‘logic’. For this view, the history of the term ‘musical logic’ in the aesthetic tradition,<sup>320</sup> its connection with the history of instrumental music and its relationship with the idea of the so-called ‘absolute music’ is the most relevant. This germinal idea is amplified with other works on musical logic in musicology<sup>321</sup> and musical logic in 20<sup>th</sup> century music<sup>322</sup>.

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<sup>316</sup> Schönberg, Arnold, *Style and Idea*, 1975, p. 244.

<sup>317</sup> François, Nicolas, “Questions of Logic: Writing, Dialectics and Musical Strategies,” *Mathematics and Music*, 2002: <http://www.entretemps.asso.fr/Nicolas/english.html>. April 2009.

<sup>318</sup> Taylor, Frederick E., “Music and its Logic,” *The British Journal of Aesthetics*, 1974, pp. 214–230.

<sup>319</sup> Gibbins, Peter, “Logics as Models of Music,” *The British Journal of Aesthetics*, 1976.

<sup>320</sup> Dahlhaus, 1999.

<sup>321</sup> Seeger, 1960, pp. 224–261.

<sup>322</sup> François, Nicolas, “How to Theorize Music Today in the Light of Mathematics? A Musician’s Point of View,” *Gazette des mathématiciens*, 2009:

Finally, the chapter discusses the topic of the strict application of logic as a representational language for technical purposes connected to music. It presents the connections between computation and music in general,<sup>323</sup> but emphasising temporal logic and music computation.<sup>324</sup> However, these technical approaches relate to the goal of this inquiry on music, time and its logic, only in the sense that philosophical discussions are connected to them and could arise beyond their practical implications.

There seems to be a fourth way of connecting music and logic, in philosophico-logical studies of the sort undertaken by Kari Kurkela<sup>325</sup> and Cynthia Maria Grund<sup>326</sup>. These theses use logical means to initiate a philosophical debate outside that of time and music properly, i.e. musical performance, the first, and the theory of metaphor and counterfactuals in relation to music, the second. As they do not entail directly musical temporal logic issues, they are not going to be considered in this chapter.

Different is the case of Jos Kunst's work.<sup>327</sup> In consonance with the present study, Kunst adopts logical tools, modal logic specifically, a logic extended from the classical one, from which temporal logic originates, as a language for understanding the logical process of musical listening. Kunst's view will be discussed in section 4.3.2.1. of this chapter.

Section 4.3.2.2. will support the idea of a musical logic from a philosophico-logical perspective, using the means of temporal logic but mainly for an aesthetic reflection. At the end, this aims to enlighten ideas in section 4.2.

The difference of perspective that is involved with Susanne Langer,<sup>328</sup> Jonathan Kramer<sup>329</sup> and Alan Marsden<sup>330</sup> around the topic of music and logic should be a point of departure. There certainly are differences between (1) trying to compare *strictly* the logic of language with that of music and (2) trying to use logic as a meta-language for evaluating practical representations or even for reproducing strictly 'in-time' situations (the timing). Langer and Kramer, were thinking within the first side of the issue; meanwhile Marsden was pursuing the second. The present thesis, although it considers

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<http://www.entretemps.asso.fr/Nicolas/english.html>. April 2009.

<sup>323</sup> Kassler, Michael, "Computation and Music," *New Grove Dictionary of Music and Musicians* (paper version, updated online), 1980, pp. 603–615.

<sup>324</sup> Marsden, 2007.

<sup>325</sup> *Note and Tone*, 1986.

<sup>326</sup> *Constitutive counterfactuality: the logic of interpretation in metaphor and music*, 1997.

<sup>327</sup> Kunst, 1978.

<sup>328</sup> Langer, 1942, pp. 204–245.

<sup>329</sup> Kramer, 1988, pp. 2–3.

<sup>330</sup> Marsden, 2000, pp. 11–13.

these antecedent works as important, develops a third path with the aim of contributing to the topic from other perspective. It offers a philosophical interpretation or hermeneutics on the idea of musical logic, particularly musical temporal logic. To sum up, it can be said at this stage that logic connects metaphorically with music in the search for an answer to the question of coherence of musical universals, helps musical technologies to produce effective musical software, or, finally, it serves as a fruitful language for elaborating a philosophical and rational discussion around music, especially about music as a temporal art. This third path is the one chosen for this thesis.

#### **4.1. Music as Logic**

The idea of music as logic is metaphorical if strictly taken—as it was for music as language, when we compared music with the specificity defining verbal communication. The comparison can come from a search into classical or symbolic logic. None of them satisfy at the end in that both logics are, with different technical capacities, coming from the formalisation of schemes of verbal arguments.

Charles Seeger (1886–1979), in his pioneering article on the logic of music, delimits in what sense music is logic and in what sense it is not. What are the meeting points and what the points that indicate a specifically musical version of logic? Music-knowledge and speech-knowledge share gradual “points of identity (homology), similarity (analogy) and difference (heterology)”<sup>331</sup>

In this article, Seeger’s term ‘logic’ appears as the most appropriate for describing the inner order of music, in preference over the term ‘design’, which he rejects. In comparison, the author explains, the word ‘logic’ is functional—meanwhile ‘design’ is structural; ‘logic’ refers to temporal more than spatial aspects and it is associated with synthesis instead of analysis. ‘Logic’ would describe the process from small to large units (beginning-cursus-end); ‘design’, the reverse, from large to small ones.<sup>332</sup>

The reasons argued for the election of ‘logic’ as a methodological mean for understanding music, in preference to, for example, ‘rhetoric’ is that logic is more convincing for this study in that it provides notions of coherence, order, and transformation.

Eduardo Fernández, in his analysis of Johann Sebastian Bach’s music for lute as transcribed for guitar, interestingly chooses the term ‘rhetorics’. Curiously, he defends

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<sup>331</sup> Seeger, 1960, p. 226.

<sup>332</sup> *Ibid.*, pp. 226–228.

this election on the basis that the term reflects “what follows from what, *logically*”<sup>333</sup>. This seems contrary to rhetoric, where what follows could not be logically but *fallaciously* extracted from its premises. He focuses mainly on one aspect of rhetoric, that which is dedicated to the organisation of discourse (the *dispositio*), rather than looking in the music for a thorough association of the rest of rhetorical stages (i.e. invention, ornamentation, pronunciation and memory). Fernández remarks that the goal of rhetoric, persuasion, must be reinterpreted in music as an *acoustic persuasion*. In this sense, rhetoric seems to be closer to artistic discourse, since it does not attend so much to the *senses* in the sense of ‘signification’ but, to the ‘music’ present in language. However, Bach’s music shows more the characteristics of logical than of fanciful discourse and in great measure Fernández concedes this idea, as he explains throughout his essay the ‘coherence’ of Bach’s music.

Fallacies of the type exhibited in Plato’s *Gorgias* are not likely to be demonstrated in music since we do not have grammatical categories that leave us with clear conditions for solving the problem. However, ideals of the sort propagated in this dialogue such as those of ‘conciseness’, ‘agreement’ or ‘co-operative dialogue’, ‘precision’, and ‘order’ may be demonstrated in Bach’s music. Also the idea of ‘refutation’ can be demonstrated, i.e. of an argument which wins by proposing a more convincing idea.

This resembles Paul Grice’s<sup>334</sup> general conditions for discourse as well, namely, the Cooperative Principle (CP) that states that we have common purposes when we talk about something. It also resembles the more specific maxims inspired by the categories of quantity (‘be informative’, ‘be succinct’), quality (‘say the true’, ‘give evidence’), relation (‘be relevant’), and manner (‘be perspicuous’, ‘avoid obscurity, ambiguity’, ‘be brief, orderly’). As a consequence, it is justified to speak about ‘logic’ in music (although always analogically) instead of using ‘design’ or ‘rhetoric’.

Seeger states that there is a degree of predictability in the *logical development* of music:

The degree of uncertainty is less in a comparatively stabilised idiom, cultivated within a small, homogeneous society with few or no acculturative impacts than in rapidly changing idiom cultivated in a highly diversified society and across political boundaries [...]. But even in this latter case, the limitations are ponderable.<sup>335</sup>

This associates from the beginning the topic of logic in music with that of predictable organisation. It means that it is not very difficult to predict what will come

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<sup>333</sup> Fernández, Eduardo, *Ensayos sobre las obras para laúd de J.S. Bach*, 2003, p. 19.

<sup>334</sup> Grice, Paul, “Logic and conversation”, 1985.

<sup>335</sup> Seeger, 1960, p. 227.



from a very simple language as for example a children's song, but it is so when music acquires certain degrees of complexity and originality—still within certain restrictions. This commentary helps to moderate Scruton's position exhibited in Chapter 3 of this thesis, on music as not deserving to be called 'language' since it supposes unpredictability, a characteristic not found in discursive language, where rules must be obeyed for communication to be possible.

'Homology', 'analogy', and 'heterology' describe the ways in which the logic of music has any relation with the logic of speech. Seeger assumes at the beginning a double hazard: 'Epistemological, semantic and terminological' at a first instance. He quotes words such as 'knowledge', 'thought', 'reason', 'order', 'meaning', 'form', all having musical counterparts, being concepts that come from speech-logic. However, he stops at the problematic concepts of 'quantity', 'quality', 'truth' and 'untruth'. These terms would seem to have no counterpart in music. The second hazard is 'methodological': there is the problem of reporting one technique of communication (music) in terms of another (speech).<sup>336</sup> These two hazards can be very well translated to the present thesis.

*Homology* between music and speech is recognised since both are traditional techniques of communication, implying sound signals and messages to decode. Communication systems have an 'endosemantic function' defined by a presenting again (re-presenting) of selected functions, constructions, and relationships, which are shared by a certain community of competent users.

*Analogy* between music and speech is described by the presence of units for signalling in both activities, either 'morphemes' or 'musemes'. But speech also has an 'ectosemantic function' foreign to music.

Speech-logic lies entirely in the message complex, not at all in its signal. Although it can be communicated only by the signals of a language, the speech-logic communicated by the speech-message is not dependent upon the signals of any particular language. A speech-logical cursus can be translated into another language using entirely different sound-signals without the least distortion. A music-logic, on the other hand, certainly lies in the signal of a signal-message complex; in the message, to whatever extent this can be distinguished from the signal. A music-logical cursus cannot be "translated" into another music employing different sounds in the signal without distortion.<sup>337</sup>

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<sup>336</sup> Ibid., p. 228.

<sup>337</sup> Ibid., pp. 229–230.

*Heterology* lies in the fact that sound signals play no logical role in the (common, informative) speech, meanwhile in music, units of musical-logical form are found in pitch, loudness, timbre of tone, tempo, proportion, and accent of rhythm. Polyphony (“successive combinations of simultaneous combinations of melodies”), or its multilinear order, is also unique to music. Speech, however, is characterised by monophony, unilinearity in its cursus, generally pursuing correspondence between what is said and what exists in reality.<sup>338</sup>

#### **4.1.1. From the Classical Logic Perspective**

A fresh view of speech-logic allows Seeger to consider the three main principles of the classic Aristotelian logic in music. ‘Identity’ (‘what it is, is’), ‘contradiction’ (‘nothing can both be and not be’) and ‘excluded middle’ (‘everything must either be or not be’) have their musical counterparts:<sup>339</sup>

- *Identity*: modified as ‘Whatever seems, is’; is explained by the existence of traditions for music communication and consensus on skill and taste. This kind of identity is interpreted as social identity.
- *Contradiction*: modified as the ‘Law of seriation’. Although no musical production can be said to ‘contradict’ itself, other music, or anything at all, there are ‘unbroken series’, which speaks about the coherence of certain portions of music. Any unit of music-logical form can be transformed into any other by traditional forms of procedures. Poor or amateurish music skips this principle of seriation.<sup>340</sup>
- *Excluded middle*: as ‘Law of compensation’. The simple functions of pitch, proportion, tempo, and loudness show different degrees of variance. Variance of one kind is compensated by an opposite variance, e.g. a raising of pitch compensated by a falling of pitch. This tends to establish an axis from which the two kinds of variance are organised (according to this principle, movements are ‘centric’ or ‘decentric’).

Seeger’s study introduces the reader to the main concepts of classical logic. It tackles the notion of ‘syllogism’, speech-logical device consisting in the form  $a=b$ ,  $b=c$   $\supset$   $a=c$ . The syllogism has three propositions in total considering the two premises with the conclusion or inference. Propositions are divided according to their quantity

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<sup>338</sup> Ibid., pp. 230–232.

<sup>339</sup> Ibid., pp. 232–233.

<sup>340</sup> This relates to Taylor’s rules of inference by similarity and expectation mentioned below.

(Universal and Particular) and quality (Affirmative and Negative), combinations that give the four main propositions: A (universal affirmative), E (universal negative), I (particular affirmative), O (particular negative).

There are 256 possible modes of syllogism. The number is the result of calculating  $4^4$  (64 moods, extracted from 4 propositions A, E, I, O and 3 premises:  $4^3$ , altogether again by the 4 figures). The figures are the different arrangements in which the Subject, Medium and Predicate terms can be ordered in the syllogism. From these 256 combinations not all respect the rules for creating valid forms of arguments, for different reasons, resulting in 19 valid modes.

It is important to add to Seeger's brief revision of syllogism, that the conclusions resulting from the syllogism can be true or false. This means that the syllogism *preserves* the truth but does not create truth. Thus, having true premises, the true conclusion is *guaranteed* by the scheme of thought.

To conclude, Seeger describes the logical modes of possible organisation of the musical parameters, without attributing to them any truth-value. Seeger says identities (homology) between music-logic and speech-logic proved to be of a very general character; while analogies less so. Finally, differences are clearly distinguished and necessarily inferred. Affirmation, truth, and concordance are attributed to music in a poetic and mystical way rather than in a scientific and logical one. At some stage he recognised that the idea of truth as coherence (rather than correspondence) is anyway much more convenient. For the moment, the result is that logics of speech and music have to be dealt with separately.

Seeger's work presents the system of the 'moods of a music-logic'. The compositional functions of pitch, loudness or dynamics, tempo, and proportion are described in terms of 'direction' and 'extent' of variance and their development in the musical cursus will resemble the consistency of the premises of the logic of discourse. "A music-logic would thus appear to be a pure logic. And it seems an unnecessary complication of our vocabulary to designate any factor in such a logic as truth or untruth".<sup>341</sup> The order the author follows to arrive at the moods of musical logic is summarized in the form of steps. But this topic belongs already to section 4.2. on the idea of a 'musical logic'.

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<sup>341</sup> Seeger, 1960, p. 236.

#### **4.1.2. From the Symbolic Logic Perspective**

A second author dealing with music and formal logic, but generating his arguments from symbolic instead of traditional or classical logic (as Seeger mainly did), is Frederick Taylor. Taylor addresses in “Music and its Logic”<sup>342</sup> certain notions displayed by music such as ‘axiom’, ‘implication’ or ‘rules of inference’, and ‘consistency’. By musical axiom, he understands those certain selected sounds from which all the work derives; either of the type working in whole styles (general axioms) or in particular works (particular axioms). Implication and rules of inference are found in the relation of expectation and similarity between sounds. According to him, a musical segment is consistent when it keeps the above-mentioned relations of expectation and similarity in relation with other neighboring segments.

Taylor’s ultimate goal is different from Seeger’s, who seeks for the *moods* of a music-logic. It resides in the comparison of music and logic as means of defending *universals* in music, which in the end are just partially defended.

The idea of a literal meaning of a musical logic supposes much more than a stimulus-response behavior in some sort of ‘familiar resemblance’ between a music and its listener, idea that Leonard B. Meyer (1918–2007) defended in his *Emotion and Meaning in Music* from 1956. Taylor, on the contrary, has in mind the defence of some principles behind the music, which make it understandable:

It is my contention to the contrary that meaning and value in music are greatly determined by certain universal and necessary properties and that while we must agree that a familiarity with the music of an individual culture, period or composer plays its part in musical understanding, this role is neither a sufficient nor a necessary prerequisite for one’s comprehension of a great portion of the meaning of any work.<sup>343</sup>

According to Meyer, “the particular organisation of sounds in any work is not due to any universal or natural property of music but is culturally determined”.<sup>344</sup> Taylor then searches for a musical logic by indicating two rules of inference. The first obeys to expectation. Here he presents some comparison with the logical deduction, from which he explains the wrongness of that usual equation of musical logic associated with determinism in creation:

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<sup>342</sup> Taylor, 1974.

<sup>343</sup> Ibid., p. 214.

<sup>344</sup> Meyer, 1956, p. 152.

We must not think that because a composer has chosen a set of axioms and rules of inference the direction his music will take is therefore determined any more than we believe that a logician presented with a set of formal axioms and rules of inference is thereby regulated to deduce a prescribed order of theorems. As in formal logic, the necessity involved is not a forward direction but a backward one by which any derivation (theorem) can, by using various rules of inference, be traced back logically to the axioms. What is musically logical is what makes sense, what proceeds expectedly and without surprise; what is illogical and underivable is what is unexpected and unfamiliar.<sup>345</sup>

The second rule of inference in music considers similarity of sound. “[S]imilarity occurs as a result of at least one aspect (melody, harmony, rhythm) of the former sound segment being retained or repeated in the latter.”<sup>346</sup>

Once Taylor defines the sense of derivation by finding in musical expectation and similarity of sounds the ideas of musical implication and inference, he goes ahead by defining a musical axiom, i.e. by principle, something that is not derived.

There are two types of axioms. The first, general or external axioms, are abstract relations of sounds found in many works of a particular style or period which when coupled with a musical rule of inference imply a proceeding set of sounds.

[...]

The second class of axioms, particular or internal axioms, [...] comprise the subject matter of themes, motifs, tone rows and rhythms as well as, though rare, particular vertical relations. [...] Unlike general axioms they are seldom used in more than one work.<sup>347</sup>

Taylor’s vision on the logic of music supposes levels of derivation and degrees of derivation. This means, different parameters developing different degrees of expectation and similarity. There are stronger and weaker degrees of derivation. Melodic and harmonic parameters imply a greater degree of expectation, for example, than form or instrumentation. This leads to consider a subtle linear continuum going from what is not music to what is music. If sounds are increasingly connected by expectation and similarity then one is in the presence of music.

The final goal of such a study seems to be that “[t]he understanding and aesthetic appreciation of a work is far from a relative thing.”<sup>348</sup> However, Taylor does not defend his position straightforwardly when he assumes “that increasing familiarity with new

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<sup>345</sup> Ibid., p. 216. He points out here as a quotation 6, p. 229, the example of the rules of substitution in logic: the logician derives *freely* new formulas from old, depending on what he chooses to substitute. This means, different theorems (subsidiary truths) can be extracted from the same axiom (underivable truth), showing that although expected, some sort of creativity belongs in logic as well.

<sup>346</sup> Id.

<sup>347</sup> Ibid., pp. 217–218.

<sup>348</sup> Ibid., p. 229.

styles in art modifies previously held expectations or gives rise to new sets of expectations which are relevant to a new kind of art in question.<sup>349</sup> This is a balanced view, permeable to a combined vision that universals exist but manifest in particular ways in music. As a consequence, “[w]hat is culturally determined and learned is not the logic of music *but only its axioms*.”<sup>350</sup>

The author connects appreciation with cognitive aspects. Aesthetic judgements are not exclusively judgements of taste (something relative and impossible to be defined). On the contrary, aesthetic judgements depend in great part on the comprehension of empirical facts. “[T]he appreciation of any musical work presupposes an ‘acceptance’ of its axioms and an understanding of its logic.”<sup>351</sup>

One important objection to Meyer’s view in Taylor’s perspective is that one cannot understand or appreciate music that does not belong to the person’s habits of listening:

Certainly without the knowledge of general axioms derivations from expectations could immediately not be formed; and there would probably be some derivations (e.g. formal ones) never made. However, derivations by similarity would surely be made and with a limit on the number of axioms the work would be organised and gain meaning. Derivations in rhythm, harmony, melody and instrumentation could all be formed, establishing the significance of particular axioms.<sup>352</sup>

This is concerning axioms and rules of inference. The third important notion Taylor develops is that of consistency. This property is kept in musical works when they respect relations of expectation and similarity. On the contrary, inconsistency comes from the lack of certain degree of expectation and similarity.

Taylor discusses finally about ambiguity. Ambiguity in music can arise from two situations: a weakening in the whole work’s logic (when derivation rules do not function) or by intricacy and complication that obscures the clear logic of the work. Contrastingly, Meyer thought that ambiguity is produced “because the listener is unable to envisage with any reliable or decisive degree of probability what the future terms will be.”<sup>353</sup> Taylor replies to this former notion:

Ambiguity is not simply a doubt as to the direction a passage is taking, nor is it a simple delay in resolution (in which case tension and suspense may result). Ambiguity in its true meaning is the understanding of a single passage or sound segment in two or more diverse ways as, for example, in the case where the logic of two or more vertically related axioms or derivations is not

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<sup>349</sup> Ibid., quotation 10, p. 219.

<sup>350</sup> Taylor, 1974, p. 227.

<sup>351</sup> Id.

<sup>352</sup> Ibid., pp. 226–227.

<sup>353</sup> Meyer, 1956, p. 51.

understood or, as in the case of deviations, when a passage seemingly does and does not have meaning.<sup>354</sup>

Concluding, the less convincing part from Taylor's contribution would reside in the interpretation of its logical terms in a strict sense. Although it is dubious that Taylor himself had this in mind, from the chosen title 'music-and-*its*-logic', which already deviates from the straight question of how music can be comparable to logic, there already is a point on discussing whether a parallel would be fruitful, in that it is more confusing than clarifying.

Peter Gibbins wrote in "Logics as Models for Music"<sup>355</sup> that if the logic model is appropriate to music, music must show similar operations indicated for formal language—connectives, similar implication to the conditional, and analogue notion of negation—for a definition of consistency in the usual way.

Gibbins reasons are of the following sort. Musical sound-segments if corresponding to logical well-formed formulae (wffs) have only one operation, that of concatenation. In logic there are several: conjunction, disjunction, implication, negation, etc. 'X implies y' is a proposition but not a sound-segment. "The only operation on (say) a pair of sound segments which results in a new sound-segment seems to be 'horizontal' or 'vertical' concatenation."<sup>356</sup>

Then, regarding musical implication, Gibbins argues that it works not as a connective in a language in which sound-segments behave like wffs. "Musical implication as well as being unlike the conditional in logic is unlike both entailment and the conditional in failing to be transitive in 'non-counterfactual' cases."<sup>357</sup> That is, if y is expected after x, and z after y, z is not necessarily expected after x. Similarly, if x is similar to y and y is similar to z, x is not necessarily similar to z. Implication associated with expectation or similarity does not equal to logical conditional. Finally, musical similarity would be associated with logical equivalence (given the symmetry between its segments) if it was associated with the conditional, which was already refuted.

The third weak correspondence between music and formal logic is consistency. As consistency is defined in terms of negation, a system is consistent whenever it has a theorem and excludes its negation as part of it. The negation of a musical passage can be any passage, the result being: "[Y] may be a negation of x while x may not be a

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<sup>354</sup> Ibid., p. 224.

<sup>355</sup> Gibbins, 1976.

<sup>356</sup> Ibid., p. 159.

<sup>357</sup> Id.

negation of y. A negation with this property is at best a peculiar sort of negation. For a sound-segment may have two ‘negations’ which are also ‘negations’ of one another.”<sup>358</sup>

As conclusion for this whole first point of the chapter, logic, in its classical or symbolic versions and adopting a realist position, will never be predicated from music, whose elements are not words and cannot have a reference in reality. Music is logic only in a metaphorical sense. The concept of metaphor—a figure of speech in which an expression is used to refer to something that it does not literally denote in order to suggest a similarity—fits this case, where music can be said to be logic by analogy but with constraints.

## 4. 2. Musical Logic

### 4.2.1. Musical Logic in the History of Musical Aesthetics

According to Taylor, the idea of logic in aesthetics in general,<sup>359</sup> has its origins in Edmund Burke’s (1729–1797) treatise *A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful* (1757). Specifically, the idea of a musical logic in musical aesthetics originates at the end of the 18<sup>th</sup> century, when a transformation inside instrumental music from an aesthetic of action, involved in moral affection, to an autonomous aesthetic took place. The term ‘musical logic’ provides the right ‘umbrella’ behind which all defenders of autonomy in music could shelter.

Dahlhaus<sup>360</sup> wrote that it was Johann Nikolaus Forkel (1749–1818) who first spoke positively about a musical logic in a harmonic sense. In the same manner that logic regulated and determined linguistic expression, *harmony* regulated and determined melodic expressions. However, this particular sense of musical logic continued attached to an idea of music as a language of affections.

According to Dahlhaus, it was Karl Wilhelm Friedrich Schlegel (1772–1829) who in turn noticed that, for the logic of music to deserve the pure character proper of the aesthetics of autonomy, this autonomy should be found in the *thematic* process. The idea of a thematic logic implied a “certain tendency to philosophy in the pure instrumental music.”<sup>361</sup> Music in this way creates a text, develops, confirms, varies, and originates contrasts, in the same manner as a sequence of philosophical ideas.

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<sup>358</sup> Id.

<sup>359</sup> Taylor, 1974, p. 214.

<sup>360</sup> Dahlhaus, 1999.

<sup>361</sup> Ibid, pp. 106–107.



According to Dahlhaus, Schlegel inspired the later, foundational treatise by Hanslick on absolute music. In addition, Schlegel's vision inspired later formalist approaches to music as it was held by Wittgenstein.<sup>362</sup>

#### **4.2.2. Musical Logic as a Search in Contemporary Music**

There is a second stage in the discussion about musical logic within musicology. François Nicolas' writing "Questions of Logic: Writing, Dialectics and Musical Strategies"<sup>363</sup> explores the topic from a mathematical symbolic logic. It provides musical examples beyond the musical logic traditionally conceived in tonality (either harmonic or thematic) mainly related to the repertory proper of European Classicism and Romanticism, as it was mentioned by Dahlhaus. François' article changes the focus and enters into European Contemporary music repertory, discussing its exchanges with contemporary logic.<sup>364</sup>

Today we are witnessing a proliferation of the power of calculation applied to music, witness Ircam. What might be called *musical reasoning* risks of lose some of its rights: the right to direct and to canalise this surplus power in calculation that is extraneous to music and invading the terrain of well-established operations, traditionally conducted with pen and paper. The increased capacity of calculation can no longer be ignored by composers. Their task is to identify the lines of force capable of aliment their own thought.<sup>365</sup>

François' speaks about a musical logic properly, putting restrictions to the mathematical, acoustical, and psycho-physiological tutelages.

I will defend a quite different thesis: that music as thought is capable of self-normalisation (which by no means signifies self-entrenchment or self-definition, and even less self-demonstration of its own coherence: musical autonomy is neither autarky nor, strictly speaking, a nomology). What is claimed is that the logic of music is a musical logic. It is not a mathematical-arithmetical, physical-acoustical or psycho-physiological logic.<sup>366</sup>

Although he is against any definition of music and in the end, of musical logic, he searches for the interaction between new music and logic.

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<sup>362</sup> Ahonen, Hanne, "Wittgenstein and the Conditions of Musical Communication," *Philosophy* 80, 2005, pp. 513–529.

<sup>363</sup> François, 2002.

<sup>364</sup> For an introduction to non-standard logics see Haack S., *Philosophy of Logics* (Cambridge University Press, 1978), on *deviant*, *quasi-deviant* and *extended* logics from classical logic (for example, the case of temporal logic as extension logic, supplementing classical logic).

<sup>365</sup> François, 2002.

<sup>366</sup> Id.

If *music* cannot be defined, could *musical logic* be? Surely not, again, because of the too strong proximity between the *names*.

Just a very simple demonstration scheme *ad absurdum*: if one could define *musically* what musical logic is, one would be so able to define *musically* what music is. From the impossibility to do this (see the previous axiom, or *axiom of proper name*) follows directly the impossibility to define a musical logic.<sup>367</sup>

What is interesting about François' article as well is his position regarding calculation and music. The reason why his work could not be put in the following section titled Logic Applied to Music is that he does not pursue a straightforward application of mathematical logic to music, but just a theoretical comparison. This topic, the double path going from mathematics to musicology and from musicology to mathematics, was explored recently by François.<sup>368</sup>

On the contrary, the most dominant approach for François is that of reducing mathematics to a collection of formulas that can be applied to, or transposed as, music. Iannis Xenakis as composer has built his reputation on operations of this kind.

My thesis is that any assumption of a relation between music and mathematics must proceed by way of philosophy, not through a compendium of calculations. If there is a question of contemporaneous thought between mathematics and music, not of vassalage or of application, then it is philosophy to which we must delegate the setting up of a conceptual space capable of containing it. This is so because musical thought is not scientific but artistic, so that direct links between, for example, mathematics and physics, have no counterpart in the case of mathematics and music: in the former case, such relations are rendered valid if one assumes the ontological character of mathematics [...]. But, more precisely, music is not a science, and musical logic is not an acoustical logic.<sup>369</sup>

## **4. 3. Logic Applied to Music**

### **4.3.1. Music, Logic and Computing**

Logic as a formal tool for managing musical data in order to accomplish practical goals, such as software designs for composition or programmes for automatic musical analysis, has been fruitfully applied.

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<sup>367</sup> Id.

<sup>368</sup> François, 2009.

<sup>369</sup> François, 2002.

The present section will not so much be concerned with the ideas of music-as-logic or ‘musical logic’ in the musicological tradition, but rather with music as processed by logical means. This situation departs from a general towards a restricted perspective: from computers processing musical data in general, where logic serves as intermediate language for the design of automata, to particularly the evaluation of the efficiency of representations of musical time, via the tool of temporal logic. The section will concentrate on developing this last concrete issue, since it is directly related to our proposal.

Briefly, and concerning the first general aspect above mentioned, on the necessity of logic for musical data computation, Michael Kassler<sup>370</sup> explains:

Whereas musical processes manipulate music only, musicological processes manipulate music together with statements about music, e.g. to verify the statements or to falsify them, or to test two for compatibility with respect to particular musical compositions. Such statements are traditionally written in one or another natural language, such as English. It is far beyond the current state of knowledge to have a machine analyse natural language well enough to extract its meaning—otherwise machine translation would be feasible now. Consequently, before a computer can handle such statements properly, one must reconstruct them in some specially designed code whose form and interpretation are sufficiently constrained to eliminate any uncertainty or ambiguity of meaning.<sup>371</sup>

When Alan Marsden, reflects on logic as a language for computing, he refers to the same issue expressed by Kassler: the simplicity of logic for collaborating in the design of a language easily implemented by automata. However this has its costs:

While a logical statement might avoid misunderstanding arising from misinterpretation of its component terms, because the logical significance is precise, absolute and well defined, it does not necessarily facilitate understanding nor avoid misunderstanding arising from simple mistakes. Logical statements can become extremely lengthy and complex, even when the idea to be represented can be expressed rather simply in natural language. [...].

Computers, on the other hand, are well capable of coping with complex expressions constructed from many layers of simple components.<sup>372</sup>

The use of computation in musicological research is specially underlined by Kassler. His formalisation of a particular music, such as Schoenberg’s twelve-tone music, is proposed to provide an algorithmic determination by which any given musical composition belongs to this class of music and, if so, to provide an automatic analysis of the composition’s structure.

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<sup>370</sup> Kassler, 1980, pp. 603–615.

<sup>371</sup> *Ibid.*, p. 604.

<sup>372</sup> Marsden, 2000, p. 11.

Kassler refers to Schenkerian analysis of tonal music in particular as an informal theory still, in comparison to his own study of atonal music. The question whether it could be possible to obtain a formalisation of tonality (as for atonal music) and provide ‘automatic’ analyses remain.<sup>373</sup> From the point of view of musical analysis, the task implies creative work, so, many alternative analytical insights, all equally possible, can be provided for the same piece.

Kassler dares to predict:

Since the theorist could ask the computer to generate (for his evaluation) new music to satisfy a proposed theoretical formulation, the man-machine environment here outlined could blur the present distinctions between composers, theorists and performers.<sup>374</sup>

A reflection on this should take into account however that the theorist is always working on ready-made music, i.e. existent, ready-made rules. So, first instances of new music would be always dependent on human creativity.

#### **4.3.1.1. The Use of Temporal Logic in Evaluating Musical Time Representations**

In principle Marsden’s approach reflects an atemporalist view of time. His use of temporal logic and especially his use of one very sort, *chronological logic*<sup>375</sup> that works with the so-called definite statements (or ‘genuine dates’) such as ‘In 2001 there was a revolution’ and whose truth-value is fixed, inscribe him in this tendency. Atemporalists tend to interpret time as an ‘out’ thing. This, in comparison with other approaches in temporal logic (namely *tense logic*); tense logic defends the temporal condition of our assertions of the type ‘Tomorrow there will be a revolution’, in that the truth-value depends on the point in time from which the assertion is done. These assertions are made instead from ‘inside’ time.<sup>376</sup>

Temporal logic formalises, then, basically two modes of expression present in Indo-European languages: grammatical tense and chronological statements. There is also the possibility of formalising temporal adverbs and prepositions expressing temporal information (‘tomorrow’, ‘yesterday’, ‘next’, ‘then’, ‘since’, ‘until’).<sup>377</sup> Marsden applies

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<sup>373</sup> A recent topic developed by Marsden, 2010, in “Schenkerian Analysis by Computer: A Proof of Concept”, *Journal of New Music Research*:

<http://www.lancs.ac.uk/staff/marsdena/publications/ProofOfConcept.pdf>

<sup>374</sup> Kassler, 1980, p. 613.

<sup>375</sup> Rescher N. and Urquhart A., 1971, pp. 27–30.

<sup>376</sup> Notice that different from Langer’s temporalist view, logicians believe that time passing can be approached theoretically.

<sup>377</sup> Gardies, 1979, pp. 82–105.

two of the above mentioned temporal logic frameworks: the chronological one and the temporal logic working with the operators Since and Until. (Grammatical tense logic will be explored with Kunst's work and it is the approach introduced in our thesis in Chapter 5).

In general, temporal logic adds to classical logic means of generating sentences and inferences involving time and for making inferences on the basis of the time at which statements are made. As was mentioned, temporal logic is divided into tense and chronological logic. The first works with 'indefinite statements' of the sort 'Tomorrow there will be a revolution'. For Fp, 'Something happens in the future', is in the present uncertain, but can be true or false when the moment is reached. The second type of temporal logic works with 'definite statements' of the sort 'In December 2001 there was a revolution'. These different views are very well introduced in the work of Rescher-Urquhart as two basic perspectives. Characteristic of the first type of propositions is its change in truth-value with time; of the second, that are invariant with respect to time, they are always true or always false.

The two long traditions of temporal logic were born from the 'atemporalist' and the 'temporalist' views, as metaphysical perspectives on time. Marsden chooses in this first occasion the version of temporal logic that most serves to his purpose, that is, the atemporalist one.

The present study is concerned with representations which are 'out-of-time', and logics of the first two kinds described above are appropriate (This means that, in the terms of Rescher & Urquhart, the present study is not concerned with temporal logic, but with chronological logic (1971, p. 30).) Indexical and modal logics, on the other hand, would be appropriate for 'in-time' representations intended to describe the behavior of dynamic systems.<sup>378</sup>

According to Alan Marsden's book, the decision for a certain approach should define whether the analysis of temporality is going to be displayed for describing 'in' process time (while listening) or 'out' of process time (once the process has ended, when one has the spatial organisation of it).

Logic is for Marsden "a means for describing representations",<sup>379</sup> that is, a language that permits the comparison of existing systems and demonstrates its expressive capacities for later processing. What is important to be mentioned for the present proposal however is that, for the temporal information to be explicitly expressed, questions of 'substance' and 'structure' of the time of music have to be clearly settled. This more or less equals to what is called here the 'nature' and 'structure' of musical

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<sup>378</sup> Marsden, 2000, p. 17.

<sup>379</sup> Ibid., p. 13.

time. Substance will deal with the kind of things time consists of (points, intervals, periods, moments, or events) and structure comprehends the shape of time (linear, circular, or branching). Furthermore, 'extension' will consider whether time is finite, infinite or unbounded and 'texture', whether it is discrete, dense, or continuous.

To evaluate existing representations of musical time, then, it is necessary for Marsden to enter into a study of the ontology of musical time, since it brings the principles which are underlying these representations. Marsden introduces the key developments around shape, extension, texture, and substance found in temporal logic literature. Once all this material is presented, he advances choosing what the best ontologies for certain technical purposes are, in that some schemes appear more useful than others.

Concerning the question of the shape of musical time, it is the precedence relation (before–after) which is at the basis of any definition of time. The changes operated on this relationship, will bring the different ontologies. *Linearity* is the simplest shape time can have and its properties are defined as 'transitive', 'asymmetric', 'irreflexive', and 'connected'. It constitutes the most common shape in representations of musical time.<sup>380</sup>

However, there are cases where musical situations deal with things recurring continually. It is *circularity*, where axioms of 'symmetry' and 'reflexivity' are valid, annulling the sense of the before–after relation. Nevertheless, the precedence relation not applying here, it is possible to give a certain notion of direction to the circle. Two options for expressing this are: the 'immediate precedence' (relations in circular time defined by non-transitivity, applied to discrete texture) and 'betweenness' (a ternary relation, applied to non-discrete texture). Musical examples used by Marsden include instructions of the type '*dal segno senza fine*' ('from the sign without end'), repeated chord sequences of jazz pieces, African drumming, and repetitive minimalist music.

Strictly, circular music is impossible. This would mean music with no distinguishable beginning or end and placed right 'now'. While a kind of 'lead-in' could be appreciated in music such as it happens in the minimalist case, in logical terms circularity supposes no heterogeneity of times.

In musical terms, we can distinguish two kinds of 'circular' pieces: those which consist of a repeated segment which has a distinct starting point; and those which are more homogeneous and consist of continual repetition without any distinct point to mark the beginning and end of the repeated segment [...].

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<sup>380</sup> The explanation of logical properties in Chapter 5.

The rarity of homogeneously circular music suggests that it is not easily achieved. Sequences have to be composed in such a way as to ensure that no point stands out as a candidate to be perceived as the ending/starting point.<sup>381</sup>

As strictly circular music, Marsden mentions some kind of *ostinato* figures and rounds. Continuing, an interesting conclusion he presents here from the point of view of this study, associating this circular structure with certain cultural images of eternity and persistence. In this opportunity, he divides between examples that just ‘suggest’ rather than ‘manifest’ the circular model.

Even though circularity is generally not used as a device for representing music to be processed (instead, circular time is treated as a kind of linear time in which events recur in a continuous manner), it seems to be adaptable however in some situations. Marsden mentions the study of Seifert *et al.* (1995) where the author uses a circular representation with a starting point devised for African drumming patterns.<sup>382</sup> However, in perceptual experiments, these patterns appear to have no clear starting point, consisting in a truly circular model.

A way of representing imperfectly circular music—a mix of linear and circular time—is to use a helix-like figure:

In a representation of a piece of music which consists of continual repetitions of a sequence, each turn of the helix would correspond to one cycle of the sequence. After one cycle the music has, in one sense, returned to where it started from, and indeed in the representation it would have returned to the same point in the circular dimension. However, in another sense the music has advanced, and so it would have moved on to a different point along the linear dimension of the representation.<sup>383</sup>

This model appears appropriate for minimalist music, which returns to the same time that changes gradually.

Note also how the representation gives a neat account of how, if we listen for the progression of the piece, our sense of ‘now’ is no longer a short fragment of time but is drawn out to something longer, encompassing the whole of a single cycle of representation.<sup>384</sup>

Marsden also takes questions of perception into account. He deals with the thresholds of our perceptual structure and concludes:

Half a second (500 milliseconds) is also mentioned as the shortest time period subject to conscious control, whether in perception or action. Events perceived or performed at a faster rate are

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<sup>381</sup> Marsden, 2000, pp. 26 and 27.

<sup>382</sup> *Ibid.*, p. 27.

<sup>383</sup> *Id.*

<sup>384</sup> *Ibid.*, p. 28.

automatic and the ability to process them at this speed is either innate or acquired. [...] This plethora of data suggests that it would be advisable for anyone designing a particular application to examine closely the perceptual limits involved in the perceptual and behavioral processes modelled in that application.<sup>385</sup>

This must be compared with Rowell's claim about the weakness of Kramer's study on issues of perception.<sup>386</sup> Marsden is not dealing here, however, with perceptual issues concerning the different modes of time but with perceptual issues that must be taken into account in the design of a computational product.

A third important shape remains. In *branching* time the connectedness property—given two events one must occur before the other—, which is essential for linear time, does not apply. The consequence is the possibility for two events to happen at the same time, generating parallel branches. This structure can be conceived as something fanning out from the past, another from the future, both sharing a single onset and outcome or its opposite, displaying open branches to the left (past) and to the right (future).

Marsden applies the branching model to cases of indeterminacy, rather common musical situations in which we are obliged to interpret the same passage in different manners. Indeterminacy examples are seen in the case of simultaneous grace notes or parallel parts with synchronisation not specified, categorised as “alternative sequences involving different temporal relations of the same events”. A second group of indeterminate musical situations is that presented in *ossia* sections, where alternative passages can be practised, i.e. “alternative sequences which involve different events”. He mentions here an example from Beethoven's String Quartet in Bb major, op. 130, where the composer writes two endings for the same piece.<sup>387</sup>

The branching model is interpreted in this thesis to approach very determined ways of structuring music. A first case is that of branching to the right, to the future. It is most common in indeterminate situations (in the domain of action but also in science fiction) and examples in music are found in mobile forms.

The second is that of branching to the left. It is less frequent, but cases can be found, for example, in certain deteriorated states of our memory, among other situations.<sup>388</sup> In music, this system could be found only in the case of actual branching time, while in the potential sense of the branching there is no chance that the past has ramifications.

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<sup>385</sup> Ibid., pp. 52–53.

<sup>386</sup> Rowell, 1990, p. 353.

<sup>387</sup> Marsden, 2000, p. 28.

<sup>388</sup> Roetti, Jorge A., “Algunos temas de lógica temporal,” 1984, pp. 70–71.



The third situation of the branching allows a single beginning and a single outcome; Lutoslawski's *String Quartet*, with its passages of unison interpreted in a multitemporal performance, could be represented through this model.<sup>389</sup>

The fourth possibility represents branches fanning out to the past and to the future. Musical cases of actual parallel branching time could be seen through this type (examples of this last case will be mentioned immediately below). In Figure 1, system CR ('Cochiarella's Tense Logic system') shows this model. As a consequence, in music, all systems could conceptually apply.<sup>390</sup>

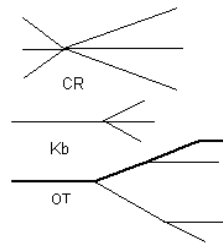


Figure 1

The last case presented as fourth possibility is considered to be the most typical of branching in this inquiry and it is considered to first have appeared in Borges' famous story *The Garden of Forking Paths*,<sup>391</sup> then in contemporary physics, the theory of many worlds presented by Hugh Everett (1930–1982) in 1957, and finally recreated by Rescher in temporal logic studies<sup>392</sup>. Marsden omits all this information, mentioning only a later story, John Fowles' *The French Lieutenant's Woman*.<sup>393</sup>

According to Marsden's proposal, it is easier at a first glance to interpret his above-mentioned cases as branching time instead of linear with disjunction, for conjunctions among the branches in branching time are easy to process by computers. However, linearity with disjunction representations uses fewer logical constants. So, in this sense it is hard to decide here on the basis of simplicity for one or the other representation.<sup>394</sup>

More important is to consider that, according to Marsden, branching representations are not 'real'. "The performer chooses which version of an *ossia* section to perform, and

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<sup>389</sup> Kramer, differently, interprets this work as Moment time.

<sup>390</sup> Extended version in Calleja M., "The Borgesian Recreation of the Theory of Possible Worlds and its Simile in Music," 2005.

Kb system shown in the graphic is just left as showing an 'imperfect' antecesor of OT.

<sup>391</sup> *Ficciones*, Buenos Aires, Emecé, 1941.

<sup>392</sup> *The Primacy of Practice*, Ch. V, pp. 88–106.

<sup>393</sup> London, Cape, 1969, quotation in Marsden, 2000, p. 28. See also Kramer, 1988, p. 13.

<sup>394</sup> Marsden, 2000, pp. 29–30.

the notes of the other version simply do not exist in the performance.”<sup>395</sup> Thus, linearity plus disjunction would be a more sensitive model for expressing these cases. However, things are more complicated from the point of view of computer processing:

[...R]epresentation in this manner [linear with disjunction] does not rule out the possibility of a performer playing both versions of an *ossia* at once. To do so would require adding more clauses to the representation explicitly preventing this, and so considerably complicate the representation. It is therefore in situations where this must be prevented or where one wishes to reason about the events in alternative sequences together that a representation in branching time has a clear advantage.<sup>396</sup>

These two cases of musical branching time mentioned by Marsden do not contemplate the sense of the branching as conceived in this thesis, which is not only *potential* but also *actual* branching, uncovered from the whole organisation of the piece of music, whose form is conceived from parallel lines of opposite material. Two examples are Alois Zimmermann’s *Requiem* (a multi-textual work) and Elliot Carter’s String Quartet No. 3 (as it presents temporal modulation along superposed, highly contrasting levels).

These are some conclusions about Marsden’s evaluation of musical time representations from temporal logic tools; to have a global perspective of his view:

Schemes which treat time as linear are generally more useful, since the advantages of circular time are very particular, and the disadvantages—principally a complication of reasoning about temporal relations because the simple relation of precedence no longer holds away—are quite severe [...] Similarly, for most purposes it is generally useful to treat time as of unbounded extent and of unboundedly dense texture. A truly infinite extent and infinitely dense texture is impossible if a representation is to be actually implemented. While a finite extent and discrete texture do give theoretical advantages in processing, these become very small if the number of discrete elements encompassed is large. On the other hand, a discrete texture is essential for applications which deal with minimal temporal quanta, such as digital audio. The area of greatest variation in representation schemes is whether they treat time points, time periods or events as the fundamental units.<sup>397</sup>

In general, there are four important points Marsden is searching for at the time of choosing for one or another ontology:

1. Expressiveness: that the ontology reflects with most fidelity the substance, structure, extension, and texture of the music to be represented.
2. Conciseness: some ontologies adjust more simply to the music.

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<sup>395</sup> Ibid., p. 30.

<sup>396</sup> Ibid., p. 31.

<sup>397</sup> Ibid., p. 165.

3. Extensibility: some ontologies facilitate representations of open music that require always further extensions; some others have the characteristic of exhausting their extension in countable steps.
4. Processing: representations must allow either finite or infinite individuals but have to be ‘countable’. “For a set to be countable there must exist a mechanism to step from one element to a ‘next’ which is guaranteed to reach every element eventually”.<sup>398</sup>

To sum up:

The most expressive representations would be based on branching time of infinite extent with periods as individuals and a dense and continuous texture. The most concise and most easily processed would be based on linear time of finite extent with points as individuals and a discrete texture. Most representations of music, if not based on events and event relations, are actually based on linear time of unbounded extent with periods expressed by start and end points, and a dense texture.<sup>399</sup>

Marsden says that the concepts of circular or branching time are useful as exceptions to be applied for cases in which other more standard, i.e. linear options are less adaptable. This would reflect that his vision is ontological according to the definition in Ch. 1, since irrespective of every time conception prevails the adoption of standard ways of dealing with time, coincident with *common time*. It is important that computer studies focus on issues of the sort above mentioned: principally conciseness, extensibility, and processing, which demarcate the difference between them and a philosophical, aesthetical point of view, which search for the meaning of music time elections.

Reviews on Marsden’s substantial work that applies the logic of time to music<sup>400</sup> wonder about its *musical* interest, beyond the fruitfulness of its theoretical contribution. The question is that these studies fail to establish any connection with time ideas in the context of the problem of musical signification. Martin Dixon’s review, more than celebrating literal descriptions of music’s time as a time *taken*, emphasises how important it would be to treat the more fundamental issue of time as *evoked* by music, internally and externally, in the double sense of composing and expressing time conceptions.

Despite all appearances to the contrary, the book is not directly concerned with ‘time’ as such. It does not seek insights into how philosophical, psychological, scientific, or sociological discourses

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<sup>398</sup> Ibid., p. 49.

<sup>399</sup> Ibid., p. 51.

<sup>400</sup> Dixon, Martin, *Music and Letters*, 2002, pp. 511–514. Also Dannenberg, Roger, *Journal of New Music Research*, 2002, pp. 79–81.

have attempted to elucidate the concept of time or demonstrate how such conceptions could usefully be extended to music [...]

Rather, what is being sought is a means of rigorously representing an appropriately desubjectified and dehistoricized chronology [...]

[...] One might wish to venture that in so far as time is implicated in music in ways that distinguish it from ‘actual time’, music may not so much be ‘in’ time, or be measured relative to an abstract clocked time, as act upon time, produce a time for itself, or make time a thematic for its own structure or process.<sup>401</sup>

In this sense, the departure in this inquiry from a purely ontological approach is due to these concerns. This means, logic alone cannot provide here the total explanation for phenomena, which are ultimately aesthetic, but it is recognised as affording a neat explanation of an important part of its functioning. The logical base is still important in that it inserts and links musical time issues within the traditional philosophical discussions about time, untreated in a systematic way by musicology.

#### **4.3.1.2. Exploring the Formalisation of Timing in Music**

In musical computation, temporal logic serves not only to describe ‘external’ relations of temporal order such as linear, circular, etc. as they were introduced above. It is also useful for representing ‘internal’ time situations. Recently, Marsden has applied temporal logic to explore the issue of timing in music.<sup>402</sup> This logic is required for modelling the listening process in general, for memory and anticipation in actual situations, as Kunst does (developed in 4.3.2.1) and in particular, for questions of actual timing, either in the design of automata to create/perform music in real time or ultimately, to reflect the human cognition of timing. In this paper Marsden explores precisely the latter case.

Temporal logic has been exploited linked especially to the design of automata, which are programmed to be used in real-time contexts. For example, the logical requirements that a burglar alarm has to fulfil are expressed in this type of logic:

Temporal logic can function not only as a quasi-mathematical problem-solving device, but also as a language for the description and design of automata and computer systems. Indeed, there have been substantial research efforts to develop temporal logics for use in the specification and design of real-time systems, especially where proof is required that the system will work safely.<sup>403</sup>

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<sup>401</sup> Dixon, 2002, p. 512.

<sup>402</sup> Marsden, 2007.

<sup>403</sup> Ibid., p. 175.

Formulas of the following sort then, are precisely operative for designing a burglar alarm:<sup>404</sup>

$$S(A \wedge B, A) \rightarrow U(\sim A, X), \quad (1)$$

$$\sim A \rightarrow \sim X \quad (2)$$

**A** is true when the alarm is set

**B** is true when there is an intrusion

**X** is true when the alarm sounds

### **Since, Until**

The treatment read in Marsden before, that of temporal logic in music computation depending on abstract temporal relations in an ‘out-of-time’ perspective, is again mentioned to contrast this new application:

The score represents temporal relations in an abstract time, which can be related differently to actual times in different actual performances. The performer’s memory and anticipation, on the other hand, on which her or his performance relies, refers implicitly to the time in which the performer lives. These two kinds of temporal representation are referred to as ‘in-time’ representations for those cases where reference is made only through memory and anticipation, and ‘out-of-time’ representations for cases like a musical score.<sup>405</sup>

The purpose in this article however, is to generate “a conceptual exploration of formalising the requirements of automata capable of musical timing.”<sup>406</sup> This means his goal is to underline the mathematical rigour and to provide the necessary elements for the design of correct proofs in order to write effective software for music.

The temporal logic within the in-time perspective that Marsden uses particularly works with the operators *S* (Since) and *U* (Until).

$$S(A,B)=\text{def } \exists t((t < \mathbf{now}) \wedge A(t) \wedge \forall s((t < s < \mathbf{now}) \rightarrow B(s)))$$

B has been true Since A

$$U(A,B)=\text{def } \exists t((t > \mathbf{now}) \wedge A(t) \wedge \forall s((t > s > \mathbf{now}) \rightarrow B(s)))$$

B will be true Until A

Marsden opens to the reader a paradigmatic triangle-player problem, which is a matter (very familiar to musicians) of coordination. “Note x must be played at the same

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<sup>404</sup> Ibid., p. 176.

<sup>405</sup> Ibid., p. 174.

<sup>406</sup> Ibid., p. 176.

time as note y, using the timing information conveyed by the preceding notes a, b, c, [...]"<sup>407</sup>

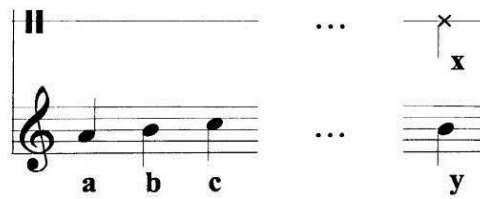


Figure 2

A simple formula could help to describe the situation:

$$P(P(A \wedge B) \wedge C)$$

However, the requirements a mathematical formalism has to fulfil to describe such a situation are of the following type:

- Intervals must be specified and must be of an equal nature and of certain range
- The formula must avoid intrusions between notes such as silences, notes, same notes doubled.
- The formalism has to avoid other notes in addition to a, b, c.

Marsden describes levels of logical requirement for musical timing according to three types of schemes: one for discrete time, one for dense time, and one using the ontology of time periods. These three levels are in correspondence with three levels of focus: the level of the design of automata imposing some quantization of time, the higher-level implementation of automata with different actual quantizations of time, and the last one, appropriate for describing human cognition on timing. Complexity in formulae decreases from the lowest to the highest levels of focus, while the implementation mechanism is assumed to do the opposite (mechanisms tend to be more complex, e.g. think about that describing human cognition).

To conclude, Marsden comments on the importance of meter and timing for music in general:

It is possible for timing in ensemble performance to be determined by other means. In Lutoslawski's Preludes and Fugue for 13 Solo Strings, for example, players watch a conductor for a signal to stop repeating a segment of music. In Cage's Two for two pianos, the pianists must wait for each other to complete one segment before they start another. However, I do not know of any

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<sup>407</sup> Ibid., p. 174.

case where two musicians are required to cause sounds to happen at the same time without using a metre to facilitate co-ordination.<sup>408</sup>

Timing certainly has a philosophical counterpart in studies which have emphasised the relation between mood and interpretation; also in personal, characteristic timings; finally, in the much more general sense of performance as a medium of self-construction. Although the formal design or philosophical related discussions about timing are a core for investigations on time in music, not much is explored for the rest of this thesis.<sup>409</sup>

The difference between Marsden's research and the present thesis is that here the technical view is not pursued. This thesis is committed to inscribe into a philosophico-logical view, to offer a rational account but ultimately pinpointing an aesthetic realm. Marsden focuses on temporal logic for formalising the representations of musical time available to the computer engineering field, for a possible comparison of their advantages as well as, in this last article, for exploring the formalisation of timing in music. This thesis emphasises on ontological questions concerning musical time, to enlighten ultimately the topic of musical signification in the form of conceptual ideas coming out of the internal structure of the pieces.

### **4.3.2. Temporal Logic Applied to Music with a Philosophical Perspective**

This section is, on the one hand, connected to the preceding one in that logical tools continue to provide the frame for research on music. On the other, it presents its own position concerning music, time, and logic. It intersects also with the ideas expressed in 4.2 on musical logic, extending them. Here, an idea of musical logic is devised via concepts inspired by temporal logic. Up to this point, while the first approach of music-as-logic (4.1) was unconvincing because of its metaphorical sense, the one developed in 4.3.1., is not convincing since it omits the treatment of the idea of the logic of time in music as key for providing an answer to the problem of musical signification.

Section 4.3.1. searches for a logic of time in music that could be technically manipulated. A great deal is obtained from this perspective: accuracy in representations of musical time. This last enterprise, undertaken by Marsden, does not suffice alone in

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<sup>408</sup> Ibid., p. 188

<sup>409</sup> Remember Hegel and Langer's passages from 1.1. Also Wagner, with his understanding of rhythm as a social science.

order to underline the primary meaning of music as temporal art, i.e. as teaching us something about time in the sense Marvin Minsky thought, and it is here conceived by adding some extra thoughts: that it teaches us about inner time and general time, which is the key concept of philosophies of existence and of nature.<sup>410</sup> The profound repercussion of music in our lives could be related to this primary signification.

In contrast to the phenomenological approach, the logical treatment of musical time is supported and recognised as a basic level of representation. This treatment acquires at a more conceptual level other necessary definitions and extra supportive work. That is, the reading of the main axioms of temporal logic according to a musical, rather than to a purely logical, perspective. This means, when speaking about linearity, that not only ‘connexity’ is necessary to represent with fidelity what happens in the music, but a sort of ‘becoming’, the passing from an unexpected moment to its resolution. Modifications also occur in the cases of circular and branching times. In music, except in extreme cases of minimalism, each iteration of circular repetition is not identical, not the *same*, but *similar*. In branching music, it is the ‘actual’ branching which is the most aesthetically relevant concept showing the proliferation of ‘musical worlds’ than its ‘potential’ sense, where a piece ends inevitably following a single line of actions.

It has been noticed that *musical time as perceived* can have different meanings: it can refer to the listening process in general (as Kunst studied and is presented immediately below), or it can be shown as suggesting listening strategies according to the different temporal modes, the shapes of time in music specifically. These topics have been developed either from the phenomenological and psychological sides or from a formal perspective. Regarding the first formal approximations, Kunst’s thesis and recently Marsden’s as it was presented above, are considered precedents in the formalization of time as perceived in listening via the use of temporal logic.<sup>411</sup> From these works, only Kunst related his search to the topic of musical signification, in the sense of the epigraph transcribed at the beginning of this thesis. At this stage, this thesis attempts to develop an interpretation of Kunst’s ideas that “may take root, flourish and breed” in music, interpreting the ‘something’ music is useful for, as uncovering modes of time, the time in which we inhabit and think about having different possible organisation and nature.

There are few works on this aspect of musical time in both groups, logicians and phenomenologists, as judging from the following quotations:

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<sup>410</sup> Minsky, 1981, pp. 39–40.

<sup>411</sup> In Leman, Marc, “Dynamical-hierarchical networks as perceptual memory representations of music,” *Interface*, 1985, pp. 125–64, there is developed a formalised model of the listening but not through temporal logic.



How should the phenomenological description of time in music proceed—should such description be formalized or should it be left free? Although many of these issues will certainly not be resolved in the immediate future, the work that has already been done by theorists has opened up a rich source of questions and possibilities which will hopefully stimulate and enrich the field of music theory for many years to come.<sup>412</sup>

In turn, Marsden writes:

A formal treatment of musical time as experienced is the most important area not covered in this study. [...]he ‘in-time’ location of the observer makes representation of this aspect of musical time quite a different matter from the ‘out-of-time’ perspective taken in this study. Different logical mechanisms, such as the indexical and modal logics [...], would be required for such an enterprise, and some formal work along these lines exists already (see, for example, Kunst, 1978, and Leman, 1985). For the present, however, it must remain the topic of a different study.<sup>413</sup>

The hybrid goal of this thesis is developed in the basis for a formalization of the phenomenological described temporal modalities—not the formalization of the listening of music (Kunst) or its timing (Marsden). The goal is to arrive at a sort of scheme of time in the music analogous to, for example, what Schenkerian theory achieved for tonal music, i.e. to exhibit the bones of the musical structure in time as a basic interpretation of the meaning of the work. With this, musical ‘coherence’ can be grasped not only as a byproduct of the tonal-harmonical linear structure but also of the cyclical or branching ones, expanding the traditional notion of musical logic, as developed in 4.2.

One objection could immediately appear and it is certainly not a minor one. This thesis includes the topic of musical time inside the chapter on ontology of music. Now, it includes the logic of time in the chapter on musical logic. All this, without clarifying important assumptions. Musical time is conceived here as having logical, cognitive, and aesthetic value. It is assumed, then, that there is no possible division of these aspects in order to see time in music as music’s primary meaning. In other works, namely Marsden, the logical value is emphasised and therefore, music and time are explicitly dissociated, for time is a supra-order, applicable to domains other than music as well. Marsden thus separates himself from Kramer and phenomenologists who tended to blur this division, resulting finally in the equation of time and music. In Marsden’s case, a similar objection could apply: without a division results in conceiving the logic of time in music as a musical logic itself. We are not implying that music operates with radically different terms in comparison with ‘real’, in the sense of ontological and

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<sup>412</sup> Beaudreau, 1989, p. 161.

<sup>413</sup> Marsden, 2000, p. 169.

formalised times. But we still want to emphasise the idea that music shows this in a peculiar manner.

On the cognitive value of musical time, Minsky arrives at the conclusion that music teaches us about time, and this opinion will be supported here with the above mentioned addenda. Concerning the aesthetic value of musical time, phenomenologists have implied it in several applied studies on how different historical periods, different composers, and different works have had Time as *motto* to inspire their creations; an election which has been accelerated and commented on more emphatically during the last century. This condition does not exclude the idea that time is at the basis of all music and that can be found intrinsically in the music itself.

Marsden's study exemplifies a case in which temporal logic applies to a kind of reflection about music. By the way, Marsden himself leaves open the door for ulterior treatments mentioning other important ways of using temporal logic means in music analysis, remember the "formal treatment of musical time as experienced",<sup>414</sup> which constitutes, at the same time and slightly modified, the goal of this study. This brief sentence will be adopted here, as interpreting the syncretism of the present project concerning existing studies on musical time: phenomenological and logical developments are linked under the same proposal.

#### **4.3.2.1. Kunst's Formal Pragmatics of Music**

Jos Kunst's (1936–1996) dissertation *Making Sense in Music* (1978) is considered among the main antecedents for this inquiry. His rational approach to musicology and his aim of integrating his investigations into a more general philosophical framework are the first basic similarity. The difference however, is that he neither intendeds to provide any philosophical interpretation of temporal conceptions hidden in musical works or link the formalisation of the listening process to any concrete idea of time, nor to enter into the topic of musical time in the philosophy of arts or musicology itself.

##### *The Trichotomy of Signs Extended to Percepts and a General Sense of Pragmatics*

To arrive at his primary aim of describing a formal pragmatics for art in general and particularly the problem of 'making sense in music' (i.e. of musical understanding and meaning, that is a formal pragmatics for music itself), he deals firstly with important

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<sup>414</sup> Id.

issues that this thesis already visited under the chapter of philosophy of musical language. He departs from a basal definition of a ‘percept’ (in opposition to ‘concept’). Concepts are defined as “a recognitional capacity of any sort” and percepts as “a set of incoming data which is sufficiently structured to admit of the discrimination: it can, or it cannot, be matched with some conceptual structure.”<sup>415</sup> Percepts are interpreted under an extended, in the sense of a more general, including the non-verbal field, i.e. surpassing ‘concepts’, notion of the Morrisian trichotomy of signs (syntax-semantics-pragmatics). Thus, a percept would have syntactical, semantic, and pragmatical interpretation as in the following example:

The sound of rain outside can be heard and recognized as such by me: it is then found well-formed and interpreted semantically [...]. It also admits of a pragmatical description: a description of the change effected by it. In such a description may then loom large such questions as whether I brought my umbrella with me or not: in one case I may still feel free to go as I please, in the other I may know myself to be marooned where I am—until the rain stops, that is.<sup>416</sup>

Kunst uses a more general notion of pragmatical meaning, interpreting Richard Montague’s (1930–1971) definition as severely restricted even for language, and expands this to the theory of art: “[T]he most general approach would be, I take it, to require that a pragmatical theory describe, for each sentence/utterance, the change effected by its use, e.g. through comparing ‘conceptual state’ descriptions (before vs. after).”<sup>417</sup>

Montague’s gives the truth conditions for sentences containing indexical expressions: it is a semantics incorporating special context-dependent (“pragmatical”) variables. Proposals made by theorists of literature [...] involve formulation of what is called “adequacy conditions”; they seem to presuppose the existence of systematic relations between utterances and contexts to which they are “adequate”. Now whereas there may exist some such systematic relations which are typically governed by (more or less general) conventions, we would not recommend the general use of such a concept of pragmatics, not even for the whole written verbal language.<sup>418</sup>

Kunst rejects, under this particular pragmatical approach, any syntactical or semantic approach to musical meaning altogether. The question of correctness and that of the native speaker competence present serious difficulties of being described in music with similar terms (this, although written before Lerdahl and Jackendoff’s theory of 1983, would seem to predict their results as stated in the final chapter of their work). No semantic meaning could be grasped with certainty either, unless one could speak in

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<sup>415</sup> Kunst, 1978, Preface.

<sup>416</sup> Id.

<sup>417</sup> Id.

<sup>418</sup> Id.

verbal terms about the meaning of the non-verbal. (These matters were already discussed in Ch. 3).

At this stage, Kunst quotes ideas by Meyer as one important antecedent, for having thought ‘meaning’ heavily fraught with pragmatic aspects: “[I]n order to know what a given musical object means I have to know the past of the given music, its ‘background’, the musical laws embedded in it, and I must continue on to extrapolate that past into the future.”<sup>419</sup> Meyer had said:

[W]hat a musical stimulus or a series of stimuli indicate and point to are not extramusical concepts and objects but other musical events which are about to happen. That is, one musical event (be it a tone, a phrase, or a whole section) has meaning because it points to and makes us expect another musical event.<sup>420</sup>

The present thesis adopts the pragmatic point of view for reasons developed in Chapter 3; a purely syntactist vision or the question of universals in musical grammar and that of a musical vocabulary, implied by a semantist vision, are putting aside and the culturally conditioned signs in time are emphasised in this study coinciding with Kunst’s pragmatist thesis.

### *Kunst’s Use of Hintikka’s Logic of Perception*

Following Kunst’s steps, in addition to the extension of the semiotic triad (syntax, semantic, and pragmatics to cover the realm of percepts and of sounds specifically) he introduces Jaakko Hintikka’s (b. 1929) logic of perception, interpreting it as being in a relatively general stage in comparison to his own proposal. Owing to Hintikka’s first insight on the logic of perception however, Kunst finds a more precise difference between natural perception, based on our knowledge of natural laws, and musical, pictural, etc. perception, based on our knowledge of musical, or other kind, ‘law-likeness’. Modal logic that works with the operators of necessity and possibility is reinterpreted and given the case of music, evaluated with the help of tense logics. The use of tense logic in Kunst’s thesis is linked to make clearer Hintikka’s general insights applied now to the music domain.

This apparatus not only yields Kunst a revelation of the structure of listening but ultimately it also unveils the structure of art, providing a formal explanation of our experience with art in general. Moreover, he proposed them to be applied to “all

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<sup>419</sup> Ibid. 0.1.3.

<sup>420</sup> Meyer, 1956, p. 35.

contexts based on convention-determined law-likeness, and hence generally in practical semiotic research.”<sup>421</sup> The method, again, generally aims to provide a *pragmatical* description, in the sense that “it specifies the conceptual change effected by a percept.”<sup>422</sup>

According to Kunst, musical semioticians until then were more interested in describing musical *objects*, e.g. pieces; he is interested instead in musical *activities*:

Then it is the listening process that seems somehow to be the basic one, and thus the one that would serve best as a primitive. Composing would be defined as *designing the listening situation*, and playing as providing *some specifiable physical necessary conditions of the listening situation*. If all this holds water, it is *perception* that we must choose as our starting-point.<sup>423</sup>

Hintikka offered these specialized branches of logics (the logic of perception) as explanatory models “bringing out the ‘depth logic’ which underlies the complex realities of our ordinary use of, e.g. perceptual words, and in terms of which these complexities can be accounted for.”<sup>424</sup>

‘Perception’, in the context of Hintikka’s work,—the same applies to belief, knowledge, etc.—, is taken as a *propositional attitude* of a subject, as expressed by a ‘that-clause’.<sup>425</sup> This perception involves *modal notions* or the consideration of more than one possible world. In this sense, ‘A perceives that *p*’ equals ‘In all possible states of affairs compatible with what *a* perceives it is the case that *a*’. In turn, ‘A does not perceive that *p*’ equals to ‘There is a possible state of affairs compatible with what *a* perceives in which not-*p* is true’. Thus, statements on propositional attitudes are seen as special cases of modality statements.

Kunst had previously used, in a free manner in his exposition about syntax, semantics, and pragmatics of percepts, Hintikka’s ideas about possible worlds semantics. Precisely, to speak about the semantic processing of percepts: “[G]iven the conceptual structures an individual has evolved in his lifetime (his set of ‘possible worlds’ [...]), his semantic processing of a percept specifies those possible worlds which are *compatible* with it.”<sup>426</sup> Coming back to his ‘rain example’, processing that it is raining outside would imply taking into account conceptual capacities (‘recognitional capacities’) acquired along the person’s life. Thus, for a baby, the sounds of raining

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<sup>421</sup> Kunst, Preface.

<sup>422</sup> Id.

<sup>423</sup> Ibid., 0.3.0.

<sup>424</sup> Ibid., 0.3.3.

<sup>425</sup> Hintikka, 1969, p. 155.

<sup>426</sup> Hintikka, 1975, p. 62.

could imply strange (unrecognisable) noises, while for an adult these sounds are ‘matching’ and compatible with raindrops and ‘rain’ as a concept.

Hintikka himself shows the case of disclaiming a perception to clarify how perception involves modality. In this case, both seeing not-*p* and seeing *p* are perfectly possible. Thus, two possible worlds enter into consideration. According to Hintikka, “the notion of (semantical) information is closely tied to that of a possible world: to specify an information content is to specify a set of possible worlds.”<sup>427</sup> This fact influences Kunst in his defence of perception as having a cognitive function. For that *a* perceives more than *b* signifies that “the class of possible worlds compatible with what he perceives is smaller than the class of possible worlds compatible with what *b* perceives.”<sup>428</sup> In the previous example, this class is smaller since it goes from noises to raindrops, specifically.

Kunst still has to provide: “a) different classes of possible worlds, and b) specific relations obtaining between them, in order to display the real strength and fruitfulness of Hintikka’s basic proposal.”<sup>429</sup> He does this using tense logic as the most adjusted modal-equivalent logic for dealing with what music perception requires: not just objects (as it would be for seeing) but actions and events, which are the essence of hearing: processes. The clauses a) and b) above will be explained through the use of temporal logic.

### *Kunst’s Two Notions of Concept Learning*

Generally speaking, non-verbal cognition is defended in its epistemological ‘birthright’ by Kunst’s thesis and this is expressed through a general, not only restricted to verbal language, notion of well-formedness and his proposal of two-kinds of concept learning.

Following his purpose of defending a cognitive status for perception, Kunst introduces Jerry Alan Fodor’s (b. 1935) related notions of concept and perception. “To see something is to find a use for the *concept* I have of it, and, if (as we do) we take a concept to be any recognitional capacity, *to recognize* it.”<sup>430</sup> Perception is interpreted as computational, involving “hypothesis formation and confirmation.”<sup>431</sup> “[R]eading the environment, [...] is to be thought of [...] as a continuous activity of matching incoming

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<sup>427</sup> Id.

<sup>428</sup> Hintikka, 1969, p. 157.

<sup>429</sup> Kunst, 0.3.3.

<sup>430</sup> Fodor, *The Language of Thought*, 1975, p. 44.

<sup>431</sup> Id.

data with the internalized model of the external surroundings: as is proper a computational activity.”<sup>432</sup> A percept well-formedness then will depend on the ‘*attainability*’ of its match with some conceptual structure.

Kunst asks what happened however, if confronted with ill-formed percepts and we reacted by adapting our internal model, consequently provoking the well-formedness of that percept? “If the percept is at all likely to reoccur, it may be the case that the organism has adapted itself better to the environment, and many people will be inclined to say that it has *learned* something useful”.<sup>433</sup> What is of interest in Kunst’s work is that this fact will show two kinds of concept learning. This, having in minds the important goal of defining the peculiarities of art perception against those of normal perception, or of natural laws vs. artistic law-likeness.

Concept learning does not always mean unlearning-plus-learning process. Kunst explains this as follows: “the set of my words in use; the set of my languages in use; the set of people I am acquainted with; the set of objects of which I know what they look like; the set of sounds of which I know what produces them, etc., etc., [...]”<sup>434</sup> they are all part of concept learning which nevertheless does not imply an unlearning-plus-learning processes (from now, Kunst’s abbreviation UNLL). Consequently, he proposes these two kinds of concept learning: one that implies UNLL and one that does not. This last roundabout anticipates the topic of the cognitive value of art, as expressed by the key concept of UNLL and defines in his terms what art is from what it is not.

Poetry offers a paradigmatic example for UNLL processes as described by Kunst. What happens with metre and rhyme are clear cases. ‘Enjambment’ (the continuation of a line of poetry beyond its end) or examples of ‘caesura’ (the breaking up of the lines in many ways) yielding to new meanings, and finally, the effect obtained by pairing sound-forms, creating thus a similarity in their semantic field, are instances of UNLL.

This implies the breaking of conceptual habits, and thus instantiates “unlearning” processes [...]. Secondly, and the emergence of fixed “poetical” styles proves that this may even be a stable long-term process, new concepts are produced: this corresponds to the “learning” processes [...].<sup>435</sup>

The understanding of poetical texts requires at least two conditions: 1. the “knowledge of the natural language used” and 2. the “knowledge of the literary background produced by the culture the text at issue belongs to, in as far as it draws

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<sup>432</sup> 0.5.1.

<sup>433</sup> Id.

<sup>434</sup> 0.5.3.

<sup>435</sup> 0.6.1.

upon it”.<sup>436</sup> In the case of music, 1. the “knowledge of the (non-musical) soundscape” and 2. the “knowledge of the musical background produced by the culture the music at issue belongs to, in as far as it draws upon it”.<sup>437</sup>

Condition 1. is explained by the fact that music includes much more than what a simple reader would think. “Knowing that one is listening to music, recognizing an instrument and a way of playing it, enjoying the (imaginary) muscular exertion and pleasure involved, all these things do not necessarily involve intra-musical concepts, and are thus to be classed under the heading of sound comprehension”.<sup>438</sup> Sound comprehension equals to the first level of *soundscape*.

Kunst exercises two different explanations of natural vs. conventional laws in music. For the example “I hear someone mounting the stairs” he will give the following translation: “I understand a sound of such-and-such description in such a way that the set of possible worlds compatible with what I perceive [...] all exhibit the causally necessary and sufficient conditions for producing that sound”.<sup>439</sup> On hearing a musical behavior, he will then interpret: “I understand it by ‘placing’ it: by relating it to the precedent(s) that make it law-like.”<sup>440</sup> This, it will be seen, happens at both the macro and the micro perspective, i.e. at the level of including the work in a tradition and in a listening perspective of a single work.

### *The Logic of Time for Representing Listening Situations*

Kunst continues here by describing the requirements of any mathematical formalism for the representation of elementary musical listening situations. In principle, there are two levels of understanding whenever one faces a piece of music: the understanding of the musical material and the understanding of the relations between two consecutive elements. This implies “to construct a ‘musical space’ that has got room to accommodate (at least) both A and B and the transition from A to B”.<sup>441</sup>

For that purpose, Kunst notices that the propositional calculus (PC) would be too strong a tool. PC is unable to admit conflicting hypotheses:

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<sup>436</sup> 0.6.2.

<sup>437</sup> 0.6.3.

<sup>438</sup> 0.6.4.

<sup>439</sup> 0.6.5.

<sup>440</sup> Id.

<sup>441</sup> 0.7.1.



In music (as in life at large) these are [...] extremely frequent. The whole idea of “suspending one’s judgement”, but remaining alert all the same, means nothing else than continuing to match all incoming data with (at least) two mutually exclusive hypotheses, which are thus both maintained for a certain time. (Ours is not essentially a one-track mind).<sup>442</sup>

The necessity of a logic that would admit more than one path in the same framework is linked to the interpretation of music as having law-likeness behavior. “A music’s behavior is law-like if it behaves as it always did in the past.”<sup>443</sup> There is still a problem for Kunst here: the question that in any listening-process, a potentially variable or subjective assessment of the law-likeness of music’s behavior can occur. A listener not being acquainted with sonata form, for example, would be surprised and would have to reassess music’s past or would interpret this as not being law-like.

Modal logic finds in listening a candidate for formalising, it works with the notions of the necessary and the possible, and from it stems the possible worlds’ semantics. A greater number of notions come from it, as perception in this case, giving rise to intensional logics.<sup>444</sup> A way of making precise qualifications in modality statements describes relations between possible worlds: the R-relation or ‘accessibility relation’ is the most common: world  $w_1$  has access to world  $w_2$  if  $w_2$  is possible with respect to  $w_1$ .

Priorean tense logic is structurally similar to modal logic. Simply, the possible worlds in tense logic will refer to or represent moments linearly arranged in the time-line(s). In tense logic, the R-relation equals to before–after. Thus, branching time, relativistic time, non-ending/non-beginning time, converging time, circular time, dense/discrete time, etc. will be captured by suitable conditions on R. However, Kunst seems to use a very specific tool from this tense logic and will not deal with possible conceptual ideas arising from these different arrangements of time as it is developed in this thesis. He will re-interpret the Diodorean modalities (introduced below) as previously translated into temporal notions and thus select only this for the representation of listening situations in which unexpected moments in music will be formalised as typical UNLL processes.

There is a contact between modal and tense logic in the so-called Diodorean modalities:

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<sup>442</sup> 0.7.4.

<sup>443</sup> Id.

<sup>444</sup> Gamut, L. T. F., *Logic, Language and Meaning*, 1991. Intensional logics are defined by the key notions of ‘context dependence’ and ‘multiple reference’, pp. 13–15.

Necessarily A=both now A and always in the future A (or, in current tense logical notation, ‘ $A \wedge GA$ ’, where  $\wedge$ = conjunction and G= always is Going to be)

Possibly A=either now A or at some time in the future A, or both (in tense logic ‘ $A \vee FA$ ’, where  $\vee$ = disjunction and F= in the Future)

Kunst operates a simple transformation of the Diodorean modalities by turning ‘180° (to the past)’ the available graphic model of branching towards the future that represented time-lines, possible courses of events. As Kunst reformulates them, Diodorean\* modalities to be applied to music listening, are defined in the following terms:

$\Box A$ =the music has now behavior A and has always had it in the (its) past ( $\Box A$  is a musical law now obtaining). Where  $\Box$ =operator for necessity

$\nabla A$ =either the music has now behavior A, or had it at some moment(s) in the (its) past, or both (A is not forbidden by any musical law now obtaining; no law  $\Box \neg A$  (or, alternatively,  $\neg \nabla A$ ) can be asserted). Where  $\nabla$ =operator for possibility and  $\neg$ = negation.

This is for a model-theoretic way of describing. Concerning the axiomatics, Kunst imposes the following plausible conditions to models of musical listening:

1. The reflexivity of the relation R:

1. “[W]henver at such a moment or ‘point in musical space-time’ a musical behaviour A arises, it will interfere, at that moment or point of musical space-time, with the formation and/or disruption of ‘musical laws’.” Alternatively, “whenever at some point in musical space-time a law is asserted, there cannot be, at that point no more than at any other point accessible from it, any behaviour that goes against the law asserted.”<sup>445</sup>

2. The transitivity of the relation R

2. “If at any given point  $w_i$  of musical space-time I have access to some points that constitute its past, then, at all points in  $w_i$ ’s future, not only  $w_i$ , but also its past remains accessible to me. Consequently, if at any given moment we have p, then at all moments in the future of that moment we will have (at least)  $\nabla p$ .”<sup>446</sup>

3. The assumption of special cases, in the form of so-called ‘non-normal’ worlds:

3. “Among the numerous ‘laws’ that one may construct in understanding the behaviour of any given piece of music, there will be a certain number that have a purely ad hoc character, viz. the laws that govern

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<sup>445</sup> 1, 1.2.1.

<sup>446</sup> 1, 1.2.2.

those aspects of the piece that guarantee its recognizability, its uniqueness. [...S]ome aspects of any music's behaviour assure its inner coherence, and not its coherence with the cultural background embodied by previously heard musics."<sup>447</sup>

[...T]he absolute *arbitrariness* of all things true in n.n. worlds is taken by us, in our interpretation of them, to be one of the main features determining their usefulness in our models. They reflect the newness of new musical behaviour, by showing on the one hand its initial lawlessness with respect to musical laws, and by permitting on the other hand suitable new musical laws to be worked out later, and in retrospect.

[...A]s reflecting the *conventional* character inherent in the framework of musical thinking. Indeed, we may, in the Diodorean\* perspective, find some music's behaviour law-like by reference to some earlier music; this earlier music may again be law-like in the same way and so on; but this process cannot go on indefinitely [...].<sup>448</sup>

This fact is expressed by:  $\neg \Box \Box p$  of any musical law it is true that it did not always obtain.

This squares beautifully with our intuitions about conventions, for it says that all law-like situations are preceded by some situation(s) characterized by arbitrary decisions:  $p$  was true in them, but not because any law  $\Box p$ , which did not obtain.<sup>449</sup>

### *Kunst's Bivalent Functions and Networks ('Pragmatical Maps') for Musical Listening*

The following step in Kunst's thesis is the presentation of his diagrams, which will evolve as large networks representing listening situations, or 'pragmatical maps' as he calls them, collecting the extended notion of pragmatics from the beginning. Kunst's diagrams have for their construction the following rules:

- A. The direction of the past will be toward the top, that of the future toward the bottom.
- B. Worlds, or points in musical space-time, will be represented by rectangles, and labelled according to the vertical columns and horizontal ranks in which they occur, by superscripts and subscripts respectively. Thus,  $w_{12}^{12}$  will be the world situated at the intersection of column 12 and rank 7.
- C. Formulas in a rectangle will state truths-in-that-world.

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<sup>447</sup> 1, 1.2.3.

<sup>448</sup> Id.

<sup>449</sup> Id.

- D. The relation R is pictured by arrows, in such a way that an arrow pointing from  $w_j$  to  $w_i$  indicates that  $w_j$  has access to  $w_i$ . In view of rule A it is clear that, given our Diodorean\* interpretation, all arrows will point upwards.
- E. Reflexivity and transitivity of the relation R will remain implicit throughout.
- F. Non-normal worlds will [be] represented by double-lined rectangles.<sup>450</sup>

A central notion introduced by Kunst's thesis is that of the Bivalent Function: "What a BivF takes on to represent is the cognitive frame within which a change of value of some semiotic unit may take place."<sup>451</sup>

A list of symbols that appear in formulas in the diagrams plus propositional letters or variables  $p$  and  $q$ :

Apart from operators of Necessity and Possibility already introduced, and symbols of

Negation, ' $\neg$ ': Not ...

Conjunction, ' $\wedge$ ': Both ... and ...

Disjunction, ' $\vee$ ': Either ... or ... or both

Also,

Implication, ' $\rightarrow$ ': If ... then ...

Strict Implication, ' $\Rightarrow$ ': Always, if ... then ...

Equivalence, ' $\leftrightarrow$ ': ... if and only if ...

Strict equivalence, ' $\Leftrightarrow$ ': Always, ... if and only if ...

Brackets: ()

The formulas are described as "conceptualization of a given musical process/event."<sup>452</sup>

Thus,

' $p$ ' means 'I conceptualize this event as (being)  $p$ ', or 'I hear  $p$ -ness';

' $\neg p$ ', 'I conceptualize this event as (being) not  $p$ ', or 'I hear 'not- $p$ '-ness';

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<sup>450</sup> Id.

<sup>451</sup> 2, 2.5.1.

<sup>452</sup> 3, 3.1.2

‘ $p \wedge q$ ’, ‘I conceptualize this event as (being) at once both  $p$  and  $q$ ’ or ‘I hear ‘both- $p$ -and- $q$ ’-ness’;

‘ $p \rightarrow q$ ’, ‘I conceptualize this event as (being) such that if it is  $p$ , then it is  $q$ ’ or ‘The way I hear it,  $p$ -ness implies  $q$ -ness’<sup>453</sup>

The *two-place function* (Figure 3) is exemplified by a simple example: let us suppose you hear low tones below middle  $c$  followed by a higher tone played by a piccolo,  $d$ ’ exactly, which actually is the lowest tone for the instrument but not in the context (of notes below middle  $c$ ) in which it is heard. At a first moment of the music one listens at  $p$ =‘there are only low tones’. Then, when music advances,  $q$  is maintained: ‘all instruments use their lowest register only’. The switch from the moment in which one hears only low tones to that when the lowest pitch of the piccolo appears, but outside the usual register within the context, is represented by the statement: ‘it is not the case that there are only low tones’ or ‘there is (at least) one no-low tone’. In consequence, the law that in one moment was current has changed in another (after having been broken). However, it is not only that first we had one value and then another.

Although the semiotic unit concerned had one of its values before, and, in principle, only the other after the UNLL process, it cannot be properly understood without taking into account the exact way in which two perspectives, two contexts, for a moment intersected on it.<sup>454</sup>

In the case of the examples reproduced here, the moments of intersection would be, for the case of the two-place BivF, when the low tones in the piccolo are discovered as paradoxically higher than the others in the context. In a three-place BivF as will be shown next, the intersection moment is in the passing through the pivot note/chord to a second tonality.

What is involved in this kind of change is the following axiom<sup>455</sup>:

$$\neg(\diamond \square p \rightarrow \square p) \leftrightarrow \diamond \square p \wedge \neg \square p \leftrightarrow \neg \square p \wedge \diamond \square p$$

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<sup>453</sup> Id.

<sup>454</sup> 2, 2.5.1.

<sup>455</sup> 2, 2.0.1.

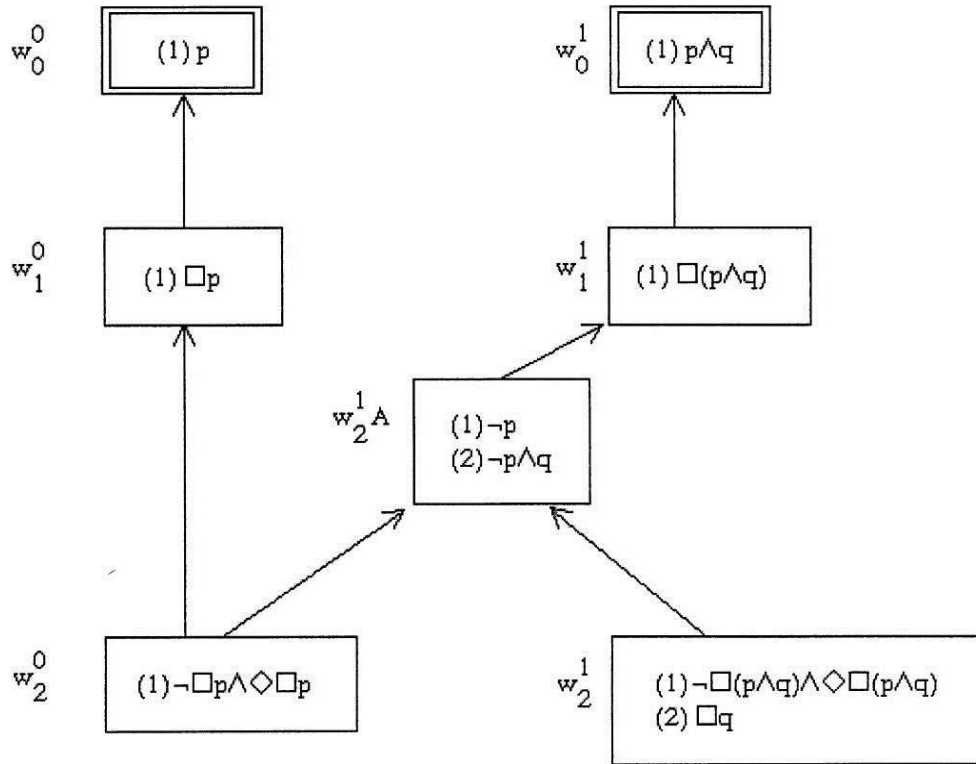


Figure 3<sup>456</sup>

The *three-place function* (Figure 4) is rather complicated but involves very interesting cases. The three-place function describes situations free from the assumption that the first laws attained in the listening situation<sup>457</sup> are going to be held for long (thus, provoking the symmetry of power between right and left columns in the diagram). The example of modulation for this three-place function is the most familiar one described by Kunst. Here one should read a=we have tonality (key) T; b=we have some specifiable succession of notes or chords ('pivot' notes or chords); c=we have tonality U.

<sup>456</sup> 2, 2.0.2.

<sup>457</sup> In the case of the previous example, 'there are low tones'.

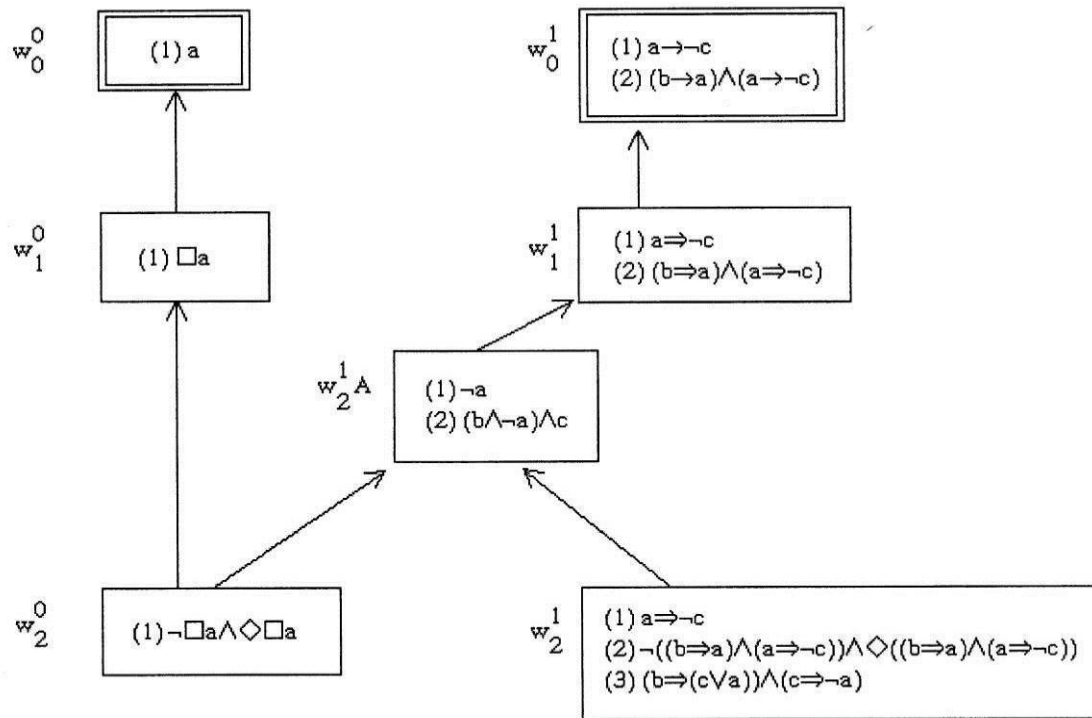


Figure 4<sup>458</sup>

BivFs are interpreted generally as “*minimal buildingblocks for labyrinths*”.<sup>459</sup> This function serves for explaining not only musical processes but also poetical, pictural, etc. What is involved in Kunst’s idea is the formalisation of our understanding of music. He goes on and applies this minimal model to large pieces of music, aiming to develop a meta-language for comparison and hypothesis of larger understanding.

Something has to be noticed however in Kunst’s work, as it has been incorporated to this point and not in the immediately above one on music and computation. Kunst’s thesis also represented a contribution to the computer field, i.e. “[...] the basis for a (computer implementable) modelling of specific music listening processes”.<sup>460</sup> However, his work as a whole is mostly contributing to aesthetics. So, in this sense its discussion is situated at this point in the chapter.

[...]Finally, [Kunst] returns to the broader issue of art in general. It endeavours to narrow down the interpretation of the Bivalence Function in such a way as to make it a suitable *definiens* of art-as-we-perceive-it. It is shown that the primitive concepts of Hintikka’s perception logic, combined

<sup>458</sup> 2, 2.3.2.

<sup>459</sup> 2, 2.5.1.

<sup>460</sup> Preface.

with David Lewis' definition of the notion of convention and with our Bivalence function notion, actually suffice to give an interesting definition of art in that sense.<sup>461</sup>

The UNLL process as described by Kunst certainly approaches in a very elegant way the listening process of musics which are governed by a linear time conception. An example of this is the author's use of Chopin's op. 28, No.7 (*les Sylphides*).<sup>462</sup> Figs. 5a and 5b show Kunst's networks for the listening of this piece.

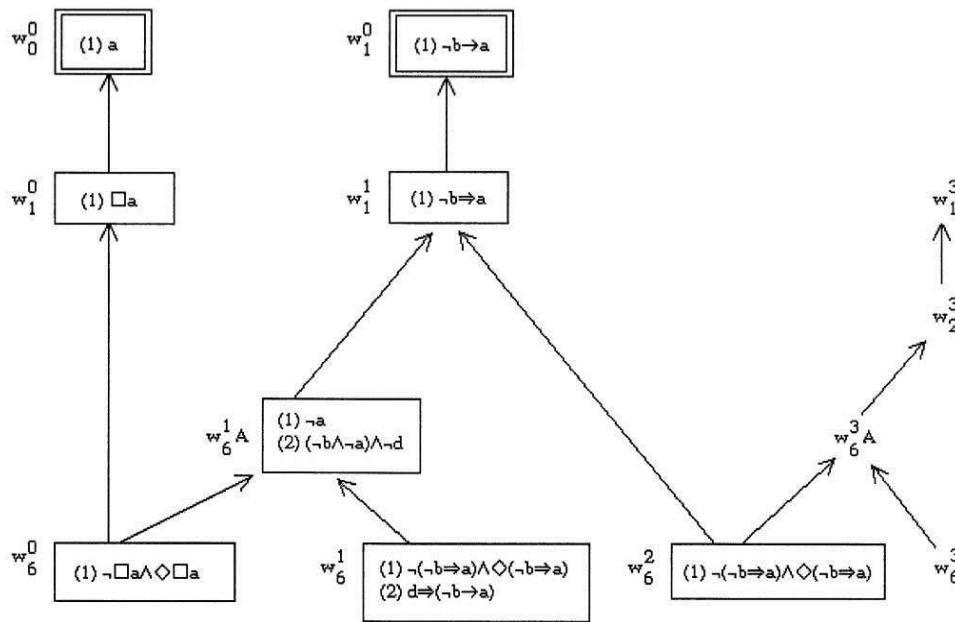


Figure 5a<sup>463</sup>

<sup>461</sup> Preface.

<sup>462</sup> 3.2.2. Score in Kunst's Appendices at: [http://www.joskunst.net/proefschrift/proefschrift\\_8.html](http://www.joskunst.net/proefschrift/proefschrift_8.html)

<sup>463</sup> 3.2.3.



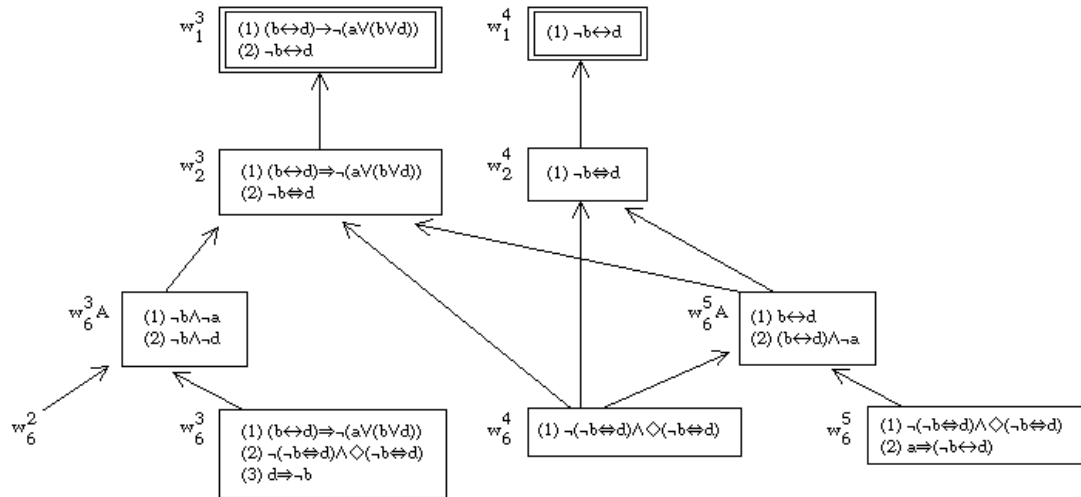


Figure 5b

a...belonging to the melody

b...motionless (as for pitch)

d...belonging to the first half of each statement:<sup>464</sup> quarter note/eight note/sixteenth note with dot/quarter note

Translations of some of the logical formulas in the graphic to facilitate the reading:<sup>465</sup>

Figure 5a:

$\sqcup a$ : “In this music there is only melody”

$\neg b \Rightarrow a$ : “Whenever there is motion of an appropriate sort (in this case: whenever, within a statement, the music ‘goes from one pitch to another’) this motion is melodic”

$d \Rightarrow (\neg b \rightarrow a)$ : “The foregoing law is restricted to the first half of each statement”

<sup>464</sup> Kunst divides the score in ‘statements’. Statement 6 is the ‘pivot’ one for the change of interpretation alluded in the BivF designed.

<sup>465</sup> Ibid., pp. 4–5, (12).

Figure 5b:

$\neg b \leftrightarrow d$ : “Motionlessness through two or more attacks never occurs in the first half of each statement; outside it, it is always there”

$(b \leftrightarrow d) \Rightarrow \neg(a \vee (b \vee d))$ : “If the foregoing law is broken, this only happens outside the melody, and by motion outside the first half of a statement”

$a \Rightarrow (\neg b \leftrightarrow d)$ : “It (the law mentioned in the last item but one) continues to hold within the melody”<sup>466</sup>

In this example Kunst shows the change of meaning of the concept of melody: first it includes all the music to be heard, but later it assumes the other ‘motionless’ material as belonging to it. Also it shows a change in the concept of motionlessness: from a quasi-melodic sense of ‘motion’ from which to extract the opposite ‘motionlessness’ concept as non-melodic, to a weak sense of motionlessness as melodic, (c.) “we have (weak) motionlessness iff, in a chain of two successive attacks occurring within a statement, there is one which has the same pitches as the foregoing.”<sup>467</sup>

Figure 5a evolves from the fact 1) that there is melody, which is opposite to statism and that this law is applied to the first part of each statement according to the score, to the fact 2) that not always that there is movement there is melody and only sometimes there can be movement and melody.

Figure 5b evolves on the other hand from the fact 1) that there is melodic movement if we are in the first part of the statement. Also, if there would be no melodic movement (weak movement), it would be out of the melody and part of the first statement. With this, we arrive at 2) this weak movement belongs to the melody.

In consequence, the diagram exhibited shows listening as evolving from naive accounts of the piece (= melody as belonging to half part of the statements only), to more sophisticated ways of listening (to include motionless as weak motionless having melodic value).

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<sup>466</sup> Chopin, op. 28, nr 7, Note 2.

<sup>467</sup> 3.2.6.

#### **4.3.2.2. A Philosophico-Logical Approach for the Temporal Signification of Music**

Kunst arrives at the question of musical signification via modal logics; in Chapter 5 the question of musical signification is tackled via hybridization between logical developments and phenomenological descriptions of musical time.

Processes of the type exhibited through Kunst's BivF are those corresponding, in the context of this thesis, to the linear logic of musical time. However, how could BivF explain listening situations in which an evocation of permanence is pursued as an aesthetic purpose, instead of 'becoming' or working with expectations? On the other hand, what happens with music evoking many musical times as if many worlds would proliferate simultaneously? Maybe to satisfy the definition of music firstly and following Kunst, that they have to be described by a BivF. So there can be a sense in which BivF also applies for this music. However, concerning the temporal signification of those works, this logical description seems insufficient. While Kunst elaborates his diagrams for conceptualising the listening, here the conceptualisation is applied to temporal ideas behind the work.

This section presents a hierarchy of temporal levels of organisation in musical works. It elaborates, on the one hand, the idea of classifying music as linear, circular, or branching (with the corresponding subdivisions developed in Ch. 5) and on the other, it appears as a more comprehensive picture on musical time.

Focusing on the continuation of Susanne Langer's theory of the dynamics of feeling in *Philosophy in a New Key*, followed by her idea of music as the image of our temporal essence in *Feeling and Form*, Langer moved from the particular symbolic nature of music, its own 'logic', to the question of the analogy of music with inner life. According to Enrico Fubini,<sup>468</sup> the result is that her primary goal of defining the rules of the artistic symbolism in music, particularly to rescue music from that ineffable sphere, of measuring it by the reputation acquired by discursive language, is abandoned in favour of an intuitivist view in 1953. She ended believing that the form and significance of music were ultimately intuited. Although this is not totally objectionable, what might be so is to apply an intuitivist philosophy to reasoning about.

This final intuitivism should be mitigated. What if one replaced that 'logic of feelings' by a logic of time, following her treatment in *F&F*, already in a more extended version, i.e. music is conceived here not only as a semblant of inner time but other times, and at the same time answered to what she had stated in *PNK*? This logic of time

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<sup>468</sup> Fubini, 1990, pp. 358–364.

in music could not only *represent* time (as temporal logic serving computational purposes showed amply) but instead clarify for us how music *symbolises* time as its aesthetic goal.

According to Langer's ideas in *PNK*, a 'symbol' shared with its object a similar 'logical form'.<sup>469</sup> The mapping between the symbol and the object is effected by 'projection rules', which make one to resemble the other. Following these thoughts, and if as stated, music symbolises time, temporal logic rules could be the rules of projection that make the symbol (music) be the symbol of that object (time). If symbol and object were the same (as it could be deduced from Marsden's treatment of temporal logic rules as representing music) then each would be symbol of each other. Symbols have to lack something from objects to be so; music cannot be described only from a strict comparison with ordinary time if it is conceived as an aesthetic object. To apply temporal logic tools to music, these rules first have to be slightly modified or translated.<sup>470</sup>

The hybrid hypothesis defends a balancing view between phenomenological and ontological trends, to answer questions about musical time. This view recognises ontological representations are possible and valid (contrary to what philosophers like Bergson and Langer thought) but limited to technical purposes. Phenomenological analyses are valid when the goal is the explanation of the aesthetic side but end in a sort of intuitivism. The strict application of temporal logic to the domain of music explains the mathematical organisation of its disposition in time and allows for calculations on music. However, it offers no reflection on the aesthetic intention or the symbolic aspect of musical time, either as cultural or ideological content of the music.

The sense that 'logic' acquires here for the moment is then of a wide nature. Having mentioned the possibility of applying logic in a strict way, and leaving the wrong idea that music could be interpreted straightforwardly as having the logic of discursive language, we offer instead an idea of a 'musical temporal logic' departing from the tradition of musicological studies as defined in 4.2. This tradition searched continuously for an idea of logic that was exclusive to the music domain.

Still Langer reflects:

[M]usic presents reality no more directly than philosophical discourse, but it presents a sentient and emotional reality more adequately in a non-discursive image—*globalement*, as the French would say. With this tool it does exactly what he [Bergson] demanded of *la vraie métaphysique*, except one thing: to give a discursive account of itself in the end. That would be eating one's

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<sup>469</sup> Langer, 1942, p. 228.

<sup>470</sup> See Budd, Malcolm, *Music and Emotions: the philosophical theories*, 1985, pp. 106–107.

cake and having it too; and for this reason art is neither philosophy nor a substitute for philosophy, but is itself an epistemological datum about which we can philosophize.<sup>471</sup>

Here Langer defends the position that music presents more directly ‘sentient and emotional’ capacities than discursive language, which is objectionable. To be precise, if discursive language pretends to get a convincing picture of music it can obtain it by applying the logical developments available to temporal logic since 1960, with some necessary modifications. These explanations do not replace music (they do not pretend to!) and treat music as the epistemological datum Langer refers to. The consequences of following Langer’s methodology of thought completely, is that philosophy of music would be indistinguishable from music, something that surprisingly Langer wants to avoid at the end of quotation, but she does not seem to attain through her theory.

It is possible to object to the idea of deriving signification exclusively from time ideas. For standard listeners it is more common to associate meaning to emotions than to time ideas, as philosophy of music nowadays would agree. The link between ideas of time with the dynamics of feeling could be treated by defining Langer’s qualitative forms of lived time with the help of the theory of the *UST* (Temporal Semiotic Units).<sup>472</sup> Otherwise, with no connection between time patterns and emotive life we would be coming back to Hanslick’s ‘silhouettes’, ‘arabesques’<sup>473</sup> as explanation of musical meaning, now simply as ideas about time. And at this point it must be said that Formalism failed in some sense at reproducing the immediate repercussion of music in humans, that beauty is explained in terms of form is only part of the explanation for that frequent human commerce with listening to music, something recovered by Enhanced Formalism in the spirit of Langer and others.

The theory of Temporal Semiotic Units temporally expresses that music reproduces the ‘logic’ of our inner life in terms of motion/rest, tension/release, excitation, sudden change, etc.: ‘dive’, ‘which moves forward’, ‘desire for movement’, ‘erring’, ‘inexorable trajectory’, ‘floating’, ‘stationary’, ‘suspension’, ‘fall’, ‘suspense-interrogation’, ‘obsession’, and ‘brake’. These units could be interpreted as possible varieties within the more generic classification of musical temporal modes as linear, circular, and branching, as they appear just as very general temporal patterns.

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<sup>471</sup> Langer, 1953, p. 118.

<sup>472</sup> MIM Laboratoire Musique Informatique de Marseille, *Les Unités Sémiotiques Temporelles: nouvelles clés pour l’écoute. Outil d’analyse musicale*, Introduction, CD-ROM, MIM (coll. INA/GRM), Marseille, 2002.

<sup>473</sup> Hanslick, 1986, Ch. III.

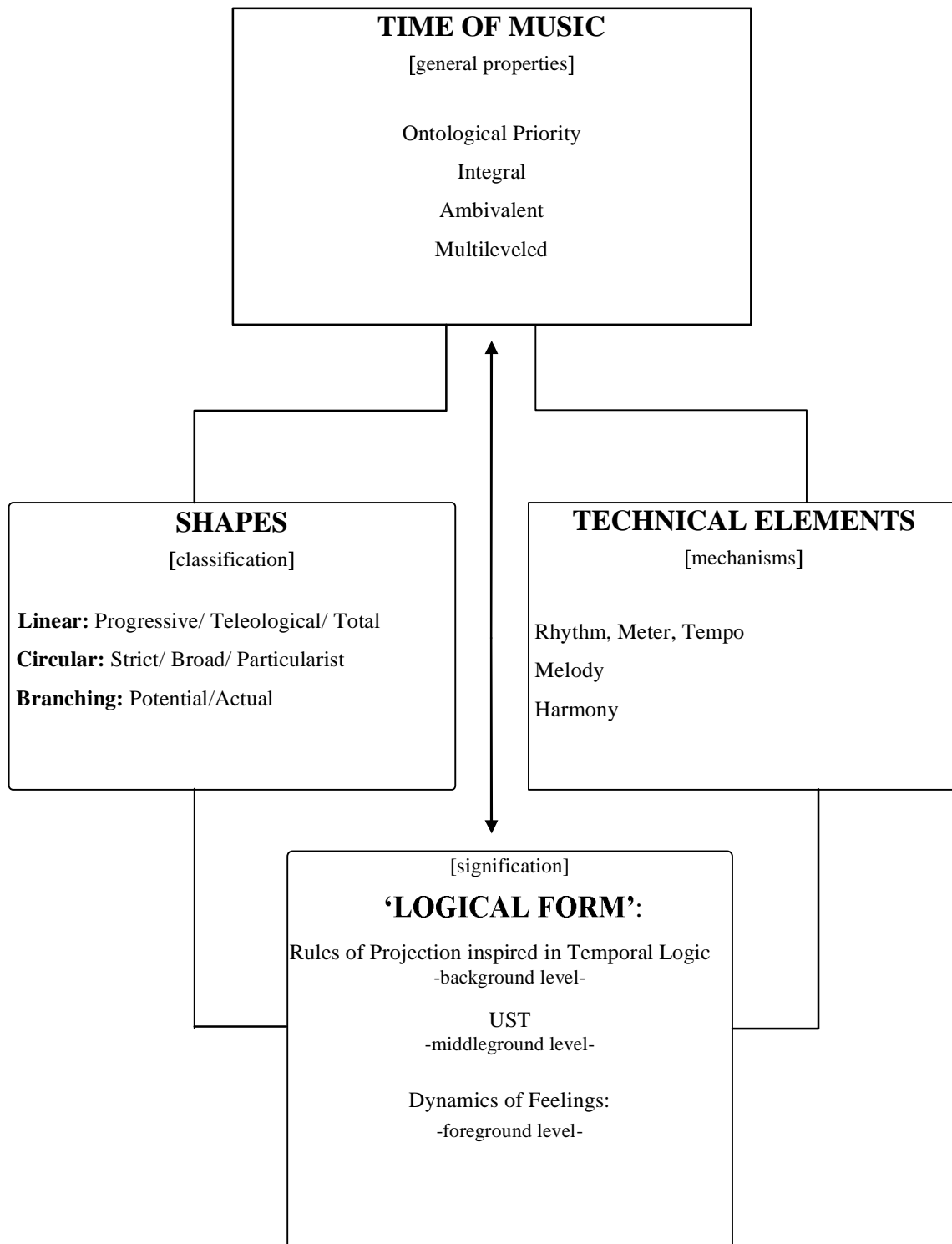


Figure 6

Adapted from: Epstein, David, *Shaping Time, Music, the Brain, and Performance*, Schirmer Books, New York, 1995, p. 11. The crucial difference between Epstein's graphic and mine is that he is referring exclusively to the strictly temporal parameters of music theory, i.e. rhythm, meter and tempo, which here appear as part of the integral whole.

A division is proposed in the following hierarchical levels. It shows the relationship between dynamics of feeling, semiotic units and ideas of time as levels of musical signification (see Figure 6):

- Dynamics of feeling (motion/rest, agitation, sudden change, etc.) in the ‘foreground’; AFFECTIVE layer.

Temporal semiotic units (‘which looks forward’, ‘obsessive’, ‘without direction because of excess of information’, etc.), as a temporal translation of the emotive dynamics in a ‘middleground’; PERCEPTIVE layer, and ultimately,

- The temporal ‘reduction’ of linear, circular, and branching inspired by temporal logic models. ‘Background’. LOGICAL or CONCEPTUAL level.

These three basic temporal modes could demonstrate music’s expression of temporal conceptions, as they were developed in philosophy of nature and existence and ultimately, suggest music’s primary signification.

This hierarchy would serve to show different levels of complexity according to if one’s focus goes searching for predominant temporal modes from minimal details of a work to larger levels, but admitting also the surface of affective and perceptive layers.<sup>474</sup>

The idea of a musical temporal logic, again, is not implying that music is logic (strictly speaking), not an application of temporal logic or formalisation of music, but a philosophico-logical reflection on the idea of musical logic as developed in musicology, which historically was thought as thematic or harmonic logic, as the logic proper for tonal absolute music. Musical temporal logic expands the description to other types of temporalities other than from the one created by tonal music (linear time) and tries to open the idea of temporal organisation to other music. Finally, it brings to the musical domain an exchange with the logical domain in the same spirit that François thinks about the fruitful commerce (but not the vassalage) of contemporary music with the logic of 20<sup>th</sup> century.

The philosophy of music interprets time as one of the most revealing levels of musical signification. Problems that belong to music understood as expressive of emotions seem solved under the prism of time studies. Philip Alperson<sup>475</sup> summarized those problems as of ‘*reconciliation*’ or what is really appreciated when listening, its association with the form instead of with certain emotional content, and of

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<sup>474</sup> Cone, Edward T., *Musical Form and Musical Performance*, 1968, p. 88, “Postlude: On Two Modes of Esthetic Perception.” Difference between ‘synoptic comprehension’ and ‘immediate apprehension’, as Cone proposes, is agreeing with this hierarchization from immediate perceivable units to larger, more comprehensive ones.

<sup>475</sup> “The Philosophy of Music: Formalism and Beyond,” in *The Blackwell Guide to Aesthetics*, 2004.

'*intelligibility*', of how a piece can be expressive of something, its 'causal' and 'representational' problems, i.e. different emotions connected to different listeners and the problem of how music itself could express specific emotions.

The problem of reconciliation is solved under the prism of time, since the temporal can be recognised more immediately as formally exhibited, or in coincidence with both the formal arrangement and certain dynamic of feelings. As for the causal problem (first antipode of the intelligibility problem), the listener unequivocally understands the music, at least at the middleground, the perceptive layer of temporality. For the representational problem, this thesis associates music with certain ideas of time; here interpretations may vary, but there is no problem in the nexus between music and time shapes, as in associating music with the emotions (that vary in much more degrees and are not ontological priority). For certain music, specific emotions (in opposition to the general dynamics of feelings) could appear but only further on be explained as iconic (imitating the gestures of our inner life) or by convention (historical associations).<sup>476</sup> For this study, however, the general dynamics of emotions are a limit, as Langer thought them.

Langer expresses in some passage that we perceive time passing because of the movements implicit in our emotional life, those intellectual, physical, emotional tensions. It can be thought as the being other way around, that we experience these emotions because there is time.

Music, as a symbolic activity on its own, does not equal language or its logic. It neither is above them in terms of any special kind of metaphysical reach, as Idealism in music supposed. Music is just a tool for the sensuous communication of time concerns, different from other tools like logic or language. This does not mean that music cannot be analysed rationally. With the aid of logical approaches it is possible to arrive at an explanation of its aesthetic commitment.

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<sup>476</sup> This solution belongs to Peter Kivy, see Alperson P., 2004, pp. 267–268.



The so-called primitive considered the abandon of land an injury against the sun, against the Inca, and against their sons.

Mistral<sup>477</sup>

To compose, in my opinion, is to create an architecture, to formulate an order and set in values certain structures, considering the totality of its components. In music, this architecture unfolds in time [...]. When time has passed, when the work has unfolded, a sense of inner perfection survives in the spirit. Only then can one say that the composer has succeeded in creating that architecture.

Ginastera<sup>478</sup>

## 5. Temporal Modes in Works of Alberto Ginastera

‘Time’ is frequently considered an elusive concept that has multiple interpretations according to different perspectives. Inside philosophy, two main corpuses grew from subjective (human time or *temporality*) and realist (abstract, natural time) ways of looking at the topic. Introductory books on philosophical time gather similar views on time related to the question of understanding, i.e. the study of its series (earlier-later and past-present-future), content, order, and scope and views arising from experience, especially in phenomenology, that understand time from a holistic point of view and as a lived, purely existential, phenomenon. The greatest philosophers spoke from either one or the other perspective about the topic: Aristotle and Kant from a realist point of view; Augustine, Bergson, Husserl, and Heidegger developed their thoughts on time from a subjective point of view.

In the musical domain, studies on musical time have also followed ontological and logical (realist) or phenomenological (also called conceptual) inquiries. Phenomenological approaches received more attention; time as experienced and what this meant in music received ample attention.

Within musicology, the technical or syntactical approach predominated over the more conceptual interpretations that appeared later under the name of musical time

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<sup>477</sup> “Este falso primitivo consideraba el abandono de la tierra un delito contra el sol, contra el Inca y contra sus hijos.” ‘Algo sobre el pueblo quechua’, *Prosa de Gabriela Mistral*, 1989.

<sup>478</sup> Ginastera, Alberto, “A la découverte d’un compositeur d’aujourd’hui”, interview by Luc Terrapon in *Musique Information, Journal of the Jeunesses Musicales de Suisse*, 1982.

studies. Studies on the temporal parameters of rhythm, meter, and tempo investigated the temporal engines of music; however, a broader conception of the time of music allowed the discovery that time was significant not only at the semiotic level of the *signifier* but also at that of the *signified*. This means, to associate music with cultural ideas of time that can be considered a clue for understanding its temporal meaning and not just its temporal structuring. Musicologists Carl Dahlhaus (1928–1989), Edward Lippman (1920–2010), Lewis Rowell (b. 1933), Raymond Monelle (1937–2010), Jonathan Kramer (1942–2004), and recently, Karol Berger (b. 1975), to mention a few, dealt with this broader view. They searched variously through the music of the Renaissance, Baroque, Classic, Romantic and Contemporary eras, focusing in the European and North American production of art music, excepting Rowell, who also extended his investigations to include non-Western music.

Ginastera's 'inner perfection' obtained after listening, is the node to be explained here. This sense of unity for musical pieces is achieved by following linear, cyclical or, branching musical time logics that have origin in homologue philosophical ideas of time:

The straight line and the circle, respectively, are the traditional geometrical representations of time. According to the linear conception time is progressive. Strictly speaking, nothing will stay as it was, everything will change. Even if a phenomenon appears to be stable, say, the whiteness of an object, it is still not seen to be identical with 'same' phenomenon one moment ago—since that phenomenon does not really exist as opposed to the phenomenon we are contemplating 'now', and which does exist. According to the circular conception of time nothing is really new. Any event is a repetition of previous events, and will be repeated indefinitely in the future. These two geometrical images of time have been dominant within the philosophy of nature and other strands of systematic thinking from the antiquity and up to this century. However, during the last decades a number of intellectuals have suggested a new kind of time model. According to these models time is viewed as a branching system—a tree-structure.<sup>479</sup>

## **5.1. Music and Linear Time**

For Westerners, the idea that time develops upon a line is such a familiar concept that everyday routine can hardly put it under discussion; it is undoubtedly the first answer one could obtain after asking how time is structured. It is at more profound levels that we allow ourselves the impression that other times are governing us.

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<sup>479</sup> Øhrstrøm, 1995, p. 180.

It was with Augustine that the defence of linearity in time was established, as one can find in the *Confessions*, X–XI and *The City of God*, XI–XII.<sup>480</sup> Augustine condensed the temporal conception of the Hebrew world, opposed to that of the Greeks. The Hebrews conceived time as temporal perceptions or pulses, which were perceived internally as duration and temporality. The Greeks, as it will be recalled in the next section on cyclical time, conceived time as based on the movements of celestial bodies, with their cyclical and repetitive way, emphasising atemporality.

Augustine's internal or *intimae* version of time is in opposition to that of time as measured by external objects. Time as thought of by Augustine is different from later contemporary interpretations of time as experienced (Husserl and Heidegger); it is deeply connected with the theological problem of eternity. Eternity is heterogeneous to infinite time in that it surpasses all times, it is transcendental to it. While eternity is synonym of plenitude for Augustine, infinitude is pure indefiniteness and present time, a mere moment, something to be snatched. The result is that in the context of his philosophy, time and eternity must be interpreted as immeasurable.

What is of interest here, from the point of view of the structure, is that the theological interpretation of time separated from antique views in that it had to mark a moment of creation as well as one of final judgement. In the context of religious thought, eternity-in-time could not be accepted. How could creation be possible? God created the world in eternity; world was created *with* time, and that is why it has an origin. Augustine also maintained the idea that no identical lapses of time could ever be possible. This means he thought about the irreversibility of time series. These aspects define linearity and work as opposite to a circular view of time.

For Christianity, history has a beginning, a development consisting of infinite possibilities from which men choose one determined path to follow in the election of their actions, and a final open eschatological end. Temporal logic could help at the moment of deciphering a certain conception of time in Augustine. In offering a clear range of ontologies of time, temporal logic facilitates discerning whether Augustine is speaking about linear or branching, finite or infinite time; a time whose individuals are considered points, intervals, or events, be it dense or discrete time.

Augustine's theory of time in *Confessions*,<sup>481</sup> begins with the question: How can we construct time from temporal moments which seem to refuse this direction? The past no longer exists, the present exists in order to disappear, and the future does not exist yet.

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<sup>480</sup> A complete critical exposition found in Licentiate thesis, *El problema del tiempo en la música*, 2003.

<sup>481</sup> *Confessions*, XI, xiii–xxviii.

Augustine's answer is: "Past and future are relative to a present, the present of the mind."<sup>482</sup> Now, in this present of the mind is where the measurement of time takes place.

He then improves the solution of the first stage according to which the measure of time is operated from the present. Duration is measured not in a present-instant, that has no extension, but in accordance with a time interval. We measure the trace that the event leaves on the immediate memory and not the present itself.

Augustine mentions here the case of the first verse of a hymn comprising short and long syllables. To measure at all, one has to enlarge the past in conformity with the advance of the singing and reduce the future.<sup>483</sup> He finally arrives to his overall concept of time: "Time is a distension of the mind."<sup>484</sup> And he gives precisely the example of a liturgical hymn.<sup>485</sup>

Augustine adds an extra reflection, that the future is fully written and that the experience of time consists in foreseeing it and in picking up the progress towards the past. However, predestination, which recalls the stoic fate according to which, the whole history is fixed and repeats from cycle to cycle, is in opposition to the Christian conception of time. The biblical God is not successively present in the universal movement of time, even when he knows everything in eternity.

This view of time could be connected also with the internal time of the interpreter over the notated, measured time provided by the score, i.e. the internal time that provokes those known fluctuations between performances. And specific to music theory, it can even be connected with rhythm, the 'flesh' over the metrical parameter, as well as with expressive resources such as *rubato*.

Considering methodological approaches for inquiring into musical time, phenomenological musical time is concerned with this *distension* in respect to our musical perception. Husserl's 'retension' (the perception of past time in the present) and 'protension'<sup>486</sup> (the inclusion of future into the present) deepens the Augustinian vision of time.

Secondly, having defined the other method of investigating musical time, the ontological, 'in-time logics' could be equated with Augustine's thoughts when investigating musical time. This is in the sense that they will try to place attention on

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<sup>482</sup> Ibid., xx.

<sup>483</sup> Ibid., xxvii.

<sup>484</sup> Ibid., xxviii.

<sup>485</sup> Id.

<sup>486</sup> *The Phenomenology of Internal Time-Consciousness*, 1928, Sec. 2.

formalising time as inhabited by the user of that time, the time as it is internally perceived.

Karol Berger<sup>487</sup> recalls Augustinian thoughts on time but supports an apparently opposite interpretation from the one presented here. He contextualises Augustine's philosophy as having impact on early music up to the appearance of the, precisely, linear time-inspired music which came later on. The present thesis, which departs from Augustine as the onset of a linear conception of time, although recognising the importance of the basal idea of Christian eternity in his thoughts, considers his philosophy as the departure for the configuration of an image of time that straightened the *circle* of the antique philosophers into an *arrow* that would reach its historical climax in modernity, around late 17<sup>th</sup> century.

A concept that also deserves attention when speaking about linear time and music is clock time. Raymond Monelle, in his essay on musical temporality, described its cultural repercussion: "Clock time came to birth when the naturally encompassable cyclic times were overridden for purposes of profit."<sup>488</sup>

A basal constructivist (mathematical) definition for a clock is illustrative here:<sup>489</sup> For a clock to be possible you must have three conditions solved: 1) The existence of a pulse generator. 2) Given a class of pulse generators, whenever I put two generators, they must remain isochronous. 3) The isochrony must be kept for any possible phase delay. When these three conditions are obtained, we say that we have a clock. However, for the constructivist, this is impossible to verify in experience because one cannot consume an infinite time. In consequence, one only knows what a clock is for the sole reason of having the rules for its construction.

Aristotle's idea of time is sometimes compared to clock time. Although the shape or structure of time as conceived by Aristotle is going to be treated in the next section of this chapter, i.e. circular time, I will address here some ideas about his conception of an external time. Aristotle's time is called objective in the sense that it is measured by an external generator (in opposition to an internal one, as it was for Augustine). For him, it is the movement of heavenly bodies and the First Unmoved Mover that works as a pattern for the rest of the movements.<sup>490</sup> The circular movement of the sky is to be reproduced by the clock, for it to generate a pattern of measuring, through which identical times could be compared.

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<sup>487</sup> Berger, 2007, p. 165–67.

<sup>488</sup> Monelle, 2000, p. 93.

<sup>489</sup> Janich, Peter, *Protophysics of Time: Constructive Foundation and History of Time Measurement*, 1985, p. 152. Also Lorenzen, Paul, *Constructive Philosophy*, 1987, pp. 195–197.

<sup>490</sup> *Metaphysics*, XII.

In contemporary views stemming from interdisciplinary research on time, Fraser defined clock time as “any machine or process which exhibits change according to unchanging laws. Clocks are, therefore, simplified images of our views of change and permanence.”<sup>491</sup> According to Fraser, there are various (“a parade of”) clock times: cosmological, astronomical, gravitational, atomic clocks, thermo dynamical, biological, and psychological. Also there are time-scaled clocks, “a comparison of long-term operation of various clocks.” This means, ‘astronomical’, ‘biological’, ‘psychological’, and ‘atomic vs. gravitational’ time scales.

Edward Hall, when tracing a European anthropology, describes Europeans as monochronic, “convinced that its cognition of clock time is all there is to know about time”.<sup>492</sup> Jacques Le Goff investigated the cultural change when clock time was incorporated alongside lived and sacred times, i.e., the passing from sacred time to secular time in the Renaissance. Mechanical clock was put in use around 1380–1450. Given this situation:

[I]n a condition of complex wholeness, the west changed at the time of the Renaissance to a place where temporal wholeness had to be struggled for, a place where culture divorced people from time, and semiosis had to participate in the effort to regain a sense of duration.<sup>493</sup>

According to Monelle, based on George Poulet, culture was once polychronic but switched from a harmonic state between the various species of time to a later dramatic outcome.

[In medieval time] the different times, times of creation, succession, action, history, were folded into one another and sustained each other. Because the medieval experience was chiefly a feeling of permanence, people did not feel any discontinuity between their existence within the changes of history and their being in the present moment.<sup>494</sup>

As stated, this polychronic, harmonic state collapsed in the Renaissance:

Instead of permanence underlying the changes of life and history, people saw nothing but change and vicissitude; God was no longer the external force who preserved his creatures in their own continuing temporalities, but an inner force which helped them combat the unpredictable shifts of life.<sup>495</sup>

From 1550, the search for a music reflecting an ‘ethos’ and opposed to the idea of a music understood as harmony began to flourish again. Karol Berger notes this moment

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<sup>491</sup> Fraser, “Introduction to the Study of Time”, 2008, p. 63.

<sup>492</sup> See Monelle, 2000, p. 93. Hall, Edward, *The Silent Language*, 1959.

<sup>493</sup> Monelle, 2000, p. 94.

<sup>494</sup> Id.

<sup>495</sup> Ibid., p. 95.

in the 'Prelude' to his book, where he sees Monteverdi's *L'Orfeo* (1607) as a figuration of the dispute between the antique (chromatic, mimetic) music and the modern (diatonic, harmonic) one.<sup>496</sup> From the Renaissance itself to the eighteenth century there were changes too. The eighteenth century discovered that in the midst of mere change and vicissitude there was *memory*. According to Poulet: "To exist, then, is to be one's present, and also to be one's past and one's recollections."<sup>497</sup> How all this affected the music is connected with the birth of sonata form and the will of narrating through music mentioned below.

Monelle, in turn, enlightens an aspect connected to clock time, that is, its association with musical meter. "Musical meter, it need hardly be said, has nothing to do with the clock, but more to do with the body."<sup>498</sup> Moreover, "dancing and marching are, in spite of obvious appearances, nonprogressive".<sup>499</sup>

Clock time, since Aristotle's thought of time as an external objective 'number' of movement in *Physics*, could be associated with the musical metrical patterns and resources such as the *tempo giusto*. Monelle remarks, regarding this kind of associations, that there is more than the aspect of the *signifier* (the level of the sign): there is the *signified* (the interpretation of this sign and its context). Thus, the association clock-time/meter is merely abstract and dissociated from a contextualised perspective. A more significant way of looking at clock time in music is Monelle's interpretation of clock time as the time which suggests that music wanted urgently to recover for itself the 'lost time', i.e. the lived one, through what he calls 'lyric time', meaning the indivisible time of the melody.

Clock time is, historically and according to Monelle, connected to the idea of progress. He opposes the linearity associated with this clock time to the continuity of lived time, which cannot be fragmented. Lived time is the basis for his 'lyric time'; clock time is the basis for his 'progressive time'. In relation to the time of dance, it is uniform, homogeneous, easily confused with clock time, but in contrast to clock time the time of dance is cyclical, non-progressive. Clock time, on the contrary, is associated with progress and history.

The theories growing in physics about the origin and fate of the universe, as well as the discussion on the arrow of time, came later to propel this linear view. This view was

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<sup>496</sup> Berger, 2007, pp. 19–42.

<sup>497</sup> Poulet, George, *Studies in Human Time*, 1956, p. 24.

<sup>498</sup> *Ibid.*, p. 94.

<sup>499</sup> *Ibid.*, p. 91.

supported earlier by a theological credo and reinforced by the creation of the clock. A theological view would in principle accommodate with physics *if* one interprets the origin and fate of the universe according to the standard big bang and big crunch theories of the universe. In addition, it would coincide with the seemingly successive, irreversible order of the moments of time. A slightly modified theory was however the one mentioned by Stephen Hawking in his famous book of 1981, where he doubted that things were so tidy: “[S]pace-time was finite but had no boundary, which means that it had no beginning, no moment of creation.”<sup>500</sup>

Friedmann’s model, attacked by Hawking, is known as the ‘hot big bang model’. It defends the idea that the expansion of the universe is in proportion to a parallel cooling state.

At very high temperatures, particles would be moving around so fast that they could escape any attraction toward each other due to nuclear or electromagnetic forces, but as they cooled off one would expect particles that attract each other to start to clump together.<sup>501</sup>

The theory explains that there is then a ‘zero size’ of the universe, which has been insuperably hot. According to Hawking, this theory was formulated by scientists George Gamow and Ralph Alpher in 1948. This work included a prediction about radiation, as an effect of those hot stages. The direction of the expansion, it was believed, was at the same time the cause of the subsequent re-collapse:

The universe as a whole would have continued expanding and cooling, but in regions that were slightly denser than average, the expansion would have been slowed down by extra gravitational attraction. This would eventually stop expansion in some regions and cause them to start to recollapse.<sup>502</sup>

The theory explained how both rotating and elliptical galaxies were born. With time, gradual changes in the atmosphere allowed for the variety of life we find nowadays. These ideas are found amenable to be interpreted alongside with the biologic theory of evolution, Darwinism, since according to this theory, previous errors (i.e. replication and hazard) occur until determined forms of life came to surface (adaptation).<sup>503</sup>

The scientific hypothesis summarised here was not convincing for Hawking. The reason for his scepticism was firstly, the question about *why* the universe was so hot at the beginning. In addition, it is not clear why the universe is so uniform that temperature is the same all around even nowadays. There must be a reason why the universe started

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<sup>500</sup> Hawking, Stephen W., *A Brief History of Time, From the Big Bang to Black Holes*, 1988, p. 116.

<sup>501</sup> Id.

<sup>502</sup> Ibid., p. 119.

<sup>503</sup> Ibid., p. 120–121.



at the same temperature at every distant region. Furthermore, why the universe expanded at this critical rate that makes possible re-collapse and its parallel expanding capacity, the same which continues until today, is an extra difficult obstacle for believing that the available theories are convincing. Hawking's prediction is: if one considered a minimum modification of this rate of expansion, the universe would have already re-collapsed before reaching the present form. Finally, why would such irregularities or 'density fluctuations' as stars and galaxies exist in a uniform and homogeneous universe?

While not a distant extrapolation, the relevance for music of presenting physical hypotheses and their testing out along the recent years seems apparently non-existent. However, the philosophical concerns about the structure and way in which time is perceived by human minds is directly linked to music practice both in its syntactic organisation as well as in further semantic and pragmatical sides of it. It is the main point of this thesis to reconnect these levels of reality, which seemingly do not have any connection; however affinities reach the surface when examined more closely paying deeper attention.

Works of music contemporary to the above mentioned discussions in physics, such as those by Morton Feldman (1926–1987), present infinite density as an idea of time behind them, which was foreign to previous music eras.<sup>504</sup> However the old ideas of beginning and fate of the universe (and of time) as well as of the direction of time, were crucial in the development of most of the repertory of classical art music that we consume. Temporal ideas permeate music production in several ways as it will be shown specifically in the section below on musical analyses.

According to Hawking's critiques to the standard big bang theory, "[s]pace-time *would* have a boundary—a beginning at the big bang."<sup>505</sup> This means that no theory can be certain about the beginning or creation of the universe since no effects provide an explanation of the exact conditions for its apparition. What we know is what we can see, but they are not the reasons for the world becoming as it is.

The whole history of science has been the gradual realisation that events do not happen in an arbitrary manner, but that they reflect a certain underlying order, which may or may not be divinely inspired. It would be only natural to suppose that this order should apply not only to the laws, but also to the conditions at the boundary of space-time that specify the initial state of the universe.<sup>506</sup>

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<sup>504</sup> Dixon, 2002, p. 512.

<sup>505</sup> Hawking, 1988, p. 122.

<sup>506</sup> *Ibid.*, pp. 122–123.

From now on, connected development on theories of randomness as a hypothesis for explaining the beginning of the universe connects with the later treatment of branching time and music.

Physical theories, dealing with the problem of the origin and fate of the universe, considered the problem of the *scope* of time. These theories also explain the arrow of time, which touches the logical problem of the *order* of time (whether finite, infinite, or unbounded).

The consequence that ideas on time—such as the passing from the idea of the absolute time to that of the relative time at the beginning of the 20<sup>th</sup> century—have had in the production of the post War music could in principle illustrate Witold Lutoslawski's aesthetic decision of superposing at random different instrumental parts in his String Quartet (1964), instead of presenting them in a synchronous manner as had been traditionally done. All this does not mean that we are certain of an actual connection between any idea of time and certain music, or that they were made explicit by the composers, but there is evidence and justifications that a theoretical linking would not be arbitrary.

The following idea that feeds the argument of linearity is the conception of the arrow of time. It is linked with what physics calls an increase of entropy or disorder. There are thermodynamic (“direction of time in which disorder or entropy increases”), psychological (“the direction in which we feel time passes, the direction in which we remember the past but not the future”), and cosmological arrows of time (“the direction of time in which the universe is expanding rather than contracting”).<sup>507</sup>

For musical repercussions it is interesting to associate this image of time as an arrow from the point of view of the methodological decisions that it promoted. The ontological interpretation of time in music, as Rowell described in Kramer's book review,<sup>508</sup> is fond of this vision of time as an arrow. This thesis concentrates in the defence of a metaphorical time on top of it. It is for this reason that Marsden's treatment, about a comprehensive view of the time of music, at moments fails to convince. Music ultimately pinpoints something other than its physical arrangement, and traces different temporal meanings upon the literal arrangement of the arrow.

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<sup>507</sup> Ibid., p. 145.

<sup>508</sup> Rowell, 1990. 1.2. of this thesis.

Evans-Pritchard's study of the Nuer, Nilotic people of Sudan, an anthropological theory investigating time conception in preliterate societies divides the study into two temporalities:

In describing Nuer concepts of time we may distinguish between those that are mainly reflections of their relations to environment, which we call oecological time, and those that are reflections of their relations to one another in the social structure, which we call structural time.<sup>509</sup>

As Monelle clearly explains, these times are conceived from the basis of the "movements and activities of the tribe" and based either on climatic or seasonal conditions, or rather in social life and its crucial moments. The structural time Evans-Pritchard mentions is the historical time as opposed to the repetitive, oecological time. It is a time whose events are unrepeatable and irreversible, contrary to the other cyclical time of the seasons which is repeatable and reversible. Monelle adds still that "western temporalities differ somewhat from those of non-literate peoples".<sup>510</sup>

The bichronic exposition of temporality in Westerners by Monelle and others should be revisited and expanded. But an actual *trichronic* vision from the West should be examined first. This consideration however, will appear clearer at the end of the chapter. Bichronicity is extended to trichronicity here in a sense which is inspired by philosophical and literary sources.

In aesthetic studies, since the beginning of a theory of arts with Aristotle, the idea of a linear arrangement of a plot was predominant. The idea of forms with a tripartite configuration (introduction—development—conclusion) is already found in Aristotle. In *Poetics*, Aristotle defines the form that plots or fables must have:

We have laid it down that a tragedy is an imitation of an action that is complete in itself, as a whole of some magnitude; for a whole may be of no magnitude to speak of. Now a whole is that which has beginning, middle, and end. A beginning is that which is not itself necessarily after anything else, and which has naturally something else after it; an end is that which is naturally after something itself, either as its necessary or usual consequent, and with nothing else after it; and a middle, that which is by nature after one thing and has also another after it. A well-constructed plot, therefore, cannot either begin or end at any point one likes; beginning and end in it must be of the forms just described.<sup>511</sup>

This classical idea of completion is going to be decisive for the way music is also structured and specially, for the history of the classical musical forms. Linearity is

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<sup>509</sup> Evans-Pritchard, E. E., 1940, p. 94.

<sup>510</sup> Ibid., p. 85.

<sup>511</sup> 1.450b, VII.

regularly accompanied by a strong sense of opening and closure; meanwhile the cyclic elaborates the beginning and the closing by giving a sense of smooth apparition and dissolution, without any exact onset and explicit final gesture. That is why the emphasis on time beginning and ending is associated with a linear conception of time.

In music, there are specific devices expressing a linear conception. These are for example gestures of beginning. Rowell<sup>512</sup> analysed those gestures in an article finding thirteen different types in Beethoven's music: 'plosive', 'emergent', 'plexive', 'detached', 'diacritic', 'metrical', 'entrained', and 'sustained', are considered by the author tactical beginnings. Strategic beginnings are, on the other hand, 'seminal', 'framing', 'emblematic', 'evolutionary', and 'ironic'.

Something about extension should also be mentioned, which has to do with other aspects of musical temporality. Aristotle writes that the extension of a work cannot be endless, unless the plot requires it, but the larger the work, the more beautiful and harmonic it will be.<sup>513</sup> Inversely, it cannot be tiny, because it would lack of development or extension for presenting the argument.<sup>514</sup>

In musical semiotics, specifically in semantic approaches, music is considered to display a narrative form, a similar structure as in literature, a story-telling. In this line, Eero Tarasti has been studying how music inherited the structure of myths.<sup>515</sup> Actions and actors are described in this context. The music of the first Viennese school has been associated with plot-centeredness. The theory of *topoi* appearing in Ratner's *Classic Music*,<sup>516</sup> demonstrates this.

Regarding the study of temporality, Monelle explains there was a sense of permanence changing to an idea of progressive time in music that paralleled the shift in human's temporal experience. This incipient linearity, is not primarily defined by its being initial-medium-conclusive in the sense of consequence in the internal form but by the simple sense of forward process implicit within the work.

The historical perspective, highly important for tracing the moment when changes from a temporal model to another was effectuated, is however going to be considered a

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<sup>512</sup> Rowell, 1998, p. 30.

<sup>513</sup> Aristotle, *Poetics*, 1.451<sup>a</sup>.

<sup>514</sup> Contemporary pieces on the contrary try to pass these stylistic limits, and there are works of Erik Satie (*Vexations*, 1893) and Morton Feldman (String Quartet II, 1983) above-mentioned, that match with the no-boundary conditions for the universe in physical theories.

<sup>515</sup> *Myth and Music, a Semiotic Approach to the Aesthetics of Myth in Music, especially that of Wagner, Sibelius and Stravinsky*, Paris, Mouton, 1979.

<sup>516</sup> *Classic Music: expression, form and style*, 1980, pp. 9–30.

sideline. The point is describing temporalities working together in a same period, but functioning in a *cumulative* way, i.e. altogether, since they are not anymore exclusive of an historical period in music.

Music before 1750 was probably not at all proposing a progressive time (or only in a timid manner). Music after 1750's did not probably reflect convincingly (or do it just by chance) multiple times. This happened later, at around the 1950s, when philosophical, physical, logical, and literary views began to incorporate the idea of branching. However, how can we explain cyclical ideas of time after 1750, or linear ideas of time after 1950? There are philosophical reasons, which independent of their historical onset still deserve to be analysed. It can be called a philosophical primacy, for later delving into concrete historical analyses.

A similar point is found when Rowell, explaining that changes in temporal modes are not exclusive of 20<sup>th</sup> century music, detects examples of multiple times in Mozart's *Don Giovanni* (end of Act I), and circular times in the Prelude to Wagner's *Parsifal*.<sup>517</sup> The work of Stravinsky appears amenable to this cumulative way of understanding temporalities in music.<sup>518</sup> This last consideration suggests that even diverse temporal decisions can be traced through the production of a single author.

Karol Berger comments on the transition that took place around 1750, from an idea of cyclical time to the time conceived in the form of an arrow, and consequently, how this had an impact on the music of the epoch. Berger situates the birth of Modernity not in the Renaissance but in the later time of the Industrial Revolution, with its idea of progress. He judges this moment to be more decisive, permeating music with an analogue sense of time. In turn, according to Berger, modern music should be situated in the same period in the history of music, contrary to the common restricted vision of musical modernity as twentieth-century modernism.<sup>519</sup>

Berger agrees with E.T.A. Hoffman (1776–1822); the latter had attached his sense of 'modernity' to Mozart, Haydn, and Beethoven's music: "What was decisive for him was not the renovation of compositional means but the new aims that these means were expected to serve."<sup>520</sup> What defines new music is its separation from language and hence from the mimesis of anything definite, anything in particular. New music's "only

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<sup>517</sup> Rowell, 1983, p. 247 and note 72.

<sup>518</sup> Kramer, 1988, pp. 221–285.

<sup>519</sup> Berger, 2007, p. 5.

<sup>520</sup> *Ibid.*, p. 7.

subject-matter”, Hoffmann famously declared, “is infinity.” All of earlier music’s “precise feelings” are abandoned in favor of “an inexpressible longing.”<sup>521</sup>

In the following paragraphs of his book, Berger develops his own proposal in relation to Hoffman’s concept of musical modernity:

Although I think that Hoffmann put his finger on a centrally important point here, I shall not make this the focus of my investigation. Instead I would like to concentrate on a *change in the shape of musical time*, on the demotion of what might be called, now with a nod to Stephen Jay Gould, “time’s cycle” in favor of “time’s arrow”.<sup>522</sup>

The assumption which is relevant for the present thesis is, simply, that in music of the period he describes, i.e. from 1750 onwards, the temporal order in which events occur always matters.

The disposition of events in a sonata (or string quartet, symphony, concerto), the temporal order in which they appear, is essential: to tamper with it is to drastically change, or destroy, the meaning of the work. The temporal positions of the main and second subjects, or of exposition and recapitulation, cannot be swapped at will. To experience such works with understanding one has to register, however dimly, that the material being developed has earlier been exposed, or that what is now being recapitulated has already, in some form, been heard before. The interpolation of the scherzo material in the Finale of the Fifth Symphony does not make much sense unless one is aware of its having appeared earlier.

This much is obvious. What is less obvious is that not all music works this way [...]. [...F]or music written a mere half century before the Viennese classics this assumption of the primacy of the temporal disposition of events is invalid.<sup>523</sup>

Here Berger refers to a very common understanding of linearity in music, which also appeared in Kramer’s book on musical time, as ‘teleological’. Berger, in contrast to Kramer, emphasises this temporal election in connection with a broader cultural movement. He differs as well from Monelle’s particular understanding of linearity, who speaks in terms not of plot sequence but of a more basic idea of progression or movement forward of the music.

Berger focuses on intellectual images of the epoch, figures such as Don Giovanni (“a modern man aspiring freedom through desire”) or Faust (“a man aspiring to be free through his will to power”).<sup>524</sup> In this way, linear time appears in the sense of a time of human autonomy discovered by the period, disengaged from eternity, characteristic of the previous era. How this already changes with Beethoven, and how the heroic men

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<sup>521</sup> Ibid., p. 6.

<sup>522</sup> Ibid., p. 7. Italics by the author.

<sup>523</sup> Ibid., pp. 7–8.

<sup>524</sup> Ibid., p. 9.

portrayed in his works become ‘nostalgic’ and come back to represent circularity, permanent images of time in music as a way of escaping from this world, is also a post-topic addressed by Berger.

The Beethovenian abstraction out of time is the obverse of the Beethovenian heroic quest and its temporal teleology. Music had no sooner acquired its “classical” ability to represent linear time than it began “romantically” to undermine and question it by exploring moments of timelessness.<sup>525</sup>

The works used by Berger to illustrate his main argument are Bach’s *St Matthew’s Passion*’s first chorus and first fugue of the *Well-Tempered Keyboard*, and Mozart’s *Don Giovanni* and *The Magic Flute*. When listening to the former, he thinks, there is no need to keep track of the moment where we are in the piece in order to understand it. It is not possible to signal a certain moment as the end, in fact, many *ritornelli* can appear in Bach’s music until one reaches the final one. Moreover, this happens equally in a fugue or in a concerto, it is not a question of genre. But this works differently with the classical style. We assume there is certain order, we expect certain things and we are quite sure about the moment when the piece reaches the end.

Berger’s proposal then associates the reasons for the shift in musical temporality with a change in ideas about time:

[T]hat in the later eighteenth century European art music began to take seriously the flow of time from past to future. Until then music was simply “in time”; it “took time”—events had somehow to be arranged successively, but the distinction between past and future, “earlier” and “later,” mattered little to the way the music was experienced and understood. From that point on music added the experience of linear time, of time’s arrow, to its essential subject matter. Music could no longer be experienced with understanding unless one recognized the temporal ordering of events.<sup>526</sup>

The shift in the perception of time does not necessarily have to be understood as a straightforward, causal thesis for the shift in musical perception:

Rather than worrying about the causes of the change, I simply register the structural homology between the shapes of the historical and musical times, and note its consequences [...]. New musical means [...] are adopted to realise new aims. But whether these new musical means were specifically developed to realise the new aims or whether evolving independently of these aims—which seems more likely—they later adapted to them remains an open question.<sup>527</sup>

In the same vein, Raymond Monelle suggests that one should not put music and time ideas in association straight away, unless taking a critical position:

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<sup>525</sup> Ibid., p 17.

<sup>526</sup> Ibid., p. 9.

<sup>527</sup> Id.

It would, perhaps, be wrong to look in music for the cultural and social temporalities described by Poulet or any other writer. Attempts to transfer anthropological and philosophical accounts to music have generally led to confusion and special pleading.<sup>528</sup>

However, Monelle also admits a connection, although not a straightforward one. His writing as a whole adheres to the association of a time-in-general and the time of music, which is confirmed by these passages:

[T]he “dominant” temporality of the “monochronic” west is not something we can look for in western music. Far from reflecting clock time, music, through its complicity in cultural semiosis, is devoted to recovering western man from the abyss of clock time.<sup>529</sup>

Apparently, the detachment of the mind from its thoughts, the alienation of experience from cerebration, led to a progressivizing of lyric time as musicians felt a need to place lyric unities in a context of discourse.<sup>530</sup>

Monelle follows a similar thesis then, but supports it in a slightly different way than Berger. The pairs of oppositions with which he works to reach his main argument are ‘cyclical’ vs. ‘historical’ time in Anthropology and ‘clock time’ vs. ‘*duration*’ in the West, to finally arrive at the distinction of a ‘lyric’ vs. ‘progressive’ time in music. This last one is his main distinction for placing the change effectuated within the musical domain at about the same historical period as Berger, the second half of the eighteenth century.

The first distinction of clock vs. duration time elaborated by Monelle, involves logically speaking about a problem of *texture*, i.e. of discontinuous vs. continuous time. This distinction is superimposed to the original search about the *shape* of time (i.e. linear progressive vs. cyclical ‘lyrical’). Like Berger, Monelle traces the social history around this. He describes the change from a medieval to a modern experience of time, placing the music of Bach in this context as well, and the birth of the sonata form.<sup>531</sup>

In his reflection about music as linked to time ideas, Berger quotes an important passage from Hegel’s *Aesthetics*, where the philosopher expresses the ‘supreme’ function of art, as embodying philosophical and religious ideas, although via its proper medium, which are the senses. Berger concludes from Hegel: “[Likewise, m]odern

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<sup>528</sup> Monelle, 2000, p. 98.

<sup>529</sup> Ibid., p. 94.

<sup>530</sup> Ibid., p. 98.

<sup>531</sup> It is curious that Berger does not mention this previous study, neither another important article, also by Monelle, on Bach’s temporality: “Real and Virtual time in Bach’s keyboard suites,” 1998.



music's newfound ability to embody the experience of linear time made it suitable vehicle for bringing to contemporary minds some of their deepest interests."<sup>532</sup>

This passage from Hegel is significant. However one could continue in this context to defend an even stronger argument than that of art merely reflecting ideas: that of the cognitive importance of music.

Temporal conceptions are still charged of individual, social, and even political meaning: "Definitive of modernity are narratives of secular universal history, whether conceived in liberal terms of progressive continuity or in egalitarian terms of revolutionary breakthrough."<sup>533</sup>

The case that will illustrate at this point our analysis of linear time belongs to the Latin American national modernism.<sup>534</sup> The narrative proposed in Ginastera's work deals with topics of colonization, mixtures, hybridization, transculturality, and multiple identities. In this context, goals are interpreted as arrivals to a sense of emancipation and fraternity. In this case, linearity will have a unique arrangement, but what underlies this work will still be linear time.

Mozart's *The Magic Flute* reveals a progress from darkness (minor) to clarity (major) as allegoric of the recent events of 1790 in France.<sup>535</sup> Ginastera's sonata for piano traces a path from indigenous to creoles, as a result of the mixture of races that took place in the colonisation, finally noting the acquisition of a national character, the obstinacy and bravery of the gauchos. In different contexts and with different aims, both works represent a similar time.

Traces of linearity are not rare before 1750, although they are not established:

[...M]y choice in no way implies that Bach was unaware of the possibilities of projecting linear temporal developments in his music or that he was uninterested in exploring such possibilities—or even, more generally, that he was not aware of up-to-date trends in the music of his time or eager to exploit them.<sup>536</sup>

For example, Richard Taruskin's analysis of Bach's Organ Toccata in F (BWV 540, 1708–1717), reveals a cadential preparation detached from its resolution. Taruskin associates this forward propulsion effect in music as having a psychological import.

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<sup>532</sup> Berger, 2007, p.7.

<sup>533</sup> Id.

<sup>534</sup> This modernism is characteristic of the first half of the 20<sup>th</sup> century in Latin America and has dialogue with nationalist searches. It has links with the European modernism.

<sup>535</sup> Berger, 2007, p.16.

<sup>536</sup> Ibid., p 10.

This means, emotional and dramatic capacities in music had already found a place to be amply expressed.

Thanks to this newly psychologized deployment of harmonic functions—in which harmonic goals are at once identified and postponed, and in which harmonic goals are at once directed and delayed—“abstract” musical structures could achieve both vaster dimensions and a vastly more compelling emotional force than any previously envisioned.<sup>537</sup>

Berger gives an account of how the exploitation of the circle of fifths influenced the Italian instrumental ensemble music for creating this sense of forward propulsion in music. According to Taruskin, Arcangelo Corelli (1653–1713) was the responsible for theorising the harmonic motion and used it in practice for the first time. However, Berger thinks that having had this resource's possible origins in the Rome of 1680s, it was however fully developed in the Vienna of 1780s.<sup>538</sup>

The idea, in essence, consisted in relating all the scale degrees within a key, as well as all the keys within a movement, to a single tonal center, and measuring the distance of a degree or key from the center by chains of fifths. [...] Whether on the local level of a single phrase, or on the global level of the whole movement, the establishment of a tonal center, the deviation from it, and the resulting drive to regain it, gave their music unprecedented forward propulsion and goal-directed momentum.<sup>539</sup>

These data, of a music with the above mentioned characteristics, are established and studied enough. What is not obvious for the perspective of this thesis, as it was mentioned also by Berger, is why this is so. The philosophico-logical grounds for these preferences about time order serves to make an explicit explanation of what is usually implicit or tacit.

Bach's music is interpreted by Berger as a hybrid which is not fully cyclical, as it could be the case with the music of Johannes Ockeghem (1410–1497). This is because his idea of time was supported by the Augustinian idea of theological eternity.

Like his church, he was fully aware of the linear unfolding of human biographical and historical time, and, also like his church, he believed this time to be enveloped by God's eternity, subordinated to it, made relative by its absoluteness. In a number of central instances, I shall argue here, his music displays a double temporality, developing unquestionably up-to-date goal-directed momentum but relativizing and subordinating its forward propulsion to a sense of cyclical or entirely timeless stasis worthy of his medieval predecessors.<sup>540</sup>

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<sup>537</sup> Taruskin, Richard, *The Oxford History of Western Music*, 2005, Vol. 2, pp. 212, 213, and 216.

<sup>538</sup> Berger, 2007, p. 11.

<sup>539</sup> Id.

<sup>540</sup> Berger, 2007, p. 12.

A similar map could be traced in philosophy, as Berger did for music from Corelli to Mozart. It is not until the secular idea of directionality of time in Kant,<sup>541</sup> supported in the classical Newtonian physics, that linear music had its parallel in the philosophical sphere.

Continuing Berger's arguments, Monelle's study based his thesis on Georges Poulet's ideas on polychronic cultures. Poulet described that medieval men lived with no disruption between being and continuing to be. Duration was included in eternity. A change was effectuated in the 16<sup>th</sup> and 17<sup>th</sup> centuries, when actions and thoughts 'disconnected' from the eternal substratum of divine time were given more weight. In the 18<sup>th</sup> century, this situation appeared described as a mere succession of feelings and sensations. The bichrony in this moment is found between secular intensified present and past memories.

As Monelle describes in relation to the 18<sup>th</sup> century, referring to Étienne Bonnot de Condillac (1715–1780):

Condillacian being is not only a succession of instants of consciousness; it is a consciousness whose interior progress constitutes a life and a history. Each new moment of awareness reveals two distinct features: not only the new sensation which is the kernel of the moment, but also the ensemble of sensations already lived, whose resonances prolong themselves within it and surround it with their nebula.<sup>542</sup>

The ideas of Berger and Taruskin about Corelli and Bach as major figures in the transition from non-progressive to progressive music is also found in Monelle with reference to the study of Noske. Noske dedicated his analysis instead to the music of Jan Pieterzsoon Sweelinck (1562–1621).<sup>543</sup>

Carl Dahlhaus in turn defends the idea that music's temporality emerges with particular emphasis in Beethoven's symphonic style.<sup>544</sup> This has the consequence of highlighting a later point of inflection for linearity in Classical music than the former authors. Time becomes approachable through music as a process, and the process character, which in Beethoven's symphonies reaches an emphatic, extreme degree, manifests itself in the development of a theme or a thematic contrast.<sup>545</sup>

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<sup>541</sup> Kant, *Critique of Pure Reason*, I, 1<sup>st</sup> Part, 2nd sec. § 5, 6, 7 and 8.

<sup>542</sup> See Monelle, 2000, p. 96.

<sup>543</sup> Id.

<sup>544</sup> "Beethoven's Symphonic Style and Temporality in Music," in *Essays on the Philosophy of Music*, 1988, p. 285.

<sup>545</sup> *Ibid.*, p. 282.

Dahlhaus clarifies, linearity by thematic processes is not defined as any ‘unfolding’ but rather, these thematic processes are seized by the teleological pull imposed by the form. Development or unfolding of a theme takes place whenever something is implicated, as in Schubertian sonata, whereby a theme is seen from various angles; or in Beethoven’s style, where is defined instead by ‘dramatic’, circular movement rather than ‘exegetical’ goal-directed: “If the goal-directed process leaves the past behind, this being ‘sublated’ in the present, then the circular motion around the theme resembles a memory in which the past impinges on the present.”<sup>546</sup>

Regarding logical descriptions of linearity, the logic of time served from the beginning to elucidate temporal issues in metaphysics but immediately proved useful in the field of computing. “There is already a substantial body of work on time within the logic community, motivated in part by artificial intelligence (reasoning about sequences of actions), computer programming, and hardware design.”<sup>547</sup> Particularly, this thesis does not focus on artificial intelligence-linked developments but on its former philosophico-logical aspects.

Logic remains useful in providing musicologists and musicians with a theoretical tool whenever time is a perspective they want to investigate in their respective analyses or when they want to master it in their creative work as composers. The question of reasoning or calculus as logic’s main interest is however rethought by the present research on musical time. Although it could find application in the evaluation of systems of representation for computers, as it was presented here in relation to Marsden’s work, from an aesthetic point of view it appears restricted and impoverished. Temporal logic then is assumed as it brings the outlines of structures, which are going to be interpreted not as an abstract or realist conception of time in music but in its musical presentations and within its musical intentions.

Marsden associates linear logic to point and to period temporal logic respectively because his main goal is to represent the irreversible temporal succession, i.e. not the musical, metaphorical, but the literal temporal line. On the other hand, when he associates branching logic with a logic of events, he thinks of the idea that two superposed events are never identical (unless they are the same), contrary to points or periods that measure over time instants or intervals. Strictly, events keep their identities when they are superposed, forming ramification. It is in this sense he is going to speak

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<sup>546</sup> Ibid., p. 291.

<sup>547</sup> Dannenberg, 2002, p. 79.

about a branching order of the time of events, meanwhile point and period ontologies work easily with linear (rarely also with circular) ontology.

According to Edward Lippman, there are three forms of linearity:<sup>548</sup> progressive (a), syntactic (b), and sheer linearity (c). The first one was described by Monelle also as the most significant for the change effectuated between the 17<sup>th</sup> and 18<sup>th</sup> centuries in time perception, and as responsible of the birth of the sonata form. Syntactic linearity, in turn, is the most widespread; it recalls the idea of consequence, the one associated with narrative structure and the one which deserved Berger's attention. It is also the tonal directed linearity of Kramer. Dahlhaus added a nuance to this discussion, analysing in the context of syntactic linearity, teleological linearity as either dramatic–circular or exegetical–goal directed. The last linearity proposed by Lippman is generally taken as an extreme whose perceptual effects, however, are not of linearity but instead cause stasis and appeared lately in recent experimental music. This last is associated with what was described as total or pervasive linearity by Kramer.<sup>549</sup>

Linear logic of time is defined by properties of transitivity and connexity. The first property says that 'being an event before a second event, and given the existence of a third, the first is before that third one'. This property could apply without distinction to represent the cases a, b, and c of musical linearity. It looks trivial and innocuous. However, according to the next property of connexity, 'given two events one must be the antecedent and the other the consequent, irrestrictive of what of the both ones', there are differences between cases a, b and c. Connexity carries the idea of consequence. In the case of linearity, at (a) still the goal oriented time is in embryo, there is a process to be represented but it is yet not fully consequent; at (b), a structural necessity is envisaged; and at (c), there is an emphasised, strong consequence, although its effect is to be perceived as motionless. Summing up, although linear time logically speaking can give a very general account of linearity in terms of transitivity and connexity it does not prove sufficient or it does not have the capacity for expressing with accuracy, for modelling the different nuances appearing in music in this present formulation.

The following axioms operate in the Linear system CL of temporal logic presented by Cochiarella in 1966:<sup>550</sup>

- A1.  $FFA \supset FA$ . Transitivity: if an event is followed by two events, and if it is true from the first the future of the third event 'A', then from the second it will also be true the future of 'A'.

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<sup>548</sup> "Progressive Temporality in Music," *The Journal of Musicology*, 1984, pp. 121–141.

<sup>549</sup> Kramer, 1988, p. 63.

<sup>550</sup> See McArthur R. P., *Tense Logic*, 1976, p. 25.

A2.  $(FA \wedge FB) \supset (F(A \wedge B) \vee (F(A \wedge FB) \vee F(FA \wedge B)))$ . Linearity to the right: if an event 'A' is given in the future and an event 'B' is also given in the future, then they are identical, given at the same moment in the future, or one of them occurs in a posterior future with respect to the other.

A3.  $(PA \wedge PB) \supset (P(A \wedge B) \vee (P(A \wedge PB) \vee P(PA \wedge B)))$ . Linearity to the left: if an event 'A' is given in the past and an event 'B' is also given in the past, then they are identical, given at the same time in the past, or one of them occurs in an anterior past with respect to the other.

Then, the principal semantic properties belonging to the axioms:

$(\forall x) (\forall y) (\forall z) ((R(x,y) \ \& \ R(y,z)) \supset R(x,z))$ . This is the semantic property of transitivity according to the statement that if an event 'x' is before an event 'y' and this event 'y' is before an event 'z', then the event 'x' is before the event 'z'.

$(\forall x) (\forall y) (\forall z) ((R(x,y) \ \& \ R(x,z)) \supset ((z=y) \vee (R(y,z) \vee R(z,y))))$ . The semantic property of the connexity to the right demands that in respect to an event 'x', two events 'y' and 'z' occur later, then either are identical, or one of them happens later with respect to the other.

$(\forall x) (\forall y) (\forall z) ((R(y,x) \ \& \ R(z,x)) \supset (y=z) \vee (R(z,y) \vee R(y,z)))$ . The semantic property of connexity to the left demands that in respect to an event 'x', two events 'y' and 'z' happen earlier, then either are identical, or one of them is earlier in respect to the other.

The following amendments should receive the axiom for linearity (applied just to linearity to the right) if it should describe the different qualitative linear times in music:

Progressive linearity:

$$(FA \wedge FB) \supset (F(A \wedge B) \vee (F(A \wedge FB) \vee F(FA \wedge B)))$$

This is interpreted as 'there is non necessarily reinforced linearity'.

Syntactic linearity:

$$(FA \wedge FB) \supset (F(A \wedge B) \vee (\mathbf{N}(F(A \wedge FB) \vee F(FA \wedge B))))$$

Here, necessity should be incorporated.

Sheer or total linearity:

$$(FA \wedge FB) \supset (F(A \wedge B) \vee (\mathbf{N}(F(A \wedge \mathbf{N}FB) \vee F(\mathbf{N}FA \wedge B))))$$

Necessity is ‘emphasised’: it is not enough to articulate antecedent and consequent in a logic of consecution, here musical events must be unrepeatable.

Musical temporality could only be very generally approached by the logical one. A first possibility appears in the antecedent work of Marsden, but as established, from a more comprehensive philosophical point of view it leaves important things aside. In music, linearity implies more interpretations than the ontological, literal one: there are progressive, syntactic or tonal-consequent, with its dramatic and exegetical varieties, also atonal linearities can be included—whose necessary connections are qualitatively different from the pitch ones— and finally, total or pervasive linearities.

This hybrid position defended here describes linear time in music not just as sequences of literal arrangements of time periods or events, but also includes the musical sense in its many nuances, for example: *progressive* time as musically recreated; *teleological–exegetical* time concerning the fulfilment of an idea gradually announced, which inaugurates future, reveals at the end; or *teleological–dramatic* time, in that implies a thematic process ultimately seized by the musical form, a hidden plan that is actualized in the progress of the work, linearity which is dependent on the past. It also covers cases of *non-tonal linearity*, up to extreme cases of *total linearity* as in the latest extremes in contemporary music, where linear procedures become pervasive. Moreover, those musical linear times have a cultural history tied to them, which connects—although not always straightforwardly—with analogue time ideas current in the period when this music was born. Logical representations are, again, meagre for inquiring about all these nuances, although they provide a solid starting point.

Alfonso Padilla describes this general situation in the following passage:

In an absolute sense, objective, time is one-directional, linear, flows continuously, goes forward, is irreversible, one-dimensional. According to this situation all music is linear, directional, continuous. This means, it does not exist no-linearity, no-directionality, discontinuity, static, return, repetition. This, under an ontological and absolute point of view. Whether things were so simple, discussion ends here. As music is not a natural but cultural phenomenon, a human form of communication, and it is art, there are other things to be taken into account. Time, as a human being perceives it, is not independent of its experience. On the other hand, musical discourse, narrativity, drama, work with other categories than those of the objective and absolute of the exact sciences or formal logic. Art is, essentially, fiction, a symbolic form of representation. In that is fiction, music has the right of jumping the ropes of formal logic and the definitions of the natural sciences.<sup>551</sup>

Extra divergences with the sole logical approach would be in reproducing temporal processes in music that open new questions, such as how to represent multiple

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<sup>551</sup> Padilla, 1995, p. 115. Author’s translation.

temporalities in one, i.e. linear over cyclical, which may work in parallel. These would be contradictory for logical representations, which must choose one ontology.

If one would opt for an exclusively ontological perspective, so just as with philosophical discourse, one would miss the richer phenomena found in music in addition to the important connection between music with time ideas. If, on the contrary, one opted for the idea of a musical time without taking into consideration questions of abstract form or temporal logic, related to other domains where time arranges reality, music would stay separate from the rest of the temporal phenomena, which it paradoxically tries to represent, in the sense of being permeable to them. Temporal logic schemes put music in connection with time outside music; this should not necessarily imply reducing musical temporal connotations to abstract models that still cannot represent them.

### **5.1.1. Musical Analytical Framework**

There are two temporal levels for music: the real uninterrupted time and the conceptual time perceived in the work's internal organisation. According to Joan Stambaugh, "what is essential is not the concrete uninterrupted time in which the action takes place but rather the directedness of the action itself."<sup>552</sup>

This conceptual time, which is the most important here, can be *externally* described; this means that its shapes, the diverse notions of time different from the chronological, can be labelled. Also it can further be *internally* described; this means that the various phenomena of expressive timing, pacing, proportions, etc. added to this overall external shape also deserve an analysis. Those internal decisions over the external shape *concretise* the temporal configuration of a work in a sense that it was already suggested by Ingarden's ideas in the first chapter.

For a conceptual and external way of looking at the time of music, a first classification of musical linearity as 'Progressive', 'Syntactic', or 'Total' was introduced above. Syntactic linearity can also be considered 'Teleological' or 'Non-teleological', when looking at the differences in the configuration of direction and referring to whether the music is tonal or atonal.

The above mentioned main categories correspond to three different moments in the understanding of linearity. The first one, described by Monelle, is the musical linearity that coincides with the moment in the 1750s when a profane understanding of time was

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<sup>552</sup> "Music as a Temporal Form", *The Journal of Philosophy*, 1964, p. 265.



born. The second, as described by Dahlhaus, Kramer, and Berger, is a product of the consolidation of a way of experiencing time, as the utopic conquest of a freer humanity in cultural history. The last type of linearity, shows a last extreme: vacuous, devoid of meaning, automatic, and compulsive linearity; perhaps a desperate, negative side of the experience of progress.

Progressive linear time illustrated with the music of Sweelinck by the Dutch scholar Fritz Noske, is defined by “processes of canon and diminution [that] engender a feeling of steady quickening, a series of ‘micro-strettos’ which contribute to a ‘macro-stretto’ that characterizes the whole piece.”<sup>553</sup>

According to Monelle, Sweelinck’s music converged with the Italian tradition of Corelli and Antonio Vivaldi (1678-1741). Later, with Bach, appears a polychronicity, i.e., a conjugation of lyric and progressive times.

If we begin early in the century, we find at first a distinctly polychronic scene. In Bach’s music time can be manipulated to move variably and to diversify in the moment. There are lyric times, retardation and acceleration, times of variable lapse, temporal simultaneities, and stabilized time. Directioned, goal-oriented time is embryonic.<sup>554</sup>

Monelle presents examples showing the way lyric time is extended into progressive time in Bach. The simple addenda of redundant phrases in a passage where the music goes at the end finally to the dominant, would lead to a progressive, goal-oriented time, that proper of Beethoven’s music. Still, Monelle adds, the sense of progression was ‘concentric’, in that there was not yet a necessity of progressing from one motive to another, or of resolving any conflict. As Monelle explains, the importance of transition (*gang*) in this passage from lyric to progressive time is essential.

Another perspective was developed by Kramer. As mentioned, he presents linearity in a variety of ways: tonal (called here ‘teleological’) and atonal (‘non-teleological’), both predictable and non-predictable.<sup>555</sup>

Predictable teleological (tonal) time is exemplified by Kramer with Beethoven’s String Quartet No. 7 in F Major, op. 59. Since Western music created the sophisticated system called ‘tonality’, tonal motion is always goal directed, to the arrival of the tonic; and even pieces that end with keys other than the tonic depend on the denial of this expectation as an expressive effect, according to Kramer. Composers play on the expectation of a recapitulation as a structural downbeat, and the process of choosing

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<sup>553</sup> Monelle, 2000, p. 97.

<sup>554</sup> Ibid., p. 99.

<sup>555</sup> Kramer, 1988, pp. 25–40.

when and how to undercut the recapitulation downbeat depends on implications set up earlier in the piece.

Let us refer specially to his example of Beethoven's String Quartet No. 7, 1<sup>st</sup> movement. After the development the composer presents a sequence of five attempts to reach the recapitulation. He shapes the recapitulation in this particular way because of implications suggested at the beginning of the piece: an unstable harmony that could never serve as a clear point of arrival at the beginning of the recapitulation. As Kramer explains, this situation defines the essence of tonality: the wait for the explanation of what one heard in the beginning. It is to some degree logically predictable.

We can compare Beethoven's example brought by Kramer with that chosen here for linear music from Ginastera. Ginastera's *Allegro marcato* from the Piano Sonata No. 1, op. 22, consists of melodic and rhythmic variations growing from the opening theme. Its development is a consequence of a first 'statement' situated at the onset of the work. Beethoven's procedure is synthetic, i.e. the play around a central 'statement' that is presented at the end, and Ginastera's is analytic, providing the necessary information from the onset.

Illogical or unpredictable events can also occur inside goal directed linearity. Kramer uses the 1<sup>st</sup> movement of Beethoven's String Quartet No. 15, op. 132, in A minor, as an example of this. Following a progression, which seems to go to a cadence in C minor, there is an interrupting silence in m. 92, followed by surprisingly recitative-like material. It is an unrelated interruption without precedent and motivic outcome. In this context, according to Kramer, it is still possible to perceive linear consequences when listening to it. What we experience is that any subsequent continuity may be shattered, so this proceeding is based on the subversion of linear expectations as an expressive effect.

Kramer explains that early atonal composers, in the absence of the tonal system's *a priori* goal definition, faced the challenge of creating cadences contextually. Non-pitch parameters, traditionally treated as secondary support of harmonic, rhythmic and linear motion of tonal music, began to have a structural function, in order to compensate for the absence of tonal, unequivocal goal definitions. Goals are defined either by rhythmic and textural factors, or in context, by previous reiteration and emphasis.<sup>556</sup> In consequence, one may not distinguish a cadential harmony until it actually arrives; it is unpredictable, different from tonal drives towards cadences.

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<sup>556</sup> Ibid, p. 408, n. 26.

In Alban Berg's *Kammerkonzert* (1925), the first phrase (excluding the introductory *motto*) ends in m. 7. There are pitch factors indicating this measure as cadential. The final E–C is the goal, given a preceding E in the oboe and the stepwise motion to C in two voices. E and G define a harmonic area in mm. 1–6. The voices move linearly towards the goal. The cadence is however principally made by non-pitch parameters, which promotes the stepwise pitch motion to a goal defining status. Cadences provoked by non-pitch parameters can be elaborated by slowing tempo, lengthening note durations, thinning texture, decreasing dynamics, downward motion after an overabundance of rising figures, less frequent change of instrumental colours, or the freshness of subsequent music.

On the other hand, atonal composers can also attempt to create predictable goals contextually by means of reiteration or emphasis. The example by Kramer is Schoenberg's *String Quartet N. 4* (1937) where he creates levels of goal transposition. In this work (similarly to tonal music) the goal is predictable and known in advance.<sup>557</sup>

As a consequence, the cadence is a result of pitched and non-pitched procedures. Whereas non-pitched support of cadences is also common in tonal music, there the pitch carries the weight of the cadence. According to Dahlhaus, this carries a contradiction: atonal procedures make efforts of teleology within the wrong medium. The contradiction would be in overcoming tonal language but continuing to achieve the same effects.<sup>558</sup>

Kramer explains that the disintegration of linearity began with its intensification. Tonal vocabulary became richer in chromaticisms towards the end of the 19<sup>th</sup> century and the urgency of music's goal-directedness increased. Later romantic music, explains Kramer, as Brahms' *Intermezzo* in E Minor, op. 116, No. 5 (1892), is always searching for goals that only occasionally materialize. This music seems to consist mainly of structural upbeats. Progressions are defined in the foreground more by voice-leading of moving harmonies than by tonal harmonies that are restricted to large articulations in the background; previously, harmonic root progressions in the background had functioned as the primary support of large scale harmonic movements.

The atonal idiom of the early music of Schoenberg (*Sechs kleine Klavierstücke*, op. 19, 1911) resulted from the disappearance of background tonal harmonies. The stepwise motion in the foreground is retained to achieve continuity of melodic lines but the definition of large scale goals for this motion becomes problematic. Consistencies of set types underlie much of this music; the number of set types is limited to create pitch or

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<sup>557</sup> Ibid., p. 408, n. 28.

<sup>558</sup> Dahlhaus, 1988, p. 292.

interval class invariances that ensure consistent contexts. Set analyses have uncovered nonlinear rather than linear means of progression.<sup>559</sup>

Finally, under the title “Recent Attempts at Total Linearity and Nonlinearity”, Kramer tackles the music of the 50s and 60s that approached the extremes of total linearity and nonlinearity. Linearity and non-linearity as compositional procedures do not guarantee linearity or nonlinearity of musical time. He uses Lejaren Hiller and Leonard Isaacson’s *Illiac Suite*, for string quartet (1957) as example.<sup>560</sup> Here, the intention of total nonlinearity does not guarantee the perception of such a time. On the contrary, linear intention leads to nonlinear perception in Elliot Schwartz’s Chamber Concerto I (1977). The extremely linear processes of this music present nonlinear components, as for example in Frederic Rzewski’s (b. 1938) *Les Moutons* (1969). This new music is not only experimental, it offers deeply felt responses to new meanings of time in 20<sup>th</sup> century Western culture.

### **5.1.2. Linear Time in Ginastera’s Sonata para piano op. 22 No. 1/I (1952)**

Alberto Ginastera (Buenos Aires, Argentina, 1916 – Geneva, Switzerland, 1983), mastered a compositional language in the delicate encounter between the modern European techniques and the Argentinian traditions. Argentine folk songs and dances inspired his music, whether in direct reference (the period he called ‘objective nationalism’) or in stylistic allusion (‘subjective nationalism’). Later in his career he adopted 12-tone techniques and avant-garde procedures (‘neoexpressionism’), ultimately reaching a synthesis of traditional and postserial elements in his last ‘synthetic period’.<sup>561</sup> A first periodization of his output was prepared early in his career by Ginastera himself; more recently, Malena Kuss and Antonietta Sottile presented objections to the periodization of a trajectory of a unique aesthetic search that was continuous and constant.<sup>562</sup>

Some of the most renowned scholars that have dedicated themselves to the study of his music are Pola Suárez Urtubey, Melanie Plesch, Malena Kuss, Guillermo Scarabino, and Deborah Schwartz-Kates, among others. Recently, works by Antonietta Sottile and

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<sup>559</sup> Kramer, 1988, p. 408, N. 25.

<sup>560</sup> Ibid., p. 411, n. 64.

<sup>561</sup> Schwartz-Kates, Deborah, "Ginastera, Alberto." *Grove Music Online*.

<sup>562</sup> *Alberto Ginastera: A Complete Catalogue*, Introduction, 1986; Le(s) Style(s) d’ Alberto Ginastera (1916 – 1983), 2005.

Erik Carballo updated and expanded this corpus of research. From a political point of view, studies by Omar Corrado and Esteban Buch, open a new front of analysis in the context of music and politics.<sup>563</sup> Ginastera's position according to these authors is not only artistic but politically situated in the dialectic nationalism-universalism, which they read under the dialectic fascism-liberalism of Ginastera's time.

Available listings of Ginastera's output take into account the language (tonal, atonal) as well as the aesthetic choice (folkloric or 'pure'). They find a continuity from the folkloric to the pure, a constant dialectic between each other. This section will investigate linearity in Ginastera's tonal music; the following sections treat circular time in his mythical-inspired music, and branching time in his modern music. These connections are supported by other studies' by Carballo, Julio Ogas, and Dante Grela,<sup>564</sup> providing a philosophical interpretation of Ginastera's music temporal meanings.

Ginastera wrote the first Sonata for Piano for the occasion of the Pittsburgh International Contemporary Music Festival of 1952. The work was commissioned by the Carnegie Institute and the Pennsylvania College for Women.<sup>565</sup> It was later chosen to be performed at the 17<sup>th</sup> Festival of the International Society for Contemporary Music in Oslo, 1953.

Enough previous studies focus on Ginastera's work from the technical and interpretative point of views. For this sonata, the analyses of Wallace,<sup>566</sup> for its syntactical approach, and Ogas, for its semiotic points of view, are considered.

As Ogas explains in the introduction to the Sonatas for piano, Ginastera composed the first in a traditional scheme of introduction, development, and conclusion. For Ginastera, composing this first sonata was a step towards consolidating his nationalist language in large-scale formal structures, i.e. sonata form. The sonata belongs to his subjective nationalist period, coinciding with his maturation as composer, summarized by Ginastera as follows:

A style that, without abandoning Argentine tradition, had become wider or with a more universal amplification. It was not as in the early period linked to genuinely creole themes or rhythms, but

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<sup>563</sup> Corrado, Omar, *Música y Modernidad en Buenos Aires. 1920–1940*, 2010; Buch, Esteban, *The Bomarzo Affair, Ópera, pervisión y dictadura*, Adriana Hidalgo ed., 2003.

<sup>564</sup> Carballo, Erick, *De la Pampa al Cielo: The Development of Tonality in the Compositional Language of Alberto Ginastera*, 2007, and "El tiempo latinoamericano en la música de Ginastera", 1996, pp. 146–174; Ogas, Julio, "Las sonatas para piano de Alberto Ginastera como textos neomitológicos", *Resonancias*, 2002, pp. 33–74; Grela, Dante, "Identidad cultural y creación musical en Latinoamérica: La Cantata para América Mágica, de Alberto Ginastera", *Revista del Instituto Superior de Música*, 2001, pp. 85–99.

<sup>565</sup> Alberto Ginastera, *Sonata para piano*, Buenos Aires, Barry, 1954; reprinted by permission of Boosey and Hawkes, Inc., sole agents.

<sup>566</sup> Wallace, David E., *Alberto Ginastera: An Analysis of his Style and Techniques of Composition*, 1964.

the Argentine feeling was created through an atmosphere full of symbols. The Sonata for piano, for example, or the *Variaciones concertantes* do not have a single popular tune and have, nevertheless, a language recognised as typically Argentine.<sup>567</sup>

The 1<sup>st</sup> movement of this first sonata for piano is characterised by a constant movement of thirds moving forward. This type of propulsive linearity defines tonal centers although the sonata is composed using a polytonal language. Progressive, propulsive time is defined not only by harmonic, but also by melodic, metric, and rhythmic resources that contribute to this interpretation.

Temporal consequence can be found in melody and rhythm working on variations from the first theme. The whole movement also displays syntactic linearity since it is a consequence of the first eight measures of music. Concerning the contrast between thematic motives, measures 7 and 8 of theme A are the basis for the construction of theme B. According to the systematic semiotic analysis by Ogas, both display the 'creole' and 'native' syntagmas respectively. The first one is alluded to by the use of creole folkloric species from the Pampa region, the Cuyo region, and the Central-North of Argentina. The second, the native theme, is inspired by dances and songs based on pentatonic scales (in this case, a hybridization of pentatonic and heptatonic scales) of Inca lineage. See Example 2: (a)–b–(c)–d–e–f#–g#.

The image shows a musical score for the first movement of Sonata op. 22, marked 'Allegro marcato' with a tempo of 288 (♩ = 144, ♩. = 96). The score is for piano and consists of two systems of staves. The first system shows the beginning of the piece with a treble and bass clef, a 3/4 time signature, and a forte dynamic. The second system continues the piece with similar notation. The score features complex harmonic structures with many accidentals and a strong sense of forward motion.

Example 1. Sonata op. 22, *Allegro marcato*, mm. 1–8

<sup>567</sup> Suárez Urtubey, *Alberto Ginastera en cinco movimientos*, 1967, p. 25. Author's translation.



Example 2. Sonata op. 22, *Allegro marcato*, mm. 50–65

Contrasting themes implying narratives of creolism and indigenism (themes A and B) add evidence also for the idea of a logic of consecution; reaching final obstinacy, they have the purpose of defining the product of that mix. It is by this hidden topic that the sonatas for piano of Alberto Ginastera are examples, according to Ogas, of what Juri Lotman (1922–1993) called the neomitological (musical) discourses in the 20<sup>th</sup> century.<sup>568</sup>

Ginastera's sonata is described in terms of progressive, propulsive linearity and also as showing both the 'exegetical' and 'dramatic' types of teleological linearity in the sense of Dahlhaus. The syntactic (also called here teleological) linearity in this sonata has a complex duality. It is partially exegetical, generating harmonic, metric, rhythmic time, 'leaving past behind'; but inserted in a dramatic mould, interpreted from the thematic contrasts but founded in similarities. In consequence, the present, at the same time that goes backward to the past, inserts a progress towards the future. As if getting back to the roots would propel a life (and a country in this case) ahead. The work as a whole is ultimately read as having links with wind as its primary element, remembering its vehement impulse, impetus, and obstinacy.

Another observation is about the general character of lively movements of Ginastera's sonata in opposition to the grave ones. Lively movements have to do with hope, while slow movements relate to contemplative feelings. Strong and obsessive rhythms convey masculine dances; the contemplative is associated with the calm atmosphere of the Argentinian Pampas or the silent night of the Andean Puna.

The structure of the first movement, *Allegro Marcato* implies an Introduction: measure 1 to 53 (theme A), and measures 53–83 (theme B); measures 84–101 develops

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<sup>568</sup> Ogas, 2002, p. 34.

themes A and B; recapitulation from measure 138 in the form of A (B) A. Regarding the departure tonality and following tonalities, there is always a tonal center, in this case C.

A first aspect to note is that of metrical variation leading to a progressive linear time. There is a profuse variety of metrical signatures in measures 84–88. For example: 9/8, 3/4, 6/8, 5/8, 3/4, elaborated in the form of quick changes. Secondly, the rhythmical aspect is constructed by rapid shifts among eighth note, quarter-note, and dotted-quarter note units causing the mentioned fluid rhythmic quality.

Linearity of more concise moments, abridged, condensed, in expressive gestures, jointly with an accelerated pacing, are vestiges of particularity. Something to consider also is the immediate dispatch of the theme A and in its brief construction in two measures.<sup>569</sup>

The position of a logico-philosophico perspective aims to gain a contextual interpretation of linearity, in this case within the particular context of the music of Ginastera. At the same time a vocabulary from which to make the comparison with other forms of linearity, to localize the temporal ideas in a broader context beyond music, linking it with cultural and philosophical ideas on temporality. It rests on the idea of a logic which is exclusively musical although inspired by speech models.

There are two last considerations suggested in Ogas' article. This first Sonata can be contrasted with the third last for piano, Sonata op. 54, "Impetuosamente", in that here the time employed in the former is that of a 'formal unfolding', whereas in the latter the 'lived', 'vital time', is emphasised, considering the particular situation in which this last Sonata was composed, with the imminent death of its author.<sup>570</sup>

A second consideration is that of a political situated time. This time evoked by Ginastera intuits later forms such as that recently reinvigorated in Latin American politics in general. In this sense, Ginastera's political message cannot be exclusively seen within the context of the Argentinian partidism (as it can be found in Corrado's perspective), but in a more amply vision of pan Americanism:

In avoiding the representative figure of the cosmopolitan 'porteño', the 'compadre', he avoids the musical characterisation of the Argentinian at international level, i.e. the tango, and puts emphasis in the national folkloric elements that share characteristic traces with the majority of the Latin American folkloric species.<sup>571</sup>

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<sup>569</sup> For social time in general, Levine R., *A geography of time: the temporal misadventures of a social psychologist, or how every culture keeps time just a little bit different*, 1997.

<sup>570</sup> Ogas, 2002, pp. 65–66.

<sup>571</sup> Ibid., p. 54. Author's translation.



## 5.2. Music and Cyclical Time

In “The Time”,<sup>572</sup> part of a series of oral lectures, Borges’ uncertainty about time is spontaneously described. The problem of time would be essential in that we cannot negate it while we have consciousness; something different seems to happen with space. In other words, we cannot negate succession: our consciousness is all the time passing from one state to another.

His pessimism begins to show through, when he notices that there were no big advances in the solution of the problem of time. Rather, we still continue wondering about the same paradoxical thing: that time passes (“nobody descends two times to the same river”) and that it does not pass at all (that there is memory, which is on the other hand, “made of forgiveness”).

Other perplexities ascribed to time as a philosophical problem, Borges develops more fully in “History of Eternity”.<sup>573</sup> Such “inner obscurities” are for instance the direction of time, in that it is uncertain if it comes from the past or from the future; also the synchronization of personal time with mathematical one; finally, the fact by which movement has been already refuted by the Eleatic.

Nevertheless, history have provided solutions to the problem of time: Plato’s idea of time as a “mobile image of eternity” in *Timeus* is one of them. This solution appears to Borges however as a “beautiful human invention”. Plato’s solution had its successors: Plotinus (205–270 AC), who in his *Enneads* also deduces time from eternity, at least a model of it. In fact, according to Borges the “bible” of western eternity is Plotinus’ *Enneads* V. There, Plotinus presents a list of pieces compounding eternity: difference, equality, motion, quietness, being.<sup>574</sup> The resultant is “an eternity poorer than the world”.

In revisiting the history of eternity, Borges continues with the second “beautiful invention”, that of the Christian period, whose bible would be now the XI book of Saint Augustine’s *Confessions*. According to the Christian doctrine, the Verb by the Father, and the Holy Spirit by the Father and the Verb, were generated. Gnostics inferred from these operations that the Father was *former* than the Verb, and these two, *before* the

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An exception to this rule is in Preludios Americanos N 8, ‘Homenaje a Juan José Castro’, where the composer uses a tango rhythm.

<sup>572</sup> Borges, 1978.

<sup>573</sup> Borges, 1936. Author’s translation, except when other is mentioned.

<sup>574</sup> *Ibid.*, p. 27.

Holy Spirit. This inference would dissolve the mystery of the trinity. Bishop Ireneo (130–202 AC) clarified that this double process had not happened *in* time, but in eternity, that joints past, present and future. Such clarification became dogma, and the idea of eternity was born. Finally, this notion of eternity was inseparable of the idea of the trinity as we have seen before, and the trinity had to be kept in order to explain the direct sending of God to the humans and his sacrifice of having been revealed as a human and having died, crucified.

The notion of eternity as divine attribute can be explained in comparison with our capacities. We perceive the real facts and imagine the possible ones; in God there is no such a distinction, which belongs to ignorance and time. His eternity registers at one time not only all the instants of this world, but also the impossible ones. His eternity would be much more copious than the universe. This eternity, based on omniscience, becomes a new structure of time in “The Garden of Forking Paths”.<sup>575</sup>

Contrary to the above-mentioned tradition, that of the Greek and the Christian, Borges is going to add a curious version of eternity. In Borges’ words: “eternity is an image made of the substance of time”.<sup>576</sup> But we have to stop here and explain first why Borges infers such a conclusion, which reverses the previous ones.

For him, platonic eternity supposes the doctrine of the “immobile and terrible museum of archetypes”. In other words, it is consequence of the “obsession” of speaking about individuals as belonging to a general species comprehending them. On the contrary, Borges ascribes to the nominalist doctrine. And although he is going to concede in a footnote that “the generic can be more intense than the concrete”,<sup>577</sup> he believes that what exists is the material, not the form, and that the universal is simply a name.<sup>578</sup>

The Borgesian eternity is conceived as “a poor eternity already without God, and even without any other possessor and without archetypes”.<sup>579</sup> It was formulated in *El idioma de los argentinos* (The Language of the Argentinians), from 1928. The piece was entitled “Sentirse en muerte” (Feeling in death). It tells of Borges’ experience of eternity one night while he was walking in the suburbs of Buenos Aires and suddenly he contemplated a rose-coloured boundary wall. Afterwards, the fragment:

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<sup>575</sup> Borges, 1941.

<sup>576</sup> Borges, 1936, p. 44.

<sup>577</sup> *Ibid.*, p. 25.

<sup>578</sup> The relationship of Borges with nominalism is discussed in Mateos, Zulma, “Conocimiento y mediación lingüística en Jorge Luis Borges”, Alfonso de Toro ed., *Jorge Luis Borges: Ciencia y Filosofía*, 2007, pp. 125–128.

<sup>579</sup> 1936, p. 44.

I kept looking at this simplicity. I thought, surely out loud: This is the same as thirty years ago... I conjectured the date: a recent time in other countries but now quite remote in this changeable part of the world. Perhaps a bird was singing and for it I felt a tiny affection, the same size as the bird; but the most certain thing was that in this now vertiginous silence there was no other sound than the intemporal one of the crickets. The easy thought 'I am in eighteen-nineties' ceased to be a few approximate words and was deepened into reality. I felt dead, I felt as an abstract spectator of the world: an indefinite fear imbued with science, which is the best clarity of metaphysics. I did not think that I had returned upstream on the supposed waters of Time; rather I suspected that I was the possessor of a reticent or absent sense of the inconceivable word *eternity*. Only later was I able to define that imagination.

I write it now as follows: That pure representation of homogeneous objects—the night in serenity, a limpid little wall, the provincial scent of the honeysuckle, the elemental earth— is not merely identical to the one present at that corner so many years ago; it is, without resemblances or repetitions, the very same. Time, if we can intuitively grasp such an identity, is a delusion: the difference and inseparability of one moment belonging to its apparent past from another belonging to its apparent present is sufficient to disintegrate it.<sup>580</sup>

Returning to the discussion of the solutions given in the history of philosophy, it is clear how the problem of time has not been yet solved. To explain its nature through eternity did not convince Borges, principally, because eternity was made of time. We have to move now to Borges' discussions about the principal metaphysical thesis about time in its three versions: linear, circular, which is the main objective in this section, and branching.

In "New Refutation of Time",<sup>581</sup> Borges develops a speculative philosophical argument about the nature of time. The novelty of this essay is in applying George Berkeley's (1685–1753) tools (his *esse es percipi*) but now to time. In this context, the writer quotes the masters of the idealism Berkeley and David Hume (1711–1776) saying:

Berkeley negated that an object exists behind the impressions of the sense; David Hume, that a subject exists behind the perception of changes. The first has negated the material, the second the spirit; the first did not want that we add to the succession of impressions the metaphysical notion of Material, the second did not want that we add to the succession of mental states the metaphysical notion of Subject.<sup>582</sup>

Borges continues towards his goal, that is, the refutation of time via these same principles: "Out of every perception (actual or conjectural) it does not exist, the

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<sup>580</sup> Ibid., pp. 46–47. English translation from *Labyrinths. Selected Stories and other Writings*, Yates, Donald A. and Irby, James E., 1962, pp. 226–227.

<sup>581</sup> Borges, 1947.

<sup>582</sup> Ibid., pp. 767–768.

material; out of every mental state it does not exist, the spirit; neither time would exist out of the present instant.”<sup>583</sup>

Borges has extended with this argument the tools of idealism to the problem of time, resulting from this application the negation of the idea of a temporal succession beyond the ‘now’.

The refutation of the linear succession of time implies also another refutation, that of the synchronism of the terms of two series. “I negate, in a number of elevated cases, the successive; I negate, in a number of elevated cases the contemporaneous also”<sup>584</sup>. The negation of the contemporaneous means that every state is absolute and autonomous, that what really exists is every moment that we live without sharing time with a set of contemporaneous events.

But it is interesting to go further and show Borges’ following demonstration of why time does not exist as linear succession:

Let us consider a life in whose course there is an abundance of repetitions [...]. I suspect, however, that the number of circumstantial variants is not infinite: we can postulate in the mind of an individual [...], two identical moments. Once this identity is postulated, one may ask: Are not these identical moments the same? Is it not one single repeated term sufficient to break down and confuse the series of time?<sup>585</sup>

At this time Borges remembers his own version of eternity described whereas he walked around the suburbs of Buenos Aires and suddenly contemplated the rose-coloured boundary wall. The arguments of idealism now had left him one more time in front of eternity, although “the richer” one.

The incipient idea Borges is trying to convey is that formulated in natural philosophy as the thesis of presentism.<sup>586</sup> Rowell spoke of presentism for example in music when describing ‘particularist’ procedures in Japanese music. “[P]articularity—the enjoyment of the uniqueness of things, the individual sound, the hook that is a permanent fixture in every Nō theater but required for just one play in the repertoire”<sup>587</sup>.

Circular time, or a time made of repetitions instead of successive passages is going to be analysed in Borges’ “The Doctrine of Cycles” and “The Circular Time”<sup>588</sup>. In “The Doctrine of Cycles” Borges analyses the figure of cyclical time especially as Nietzsche

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<sup>583</sup> Ibid., p. 768.

<sup>584</sup> Ibid., p. 762.

<sup>585</sup> Ibid., p. 769. English translation from *Labyrinths*, 1962, pp. 223–224

<sup>586</sup> Markosian, Ned, “Time”, *The Stanford Encyclopedia of Philosophy*, ‘Presentism, Eternalism and the Growing Theory of the Universe’.

<sup>587</sup> Rowell, 1983, p. 196.

<sup>588</sup> Borges, 1934 and 1943.

presented it under the figure of the eternal return. This doctrine believes that given a finite number of atoms in an infinite time, the number of possible permutations of them has to be reached and repeated once and again.<sup>589</sup> Nietzsche, by the way, had spoken about energy instead of atoms.

According to Borges, a refutation of such doctrine could be found in the set theory presented by George Cantor.<sup>590</sup> The mathematician affirmed the perfect infinity of the number of points in the universe, contrary to the belief of a finite number of them. His approach was essentially to adopt the idea of one-to-one correspondence (bijection) as a standard for comparing the size of sets, and to reject the view of Galileo (which derived from Euclid) that the whole cannot be the same size as the part. An infinite set can simply be defined as one having the same size as one of its parts. According to Borges, the resultant proposition is that if the world has an infinite number of terms, as stated by Cantor, it is capable of infinite combinations, and Nietzsche's theory is refuted.

Borges continues discussing a second argument against the eternal return. For instance, the fact by which the remembrance would be a *novelty* in the usual sensation of "having already lived this moment", presented this fact as a favourite justification by the defenders of the eternal return. This argument negates the essence of the argument of the eternal return, in that remembrance itself would be an unexpected added experience.

A third point of attack to Nietzsche's doctrine is its appealing to energy. Borges remembers: the second law of thermodynamic declares that there are irreversible processes (for instance, from warmth to light). This would annul the "circular labyrinth" of the eternal return. Borges concludes here:

Zarathustra's thesis accepted, I do not finish comprehending how two identical processes are but agglomerated in one. Is it sufficient the mere succession, not verified by anyone else? Lacking a special archangel who takes the account, what does it mean the fact that we pass through the cycle thirteen thousand, five hundred and fourteen and not the first of the series or the number three hundred and twenty two with the exponent two thousand? Nothing, for the practice—which does not harm thought. Nothing, for the intelligence—which is serious.<sup>591</sup>

It is clear now that Borges admits the existence of *similar* moments that can be described as the same moment, as in the case of the ecstatic experience in the suburbs.

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<sup>589</sup> Nietzsche, Friedrich, *The Gay Science* (1882) and *Thus Spoke Zarathustra* (1883–1885).

<sup>590</sup> See Ferreirós, José, "The Early Development of Set Theory", in the *Stanford Encyclopedia of Philosophy*.

<sup>591</sup> Borges, 1934, p. 113.

But it is a delusion for him to speak about several times in which the *same* is lived, as Nietzsche thought.

In the next essay on “The Circular Time”, Borges displays an historical account. Accordingly, he begins with Plato, especially with his statement in *Timeus* 39 that the planets having equilibrated speeds will return to the initial point of departure. This argument was afterwards modified by the astrologers of that time: if the planetary periods are cyclical, also the universal history will be. Having ended a platonic year, all the individuals will be born again and will fulfil the same destiny. Historically conceived then, the first apparition of the eternal return is of an astrological kind.

Continuing in history, Borges mentions again Nietzsche’s purpose, the eternal return of the same. Borges quotes however in this opportunity an observation made by Bertrand Russell. It consists in the following thesis: the posterior state is numerically identical to the anterior; we cannot say that this state occurs two times, in that this would postulate a chronological order that the thesis prohibits.

The hypothesis that the history is cyclical can be formulated in this way: let us form the set of all the contemporaneous circumstances of a determined circumstance; in certain cases all the set is earlier to itself.<sup>592</sup>

Russell is here speaking about the structure of circular time as the formal theory of time or temporal logic conceives it, as a reflexive and symmetrical structure.

As a third interpretation of the doctrine of cyclical time, Borges presents his own vision. “The less terrible and melodramatic, but also the only imaginable”: The conception of *similar, not identical* cycles. He notices an infinite list of sources ascribing to this thesis, but he chooses to cite Marco Aurelio in a passage where the orator negates both the reality of past and future for claiming the present (remember “New Refutation...”) and negates whatever novelty. Regarding the negation of novelty, the conclusion would be: If all destinies are the same destiny, the universal history is that of one man. But Marco Aurelio affirms the analogy not the identity of individual destinies. So, whatever lapses, they have integrally the history. The number of perceptions, of emotions, of thoughts, of human vicissitudes is limited, and before death we are going to exhaust them.<sup>593</sup>

This adherence, to a no more plain than modest vision of time, is the product of Borges’ pessimism. In fact, if we go over “The Garden...” that we are going to analyse afterwards, we are going to see a much more broadened image of time, the branching;

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<sup>592</sup> Russell, Bertrand, *An Inquiry into Meaning and Truth*, 1940; See Borges, 1943, pp. 120–121.

<sup>593</sup> Marco Aurelio, *Meditations*, Book II, 14.

this last pregnant image is however only given through words, mere literary fictions; it is not given to our intelligence, but only to our intuition.

Until now for Borges, time is neither succession, nor the eternal return of the same, although of the similar. Finally, it seems to be a labyrinth of possible paths of whom we would be only conscious of the current ones. For the classification of cyclicity in music, all the models presented through the previous discussions: presentness, circularity (with the same events) and cyclical time (with similar events) are going to be analysed.

For a nearer vision of cyclicity in the music of Alberto Ginastera, it is interesting to concentrate for a while on the cyclic conception of space and time in the pre-hispanic Andean world.<sup>594</sup> The aim is to consider these conceptions in the actual Andes; this introduction shows the way temporal ideas get flesh in determined regions and communities and expand in the music that is produced around these centers.

A term relevant in the context of Latin American mythological conceptions is *Pacha*. *Pacha* means the world, the universe, space and time. The Andeans conceived space as having defined regions. The upper and the lower plus a centrum which are called respectively: *Hanan Pacha* (upper), *Urin Pacha* (lower), *Tiksi Muyu Pacha Chawpi Ukun* (center). *Hanan Pacha* and *Urin Pacha* have four divisions each, *Chincha*, *Colli*, *Anti y Kunti*, belonging to North, South, East, and West.

The lower world has a center, which is Cuzco. The same divisions, plus some extra, are applied to this habitational space, modelled in the bigger map of the universe. Cuzco has its center, the Koricancha temple and its lower and upper spaces.

*Pacha* is also time. Time is defined as ‘relative, cyclical and milenarist’: “Present time is going to generate past and future for being replaced by the earlier past that is at the same time immediate future.”<sup>595</sup>

*Pacha* as ‘time’ is divided in *Wayma Pacha* or *Soqa Pacha* (antique time or past which is also the mediate future), *Wayma Pacha Kay Pacha* (the immediate future which is also the most antique past), and *Kay Pacha* (present time, generates the immediate past and the mediate future).

*Wayma Pacha* or *Soqa Pacha* is at the same time divided into two: the immediate (nearest to present) and the mediate (farthest) past. As a consequence *Pacha* as time is divided:

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<sup>594</sup> Valderrama, Abdón Yaranga “La concepción del mundo o cosmovisión en la civilización andina”, in Steger Hanns-Albert (Ed.), *La concepción de tiempo y espacio en el mundo andino*, 1991, pp. 43–67.

<sup>595</sup> *Ibid.*, p. 48.

- into two: *Wayma Pacha* (past and future) and *Kay Pacha* (present).
- into three: *Wayma Pacha* (immediate and mediate past), *Wayma Pacha Kay Pacha* (the most antique past and immediate future), *Kay Pacha* (present).
- into four: *Wayma Pacha I* (immediate past), *Wayma Pacha II* (mediate past and mediate future), *Wayma Pacha Kay Pacha* (the most antique past and immediate future), *Kay Pacha* (the present).

Summing up, this cyclical view of time works as follow:

The man in his unit Being-Existence (to be on time and history within a framework of to be in a specific geographical space), moves from one space-time X to X' to X'' to X''' then X to restart cycle by keeping its unity of Being-Existence and within the time-space X. The passage of man from one cycle to another involves a qualitative jump. The unit humanity/time-space moves in a circular form from Z to Z' to Z'' to Z''' to return to Z and continue the cycle but within Z.<sup>596</sup>

Each of the fourth periods of Andean time has a thousand years. Each is divided into five hundred years, the great unity comprising four thousand years. The qualitative jumps are every five hundred, every thousand and finally, every four thousand years, which is the complete qualitative change.

Finally, the year of 365 days is a thousandth of *Kay Pacha* (present time) and it is also divided:

- into two: *Chiraw Pacha*, drying times and *Paray Pacha*, rainy times.
- into four: defined by solstices and equinoxes
- into twelve months of thirty days or three weeks of ten days each.

In temporal logic, the axioms that express circular time are (See Figure 7):

1. Reflexivity: if always in the future an event 'A' is true, then 'A' is true. ( $GA \supset A$ , It *will always be* the case that A, then A).

The property of reflexivity means temporally that an event 'x' is before itself. (A relation is reflexive when an entity has a relation with itself, i.e. *to be identical to*). ( $(\forall x), R(x,x)$ ); for all x, x is identical to itself.

2. Symmetry: if an event 'A' is always true in the future, then 'A' is always true in the past. ( $GA \supset HA$ , It *will always be* the case that A, then it *has always been* the case that A).

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<sup>596</sup> Ibid., p. 43. Author's translation.



The property of symmetry means temporally that given two events 'x' and 'y', x is before y and y is before x. (A relation is symmetrical when if x has the relation with y, y has it with x, i.e. *to be cousin of*).  $((\forall x) (\forall y) (R(x,y) \supset R(y,x))$ ; for all x, for all y, if x is earlier than y, y is earlier than x.

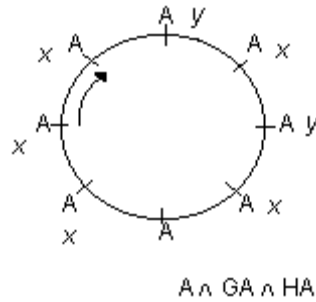


Figure 7

As shown by Marsden, it is still possible to give certain notion of *direction* to the circle. Two options for expressing this are: 1. the 'immediate precedence' relation (a binary relation in circular time defined by non-transitivity, applied to discrete texture) and 2. The relation of 'betweenness' (a ternary relation, not restricted to a discrete texture). By 'immediate precedence' it is meant 'if x immediately precedes y and y immediately precedes z, then x cannot immediately precede z'. By 'betweenness', it is meant 'if y is in between x and z ('x, y, z'), then z is in between y and x ('y, z, x') and x is between z and y ('z, x, y'), coming back to the first situation of y being in between x and z'. Also, a helix-like shape involving both circularity and linearity was designed for imperfect circular music and a notion of a lead-in point amidst circularity, for representing actual beginnings.

As happened with linearity as a logical representation for music, being too restricted, circularity follows the same drawback. It seemed to work well at the moment of delineating music either with the same or similar events, as the type that is found in the next section. Strict circularity (that represented by the theory of the eternal return) and broad cyclicity (by Borges, and earlier by Marco Aurelio) are represented whether the logic is circular or helical. Still, that aspect of presentness, so exploited in contemporary Western music defined by particularist moments, and extracted from Oriental music, is impossible to be described in these terms. Finally, no treatment of possible temporal meanings behind these shapes is relevant to logical descriptions and this is the moment precisely when they fall short.

When Marsden decides to use circular systems for analysing representations for music he does it on the basis of conciseness for representation:

By representing the music as circular [referring to the work done by Pachet F., Ramalho G. & Carrive J., 1996, ‘Representing temporal musical objects and reasoning in the MusES system’, *Journal of New Music Research*, 25, pp. 252–75], their analysis algorithm is able to correctly identify the key of a piece when the relation between the end of the sequence and its beginning is crucial, as in the case of Charlie Parker’s *Blues for Alice* [...]. In this case, the same effect could have been achieved by using a simple finite linear representation and writing an algorithm so that it considered relations between the end and the beginning as well as relations within the sequence [...]. However, the complexity of considering relations between the end and the beginning as well as relations within the sequence would have to be added to *every* analysis algorithm to be applied to this music, so there is a considerable advantage in putting the complexity of circularity once and for all into the representation system and allowing algorithms to be designed more simply.<sup>597</sup>

Marsden’s view does not enter into cultural analyses that explain why it is not only for reasons of conciseness, but instead for ideologically grounded reasons that this linear time does not explain all the meanings of temporality in music.

### **5.2.1. Musical Analytical Framework**

Kramer described the cases of (strict) circularity and (broad) cyclicity in music in terms of a extreme he called ‘vertical time’ and in ‘non-linearity’. Presentism in music was not explored as a case by Kramer, although it could be partially analogue with his ‘moment time’.

All music exhibits, according to this author, both linearity and nonlinearity. An unchanging context of textural consistency would be an example of nonlinearity in tonal music. The example he provides in this context are Bach’s Prelude in C Major, from the first volume of *The Well-Tempered Clavier* (1722), and Robert Schumann’s (1810–1856) *Stückchen from The Album of the Young* (1848). However, it is still possible to be surprised by an unexpected change in the pattern; another example is found in Schubert’s song *Gretchen am Spinnrade* (1814).<sup>598</sup>

Apart from textural consistency, formal proportions can be regarded as nonlinear principles. Important studies on proportions in Mozart’s music lead us to conclude that large sectional balances that work according to controlled durations and balances of total durations spent in various tonal areas contribute to create non-linear sense. Kramer’s example is Mozart’s Piano Sonata in E-flat Major, K. 282, 1774.<sup>599</sup>

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<sup>597</sup> Marsden, 2000, p. 27.

<sup>598</sup> Kramer, 1988, pp. 40–41.

<sup>599</sup> See Kramer, p. 42.

Two among many other aspects of nonlinearity in tonal music were discussed. The less tonal the music the less linear it became. This situation obeys the influence of non-Western music and the impact of recording technology. In composers like Debussy and Stravinsky we first encounter true harmonic stasis, segments of musical time that are stationary and have no implication to move ahead. It was an impact on Debussy by the Javanese gamelan orchestra that he heard in 1889 at the Paris Exhibition, when he was looking for an alternative from Wagnerian harmonies. According to Kramer, Debussy's music is the first in Western music that contains extended moments of pure sonority, events appreciated more for themselves than for their role in linear progressions.<sup>600</sup>

In 1900, at the second visit to the Exhibition in Paris, Mahler (1860–1911) also heard and was affected by this music. He later composed, in 1908 *Das Lied von der Erde*, the final song in which an Oriental time is displayed against Western linearity. On the contrary, German composers tried to retain its linear heritage until nonlinear music was further explored, an example of it being the intensified linearity in Schoenberg's music. In America, Charles Ives (1874–1954) felt no allegiance to European linearity, his music had a nondirected time sense.<sup>601</sup>

Since new temporalities appeared, discontinuities became common. Although discontinuity does not necessarily entail nonlinearity, pervasive discontinuity can destroy linear progression. This influence was more technological than sociological. Tape can be spliced; events recorded at different times can be made adjacent. Not only this situation, but the time sense of the inner thought processes influences much twentieth-century music. According to Kramer, art has moved from a logic that reflects the goal-oriented linearity of external life to an irrationality that reflects our personal internal lives. In his opinion, a culture obsessed with time produces art obsessed with time and time obsessed books and articles about art.<sup>602</sup>

Kramer's 'multiply-directed' time is discontinuous time; its discontinuities segment and reorder linear time. The author calls then 'moment time' such time that has no fundamental linearity and is markedly discontinuous. Whereas a multiply-directed linear piece usually has a clear beginning (or several unmistakable beginnings), which may or may not occur at the start of the work, a nonlinear composition in moment time does not really begin. A multiply-directed time can have one or several final cadences, not necessarily at the end of the piece, whereas the moment form starts, rather than begins, and ceases, rather than ends. It seems a series of minimally connected sections or

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<sup>600</sup> Ibid., p. 44.

<sup>601</sup> Kramer, id.

<sup>602</sup> Ibid., pp. 45–46.

moments that form a segment of an eternal continuum. The moments may be related but not connected by transition. Moments are heard more for themselves than for their participation in the progression of the music. Moments are defined more by stasis than process.

The extreme of moment form in which the order of moments does not seem but actually is arbitrary, is mobile form: the composer indicates that the sections of the piece may be put together in any of a number of possible orderings from one performance to the next, perhaps with certain restraints. What such pieces lack in linear logic, they regain in a nonlinear logic of consistency (for example, similarity of texture or timbre). According to Kramer, examples of these extreme moment form called mobile forms are found in Barney Childs' (1926–2000) *Music for Cello* (1964), Earle Brown's (1926–2002) *Available Forms I* (1961), Stockhausen's *Momente* (1961–72), and *Mixtur* (1964).<sup>603</sup> In this study, the extreme of moment form, mobile forms, are going to be considered as branching forms in a potential sense and studied in section 5.3.

Kramer addresses an intermediate possibility: "One might expect to find mobile forms in multiply-directed as well as in moment time, since the linearity in multiply-directed should be susceptible of various reorderings."<sup>604</sup> An example is in Stockhausen's *Zyklus* (1959). Another case of mobile form in multiply-directed time was conceived by the composer as several directional processes initiated in one section, but each of them completed in a different section. Only one of these different sections can immediately follow the initial section in a given performance. These experiments however sound as moment forms because of the fragility of nontonal linearity.

It becomes moment time, if the resulting sections see self-contained, that is, if their goals cannot be unequivocally implied in an atonal idiom. It becomes multiply-directed if either the direction(s) of motion is (are) clear despite the atonality, or else the profiles of beginnings, endings, climaxes, transitions, and so on are conventionalized strongly enough for their functional implications to remain even when they are subjected to apparent reordering.<sup>605</sup>

Early and impure examples of moment time are illustrated by Kramer through Stravinsky's *Symphonies of Wind Instruments* (1920), Oliver Messiaen's (1908–1992) *Oiseaux exotiques*, (1955), the second movement of Anton Webern's (1883–1945) *Symphony* (1928), Lutoslawski's (1913–1994) *String Quartet* (1964), and the third

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<sup>603</sup> Ibid., pp. 46–52.

<sup>604</sup> Ibid., p. 50.

<sup>605</sup> Ibid., p. 51.

movement of Michael Gielen's (b. 1927) string quartet *Un vieux souvenir* (1985). The form of these pieces comes from nonlinear principles of proportion and consistency.

As Lutoslawski's String Quartet, is also going to be treated in the next section on branching time, Kramer's mention of it within his development of moment forms is interpreted here as an incomplete picture of the work.

Kramer acknowledges that proportions become a major determinant of formal coherence, for music in which nonlinearity is a dominant structural force. The author examined proportions in a number of Stravinsky's works, which exhibit moment-time discontinuities. The most complex system of proportional balances is found in Stravinsky's *Agon* (1954–57). There, moment groups, moments, and submoments, represent three distinct hierarchically adjacent levels of structure. Proportional lengths extend beyond moment durations to total lengths of moment groups and to the duration of the entire piece. One can experience it through cumulative listening.

Non-linearity is understood here as inspired in *broad* cyclical time, based on repetition of similar moments as its principal resource.

In the twentieth century, some pieces seem to adopt the requirements for moments (self-containment via stasis or process) as their entire essence:

When the moment becomes the piece, discontinuity disappears in favor of total, possibly unchanging, consistency. [...] Phrases have pervaded *all* Western music, even multiply-directed and moment forms: phrases are the last remnant of linearity. But some new works demonstrate that phrases are not a necessary component in music. The result is a single present [...], a potentially infinite "now" that nonetheless feels like an instant. [...] I call the time sense evoked by such music "vertical".<sup>606</sup>

Kramer explains that lack of phrases is a sufficient but not a necessary condition for vertical time. Iannis Xenakis's (1922–2001) *Bohor I* (1962), lacks internal phrase differentiation and the sense of time that it exhibits is vertical. However, other examples like Larry Austin's (b. 1930) *Caritas* (1969) and Terry Riley's (b. 1935) *A Rainbow in Curved Air* (1969), contain phrases but no sense of hierarchy is distinguished between them, no sense of cadence.

A vertical piece does not begin, merely starts, explains Kramer. It does not build to a climax, does not propose internal expectations, does not build or release tension, and does not end but simply ceases. No event depends on other event; the whole piece is a large event. Once we have entered into a vertical piece we must accept its conditions.

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<sup>606</sup> Ibid., p. 55.

In John Cage's *Variations V* (1965), we approach the infinite ideal where anything can happen without upsetting the verticality of the time structure.

Vertical compositions themselves are not usually unstructured. Rather, their temporal continuum is unstructured. For example, Joel Chadabe's *From the Fourteenth On* (1973), and Cage and Lejaren Hiller's (1924–1994) *HPSCHD* (1969), where the form consists for the most part of unchanging relationships between ever present layers of the dense-sound world.

Listening to a vertical piece is like seeing a sculpture, where we determine for ourselves the pacing of our experience. Like moments in moment time, vertical music may be defined by process as well as stasis. Examples of process music are seen in Steve Reich's (b. 1936) *Come Out* (1966); also Frederic Rzewski's *Les Moutons de Panurge*, (1969). These pieces are constantly in motion, towards a goal or towards infinity.

Vertical music is the most radical of the new temporalities, where nonlinearity predominates. The context of this music allows the listener to make contact with his/her own subjective temporality. 'Vertical time' is understood here as inspired in strict circular time.<sup>607</sup> An example of what is meant here by *strict* circularity, based on repetition of same moments as its principal resource, is Steve Reich's *Come Out*. This type of music was called alternatively pulse music, phase music, beat music, pattern music and finally, minimalism. *Come Out* is the resultant of superposing two tape loops out of synch. A single loop is recorded on both channels. First the loop is in unison with itself. As it begins to go out of phase a slowly increasing reverberation is heard. This gradually passes into a canon or round for two voices, then four voices and finally eight.

The third categorisation introduced by this thesis is inspired in presentism. Particularist music is one obtained from unconnected material, chaotic, but that itself produces moments of stasis by singularity or uniqueness. Here the repetition model is replaced by the resonance of single moments that give the appearance that time has stopped.

An example of this structure is seen in Mauricio Kagel's (1931–2008) *String Quartet I* (1965) for example, described as composed by 'randomly whirring sound particles', a 'conglomeration of sonorous gestures', and 'noises'.

Although philosophically speaking circularity is impossible in its strict sense, there is still certain phenomenological sense of it, which is musical, to be found in Bach, in many world musics, and in avant-garde music.

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<sup>607</sup> Kramer, 1988, pp. 54–57.

Terminological modifications are not only in name but also in the efficacy of its more comprehensive explanation, contemplating philosophical interpretations of time outside music.

### 5.2.2. Cyclical Time in Ginastera's *Norteña*, from *Tres piezas para piano* op. 6 (1940)

As 20th century European and North American music have been analysed enough in previous literature, here examples from Latin American music were chosen. They belong to the Latin American 'nationalist' music repertoire<sup>608</sup> and are given below.



Example 3

In musical Example 3. Alberto Ginastera's 'Norteña' from *Tres piezas para piano*<sup>609</sup> is presented, the 'baguala'<sup>610</sup> inside the musical triptych of Argentinean romantic nationalism. It belongs to Ginastera's second, 'subjective nationalism' period. The musical analysis of 'Norteña' focuses in the ostinato figure, the particular design of the baguala as a more general, inspiring genre and the multileveled structure of the piece as a whole. For this aim, the use of circular time machinery and formalisation of the piece is necessary. Finally, the connection of this music with the circular mythological time conception of the Andeans is concretised.

'Norteña' begins with an ostinato of the I, III and V of Am natural (eolian A) presented in bichords, in inverted fourths, alternating 3/8 and 3/4 meters (it could also

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<sup>608</sup> A tentative insight into temporality as represented in Latin American music of the 20th century is found seminal in Carballo, 1996.

<sup>609</sup> Buenos Aires, Ricordi Americana, 1941. An introduction to Ginastera's work and musical analyses is found in Wallace, David E., *Alberto Ginastera: An Analysis of his Style and Techniques of Composition*, 1964.

<sup>610</sup> 'Baguala' is one of the most ancient folk forms widespread in the region of the Pampas and Northwest of Argentina. Nardi, Carlo L., 'Cinco bagualas' in *Las canciones folklóricas de la Argentina (Antología)*, 1969 (available online).

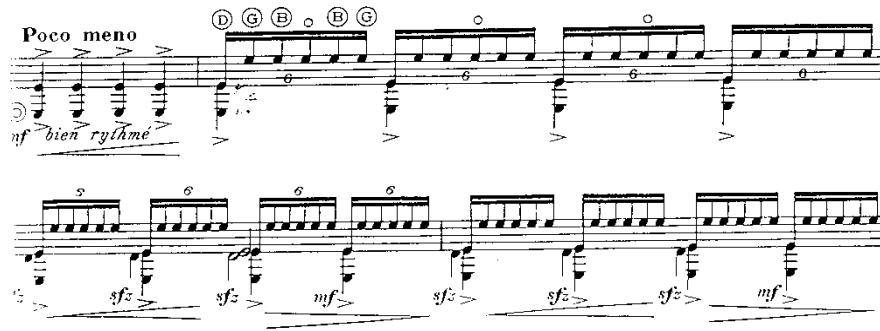
be seen as superposing two pentatonic scales of D and A, creating parallel fifths). Harmonically, the original baguala is structured around the triton: I–III–V; the same remains in Ginastera's recreation, the ostinato pattern reproducing the same scheme: I–III–V. In the original baguala, the repetitive model is present in the pattern performed by the 'caja'.<sup>611</sup> This is accompanied by the lyrics, most of the time improvised between soloist and chorus situated in round. In Ginastera's piano piece, the right hand would take this role, developing a melodic line. Contrary to the a–b–c–b form original of the baguala, the whole piece shows the form A–B–A. A linear melody is exhibited in the central part, belonging to modal mixolidian C (with Bb). The relations established between melody and harmony mattress is thus polymodal (there is a superposition of the ostinato in Am natural or eolian and the melodic line in C mixolidian). The central part of the piece, with full triads in left and right hand working in contrary movement, create a polychordal effect, somewhat resembling the superposition of the different registers in the original sung baguala, creating a whole dissonant result. One interesting role is the sudden arpeggio that interrupts, bridging the main parts of the piece. It is constructed from two chords, G#M and Em. The effect is that of punctuation with impressionistic flavour.

All this shows the multileveled structure of the piece. It does not have one exclusive temporality, in concordance with Kramer's warning on the difficulty of distinguishing a predominant temporal mode in each piece. Polytonality and polychordal effects can be analysed as branching time, the C modal melody as linear, and the ostinato as exhibiting circular time. However, circular time with same events could be advocated as the predominant mode since the reiterative atmosphere that is created has a strong effect in our perception of the piece as a whole, annulling for moments the idea of a true succession. This is also supported by the continuous presence of the round echo of the original baguala throughout the piece, by means of the ostinato device.

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<sup>611</sup> 'Caja', percussion instrument constructed from two drumheads and played by a drumstick, typically used by the singer for accompanying the baguala.





Example 4

Example 4 is Heitor Villa-Lobos' (1887–1959) Study No. 11 for guitar from *Douze Etudes*.<sup>612</sup> This analysis focuses on the middle (*campanella*) section of the piece. It showcases percussive basses performed by the thumb that resemble the sounds of a *berimbau*.<sup>613</sup> The overlapping beginnings and endings, of an afro nature, blur the sense of linearity.<sup>614</sup> This connects with 'macumba' and 'batuque'<sup>615</sup> and with circularity in African music and religion.

Villa-Lobos' piece begins in Em. The form is A–B–A. 'A' presents a linear expressive melody with contrasting, seemingly percussive entrances. The particular transitions from *Lento* to *Piú mosso* resemble African overlapping transitions, typical in rounds with soloist and chorus, where the alternating participation is superimposed, blurring past and future times to provide an effect of circularity.<sup>616</sup> An arpeggio in C resembles the sounds of a harp, suddenly disrupting the movement created by the melody in bichords, and a scale of Db–Eb–F–G is superposed to the bichords (G/B) of C/Em. The pedal in B appears in the context of an E minor natural scale. The B's textural consistency created by the pedal is broken by the melodic line developed in double basses. The multileveled structure appears in this piece as a consequence of the juxtaposition of linear and circular music between the A and B sections. Villa-Lobos also superimposes linear and circular music in the B section (as Ginastera did in

<sup>612</sup> Paris, Max Eschig, 1929.

<sup>613</sup> Single-string percussion instrument of African origin, made from a bow and a pumpkin.

<sup>614</sup> Guestrin Néstor, *La guitarra en la música sudamericana*, available as PDF online book in: <http://sudamer.nestorguestrin.cjb.net/>

<sup>615</sup> African religions coming with slavery to Brazil.

<sup>616</sup> Ekwueme, Laz E. N., "Structural Levels of Rhythm and Form in African Music (with particular Reference to the West Coast)" in *African Music Society Journal*, pp. 32–33.

“Norteña”), but the insistent texture of repetitive notes makes this effect of circularity predominant in the central section.

A point still to be considered here is the election of the examples. Kramer dealt with a continuum from isolated discontinuities in a piece (tonal/non-tonal non-linearity and moment time) to discontinuities that were the scheme for the whole piece (vertical time and total non-linearity). That is, from weaker to stronger cases of circularity. The two above-mentioned examples from the Latin American repertory dealt rather with distinctive circular features (i.e. an ostinato, a *campanella*) that produce just that ‘textural consistency’ that Kramer mentions. They present incipient circularity in music, still not colouring the whole form, as can also be the case with most minimalist music.

Musical examples 3 and 4 both exhibit strict<sup>617</sup> circular time with direction.<sup>618</sup> In addition, the configuration is based on same events (in 3, from the repetition of the same pattern in the ostinato figure and in 4, from the continuous repetition of the E sound, working as pedal on the tonic on an open string). Example 3 may be interpreted *as if* it does not have a lead-in point, timidly coming to surface from a *piano*; example 4 should be considered as having a clear, strong circular beginning through the insistent accented basses in double strings *bien rythmé*.

Strict circularity with similar events, instead of same events, can be found in Ginastera’s *Malambo* op. 7 for piano and Villa-Lobos’ Study no. 1 for guitar. These two cases have a different circular structure from that of the pieces analysed above: they are helix-like (a combination of circularity and linearity) and conceived as spiral-structured music. As an aside, both examples exhibit harmonic progressions accompanying repetitive rhythmical patterns, which create an altogether different sense of cyclicity.

Kramer’s phenomenological perspective defends the idea that circularity can hardly be analysed:

[M]usic cast in vertical time can scarcely be analyzed, in the usual sense of the term, since our normal analytic methods are products of left-hemispheric thinking [...]. It is essentially pointless to explicate a holistic, timeless experience in terms of sequential logic. Thus most discussions of nonteleological music are more descriptive—or prescriptive—than analytic.<sup>619</sup>

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<sup>617</sup> The sense of ‘strict’ in this investigation was already explained and does not imply a circular time *strictly* speaking (which is interpreted logically as an impossible case). Instead, it means that it is more strict in comparison with those cases of ‘broad’ circularity mentioned, where there is a sense of ‘presentness’ created by particular isolated events, but that do not imply any repetition of same neither similar events.

<sup>618</sup> Although in section 5.2.1 strict circular time was applied to Kramer’s vertical time, here the term although applied to different music is maintained for operative reasons.

<sup>619</sup> Kramer, 1988, p. 388.

Again, something different is said in the introduction of van Benthem's book from an ontological point of view, in consideration to the analysis of the continuum:

Apparently a more debatable presupposition of this logical approach is that even a continuum of Time is represented as a point of ('discrete') individuals connected by ('external') relations. Nevertheless, in reality, this analytical decomposition still allows for the most diverse explications of our vague intuitive notions of continuity and discreteness. Indeed, as so often in philosophy one has to be an analyst the more to appreciate the whole.<sup>620</sup>

Finally, neither ontological nor phenomenological views enter into the discussion of the philosophical distinctions between the circular, the cyclical and presentism and their relationship with music intra (and eventually linked to anthropological and social) temporal meaning.

### **5.3. Music and Branching Time**

Branching time has its origin around the problem of the contingent futures in Aristotle<sup>621</sup> or in the image of the best of all possible worlds,<sup>622</sup> just in a sense of a *potential* branching time, i.e. modelling possible options in action and reality of which one must be the outcome. Philosophy however, has presented also ideas of *actual* branching, as found in the proposal of a 'modal realism'.<sup>623</sup> Actual branching time is presented in accordance with ideas about parallel, independent worlds in philosophy, but also in anthropology, literature, and physics.

In his famous essay, "El jardín de senderos que se bifurcan"<sup>624</sup> Borges recreates traditional conceptions of time in philosophy, arriving not only at a literary version of them, but also at an intuition in advance of problems of contemporary physics.

"The Garden..." tells, as a thriller of spies, one of the most brilliant and prolific fictions in the work of J. L. Borges. It begins by presenting the spy Yu Tsun, who works for the German army during the First World War. Pursued by the English, he concocts a risky plan: to kill a man who has the same name as the French city, 'Albert', to inform the Germans of where the British are through the news. After reading the telephone

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<sup>620</sup> Van Benthem, 1983, xii.

<sup>621</sup> *On Interpretation*, Chapter IX.

<sup>622</sup> Leibniz, Gottfried W., *Theodicy: Essays on the Goodness of God, the Freedom on Man and the Origin of Evil* [1710], Part 1: 8, 9 and 10. *The Monadology and other philosophical writings* [1714], paragraphs 53 and 54.

<sup>623</sup> Lewis, David, *On the Plurality of Worlds*, 1986.

<sup>624</sup> Borges, *The Garden of Forking Paths*, 1941.

directory, the spy decides to take the first train to the home of a fellow named Stephen Albert. At the same time, this person is the one who had been recommended to decipher the manuscripts of Yu Tsun's ancestor, Ts'ui Pên. Ts'ui Pên had been an old governor of Yunnan in China, who left instructions to construct a labyrinth and to write a book. However, the novel he had left had apparently made no sense because of its contradictions; for instance, some dead characters were alive in following chapters. In addition, the place of his labyrinth had never been discovered.

Borges creates his image of branching time in this context. Stephen Albert reveals to Yu Tsun that apparently the book and the labyrinth were the same. The contradiction between its chapters shows that it was a labyrinth in time instead of space. In Borges' words:

In contrast to Newton and Schopenhauer, your ancestor did not believe in a uniform, absolute time. He believed in an infinite series of times, in a growing, dizzying net of divergent, convergent and parallel times. This network of times which approached one another, forked, broke off, or were unaware of one another for centuries, embraces *all* possibilities of time. We do not exist in the majority of these times; in some you exist, and not I; in others I, and not you; in others, both of us. In the present one, which a favorable fate has granted me, you have arrived at my house; in another, while crossing the garden, you found me dead; in still another, I utter these same words, but I am a mistake, a ghost.<sup>625</sup>

Borges attempts to recreate a classic problem in philosophy, that of possibility and time. In the history of philosophy, Leibniz had given a solution to the problem of contingency: An event can have many outcomes but only one will occur. For Leibniz, there may be infinite variations but what is real is the world in which we live now, the best of all possible ones.

Borges, on the other hand, postulates the existence of all the alternatives at the same time:

In all fictional works, each time a man is confronted with several alternatives, he chooses one and eliminates the others; in the fiction of Ts'ui Pên, he chooses— simultaneously—all of them. He creates, in this way, diverse futures, diverse times which they also proliferate and fork.<sup>626</sup>

According to a critical study by Zulma Mateos,<sup>627</sup> "The Garden..." is different from other Borgesian fictitious worlds. It does not remain inside fiction but it bursts into reality. This opinion is based on Nicholas Rescher's study on the self-consistency of

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<sup>625</sup> Ibid., pp. 99–100. English translation from *Labyrinths: selected stories and other writings*, New York, New Directions Book, 1964, p. 28.

<sup>626</sup> Borges, 1941.

<sup>627</sup> *La filosofía en la obra de Jorge Luis Borges*, 1998, pp. 79–97.

nature.<sup>628</sup> According to Rescher, this fictional world would be supported by the scientific hypothesis of the many worlds in contemporaneous advanced physics.

Rescher explains that there are two cases of inconsistency: the first implies lack of uniformity, “in some cases x will do A and not B, whereas in other precisely similar cases x will do B and not A”, and the second—the strong sense—is the self-contradiction of logicians, which says that given contradictory statements it is necessary for one or the other to be true or false.

To imagine an inconsistent world is to imagine a world which violates the strong sense of consistency. Rescher arrives at the conclusion that consistency is not a feature of nature but a regulative or conceptual feature, not of reality as such but of our procedures for its conceptualization, according with our conception of it.

The inconsistent world would be perfectly illustrated by Borges’ garden. A “Borges world” is one in which all of the distinct alternatively possible outcomes of a contingent situation are realised; note that here we speak about physical, instead of logical possibility. For Rescher, the world of “The Garden...” is a world in which the limits between possibility and reality disappear, because all possibilities are real. Now, this would be accepted in the case of fiction, but not as a model for describing our real world. However, contemporary quantum physics, precisely, the theory of many worlds—in opposition to the Aristotelian traditional view—presented by Everett in 1957 describes our world as a Borgesian world.

The theory of the multiverse, as found in contemporary physics, is the hypothesis of multiple universes parallel to the one in which we live and it was formulated by Hugh Everett in 1957. Theories of parallel universes can be found under the name of ‘alternative universes’, ‘quantum universes’, ‘parallel worlds’, ‘alternate realities’, or ‘alternative timelines’. The many-worlds interpretation (MWI) is formulated also as *the relative state formulation or theory of the universal wavefunction*.<sup>629</sup>

Atomists had a similar answer to the question of consistency. To the question “why do dogs not have horns?”, they replied that in these cases there is a difference in respect to location in space: dogs do not have horns in this local world, but somewhere within an infinite space there is a world in which dogs have horns. Accordingly, Borges’ saving of consistency is possible, in that he creates a difference of respect in relation to time.

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<sup>628</sup> *The Primacy of Practice. Essays towards a pragmatically Kantian theory of empirical knowledge*, 1973, Ch. V, pp. 88–106.

<sup>629</sup> Vaidman, Lev, “Many-Worlds Interpretation of Quantum Mechanics,” *The Stanford Encyclopedia of Philosophy*.

Borges wrote that the time imagined by Ts'ui Pên was not linear but branching. This would save consistency, because all possibilities are given but in different branches.

This interpretation of time reveals a particular interpretation of the universe. Facts would not be ordered according to a determined *telos*, as the Christian metaphysics believes, but arranged at random. The labyrinth is not constructed by human laws and that is why it is not decipherable. Borges attempts to design only a conjecture for the world. According to Mateos, Borges' attempt is far from being interested in scientific or metaphysical developments. This is the result of thinking of the world as a writing of God, a hieroglyphic for humans. Finally, his pessimist view about our capacity for comprehending the world is saved by the fictional conjecture that everything is ordered at least in the divine plan.<sup>630</sup>

Here, the formal approach to the theory of time in temporal logic could serve to clarify an interpretation. A basic branching system frees two events from the law of connexity (linear system). The law of connexity demands that, given two events, one of them must happen before the other, resulting in a successive linear order of events in time. Without this law two events (or more) can occur at the same time, producing branches. There are two more refined versions of this basic system. The first one states that given several branches only one will happen, resulting at the end in linear time. For the second, one of the branches will materialize but we do not know which. This version seems to be more appropriate for describing Borges' last intuition of the labyrinth conceived by an infinite omniscient mind jointly with the idea that on the contrary we, humans, only can know the present things.

As it was mentioned, in temporal logic there are different variations for the branching system:<sup>631</sup>

*Basic branching system* (CR, Cochiarella, 1966)

A.1. (See the above-mentioned axiom of transitivity). This system is defined on the one hand negatively, as a non-linear system (in the sense of being multi-linear), and on the other hand as a system that possesses an order that allows branches, because it is not prohibited for two different moments to happen at the same time, forming branches. It allows branches to the future as to the past (this last idea being intuitively stranger for us, since the past is commonly considered closed). (See Figure 1.)

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<sup>630</sup> Mateos, 1998, p. 97.

<sup>631</sup> McArthur, 1976, p. 37.

*Branching linear system to the past* ('Kb', Rescher and Urquhart, 1971)

The most important characteristic of this sort of system is the impossibility of the application of the 'mirror image rule', in that past and future are not symmetrical; in fact, the past is interpreted as linear (see the above-mentioned A.3 of linearity to the left), whereas the future is branching. In this system a new formulation of the operators emerges: FA will mean 'It is *possible* that it will be the case that A', and G '*Necessarily* it will be the case that A'. Thus, modal notions of 'possibility' and 'necessity' were incorporated into the definition of the temporal operators. However, the problem with this system is that it is not able to explain why the chosen branch to the future will finally change into a simple line, resulting in a linear system after all.

*Branching modal system to the future* ('Ockhamist', OT, Mc Arthur, 1975)

This third type of branching system makes possible the expression of both a linear temporal future and a branching temporal modal one with the same system of temporal logic. This system, being linear to the past as Kb, interprets also the future 'necessity' and 'possibility' as branching, whereas F and G are kept as linear. To construct a branching model, understanding it as a set of partial linear models would lead to a linear conception of time; however, this system avoids this situation arbitrarily choosing a future branch to be the *prima facie* future branch of the actual moment. As a consequence, one of the future branches from the origin will be the actual, but the question is that one cannot know previously which of them it will be. And this is precisely the situation that leads to the notion of *potential* branching.

Øhrstrøm, unlike other authors appearing in the literature on temporal logic, recognises Borges' "Garden of Forking Paths" story as a pioneer, intuitive work concerning the branching conception. Borges expresses in literary terms what branching systems of temporal logic put into formal language, avoiding obscurities.

Borges new idea about time is represented in a literary figure, and therefore it is no wonder that a number of philosophical and logical problems remain unanswered. In particular, the question about the branching towards the past is conspicuous. How can Borges accept an idea about branching past?<sup>632</sup>

Several interpretations adopt the idea of counterfactual possible futures, among which one is realised. Øhrstrøm thinks Rescher is, for example, against the idea of *branching time* as such, but that he instead defends that of branching *in* time. The controversy of these two ways of understanding branching is nevertheless found in

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<sup>632</sup> Øhrstrøm, 1995, p. 187.

Borges' story without a clear resolution. Borges wrote: "The future already exists"<sup>633</sup> (one option will be forever true in this seeming branching; see above system Kb) and jointly: "Then I reflected that everything happens to a man precisely, precisely *now*. Centuries of centuries and only in the present do things happen"<sup>634</sup> (the present as a decisive point for humans, at which history is open and going to be written). The first picture depicts determinism; the other, free-will in action.

Notice that the above mentioned branching systems support:

1.  $F(1)p \wedge F(1)\sim p$  is true (corresponding to the basic branching system).
2.  $\sim F(1)p \wedge F(1)\sim p$  is true, supposing that the second branch is taken, which negated that an event happened (corresponding to Kb).
3. From the perspective of the Ockhamist model, we would conclude that the expression in point 2. above cannot be known in advance, but only *prima facie*.

Other than the basic branching system CR, Rescher's system Kb and the OT system, there are two extra interpretations. It is the Charles Peirce's (1839–1914) model of the branching, and it says: there is no future yet, just possibilities. So, following the enumeration above, we would have:

4. Neither  $F(1)p$  nor  $F(1)\sim p$  are true, on this interpretation.

Finally a fifth interpretation is from Hirozaku Nishimura. Nishimura considers not only times but *histories* as linear subsets of the set of times. Nishimura's branching time is the union of disjoint histories. Tenses are relative to a history. Here:

5.  $F(1)p$  is true respect H1 (history 1) and  $F(1)\sim p$  is true respect H2 (history 2).

According to Øhrstrøm, Nishimura's model is called 'Leibnizian' in that involves some relation of identity of histories. This, in order to explain the fact that for example H1 and H2 may be identical up to the moment when  $F(1)p$  is true at H1 and false at H2. In order to achieve this identity, future statements are disregarded. This pre-definition of histories is interpreted by Øhrstrøm as a similarity with Leibniz.

Following Mateos' interpretation however, Borges allowed different histories at the same time, in contrast with Leibniz, who conceived one history as the possible, the best possible one (real). In the context of Borges' intuition there is indeed something novel to all these interpretations of branching: they are all happening, Borges says referring to the outcome of Tsui Pen's labyrinthine book: "all possible outcomes occur"<sup>635</sup> and more,

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<sup>633</sup> Borges, 1941, p. 100.

<sup>634</sup> Ibid., p. 88.

<sup>635</sup> Ibid., p. 97



he arrives at the point of cancelling any notion of personal identity by writing: “It seemed to me that the humid garden that surrounded the house was infinitely saturated with invisible persons. Those persons were Albert and I, secret, busy and multiform in other dimensions of time.”<sup>636</sup>

An interesting discussion is raised about the problems of identity, degree of reality, and communication between the several worlds.<sup>637</sup> Regarding the first one, Rescher thinks about a transmundane identity; whereas other authors such as David Lewis speaks in terms of ‘counterparts’ that live in different worlds not accessible to each other.

In sum, there is a difference between the *branching* and the *branched*. One has to do with a *potential* sense, while the other has an *actual* interpretation. One reinforces the idea of the outcome and irrevocable linear past, the other the idea of self-consistent multiple lines or histories. Images from physics, anthropology, and literature can be ordered behind the second interpretation. Psychological and social times offer branched interpretations. One is coincident with the conception of time in philosophy as internal, psychological, and untransferable; the other is found in the more recent idea of social, geographical time, as a time differently perceived according to each culture.

In its turn, Anthony Seeger, in his *Why Suyá Sing, A Musical Anthropology of an Amazonian People*, describes the plural experience of time from a tribe in Matto Grosso, Brazil.

Different individuals or groups contributed different sounds to create a vocal orchestra [...] The unison singing of the adult men, but also the sound of a young solo-shout song singer and the falsetto cries of an old man. In another house a woman was crying over the memory of a dead relative who liked that ceremony especially, and in yet another a group of men was singing. Since thatch walls are not barriers to sound, sounds can be produced simultaneously in a number of different places and still contribute to the whole.<sup>638</sup>

The experience of time as a plurality is, curiously, musically reproduced by the Suyá people. The simultaneity with which these people perform their music is a replica in musical terms of the experience Kramer notes about multiple times in the West.

Alejo Carpentier reveals a peculiar sense of branching in a Latin American conception of time. According to him it is possible to find in Latin America different

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<sup>636</sup> Ibid., p. 100.

<sup>637</sup> Gutiérrez, Edgardo, *Borges y los senderos de la filosofía*, 2001 and Nuño, Juan, *La filosofía en Borges*, 2005.

<sup>638</sup> Seeger, 1987, Ch. ‘Singing as a creative activity’, *Society as an orchestra: the vocal re-creation of social relationships*, p. 74.

temporal strata of human history. The phases, usually successive, coexist in Latin America, they are simultaneous:

In Latin America we have [...] men from the 19th century that live in concrete buildings, buildings that already belong to the 20<sup>th</sup> century. The man of 1975, the futurologist that already lives in 1980 interacts daily, in Mexico, over the Andes, with people that speak languages from before the Conquest. The dominical markets of Juchitán, near Oaxaca, are the same described by Bernal Díaz del Castillo when he spoke about the magnanimous City of Mexico that his eyes contemplated for first time [...] The Latin American of today, lives with an illiterate mass, coexists with a mass that culturally belongs to the European Medieval Era. Some landowners have the mentality of feudalists of the 18<sup>th</sup> century; our great bourgeois—although dressed in a different manner—the one from the Second French Empire.<sup>639</sup>

Manipulation of time has been a constant in Latin American literature. Jorge Luis Borges in “The Garden of Forking Paths” (1941) and later, Julio Cortázar in “Las armas secretas” (1959), have provided images of time that are fruitful for musical comparisons. In both cases the story implies, or the characters get involved in, series of outcomes, all perfectly possible.

According to Carballo, Carpentier alludes to heterogeneous and multiple times:

Latin American music reflects inevitably this pluritemporal condition. [...] The composers of nationalist trend in Latin America concentrate their attention in their own popular cultures in search of raw material to be used for their compositions. As these cultures coexist, situated in different periods of human history—and each period has its own temporal framework—the music created from them reflects these particular temporal dimensions.<sup>640</sup>

The heterogeneity of temporal strata is going to be a starting point for analysing temporality in the *Cantata para América Mágica* op. 27 (1960). In it, we can find polyrhythms and superposition of continuous/discontinuous time, also of the Latin American/European conceptions of time, and superposition of musical languages—for example, pentatonic scales over dodecaphonic series within the same work alluding to the meeting of the two ‘worlds’ or ‘times’, the ancient and the modern, the regional and the classical European languages. The idea of multiple times is charged with a historical sense in Carpentier comparing to the abstract version by Borges.

The anthropologist Edward Hall conceived a seeming but not exactly same phenomenon when describing polychronic cultures.<sup>641</sup> Polychronic cultures can handle different activities simultaneously at the same time. On the contrary, monochronic

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<sup>639</sup> “Problemática del tiempo y el idioma en la moderna novela latinoamericana,” *Obras completas de Alejo Carpentier*, 1983, pp. 214–215. Author’s translation.

<sup>640</sup> Carballo, p. 156. Author’s translation.

<sup>641</sup> Hall, 1959. Ch. 1: ‘The Voices of Time’ and Ch. 9: ‘Time Talks: American Accents’.

cultures do tasks sequentially, one by one. Monochronics tend to think of time as being linear, doing one thing at a time, and not tolerating unpunctuality or disruptions. Polychronic cultures are associated with a sense of time as being cyclical. For them, punctuality is not a virtue, and it seems understandable to be interrupted.

In social psychology, Robert Levine has developed a peculiar notion of *multitemporality* that although having far resonances with the precedent development, interestingly promotes the management of various times ultimately as a key attitude for personal success. Multitemporal societies and persons require a double competence: they must follow both steady as well as quick times. Music also resembles these cases of multiplicity in time.<sup>642</sup>

The branching models can be considered at the moment of approaching special ways of structuring music at macrolevels. A first model can be labelled branching to the right. It is exhibited by music with mobile forms. Stockhausen's *Momente* (1962–64) is an example of it among many others.

The second model is branching to the left. It is the less frequent one, but it is not unusual.<sup>643</sup> Roetti offered three interpretations for understanding this ontology. The philosophical, represented by the Polish logician Jan Łukasiewicz in his article "On Determinism" (1922–23), refers to the idea of those past things not having effects in the present, seeming to belong to the domain of possibility. The second, coming from history, which is related to the rational reconstruction of the possible pasts compatible with the present. This idea is present in literature. Borges wrote that the expiry of memory and the influence of the imagination give place to an alteration of our personal past. In music, this system could apply to the case of several potential events that finally end establishing one of the possible outcomes.

The third situation allows branching in between a single beginning and a single outcome. Lutoslawski's *String Quartet* (1964), specifically its passages of unison, interpreted along the branched performance of each instrumentalist playing without coordinating with each other, could be read through this model.

The fourth possibility involves branches fanning out to the past and to the future. Ginastera's *Cantata*, analysed below, can be considered a musical expression of an actual parallel branching time. In Figure 1, the basic branching system CR

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<sup>642</sup> Levine, Robert, *A Geography of Time: the temporal misadventures of a social psychologist, or how every culture keeps time just a little bit different*, 1997.

<sup>643</sup> Roetti, 1984, pp. 70–71.

(‘Cochiarella’s Tense Logic system’) shows this model. Finally, music shows diverse arrangements of the branching.<sup>644</sup>

The last case of branching fanning out to the left and to the future is interpreted as having firstly its foundation in Borges’ story “The Garden...”, then proposed in contemporary physics and finally, read through some anthropological and psychological (analogical) versions. Alan Marsden omits all these precedents, mentioning only a later story, John Fowles’ “The French Lieutenant’s Woman”, whose quotation appears also in Kramer’s book.<sup>645</sup> None of them extracted the philosophical consequences in order to enrich with theoretical approaches of branching time the field of musical analysis.

According to Marsden, it is easier to interpret these above-mentioned cases as branching instead of linear with disjunction because conjunctions (given among the branches in branching time) are readable by computers. However, for logical proceeding, linearity with disjunction representations uses fewer logical constants.<sup>646</sup> It is, then, hard to decide on the basis of simplicity (economy in the representation) for the branching model.

More important is the consideration that not all types of branches at branching representations are ‘real’ in Marsden’s account. “The performer chooses which version of an *ossia* section to perform, and the notes of the other version simply do not exist in the performance.”<sup>647</sup> Thus, linearity plus disjunction would be a more sensitive model for expressing these cases. However, things are more complicated from the point of view of computer processing:

[...R]epresentation in this manner [linear with disjunction] does not rule out the possibility of a performer playing both versions of an *ossia* at once. To do so would require adding more clauses to the representation explicitly preventing this, and so considerably complicate the representation. It is therefore in situations where this must be prevented or where one wishes to reason about the events in alternative sequences together that a representation in branching time has a clear advantage.<sup>648</sup>

The branching time logic applied to music representation mentioned in Marsden do not contemplate ideas growing in philosophy, literature, physics, anthropology, and social psychology; for Kramer this temporality was associated mainly to the development of technology applied to music.

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<sup>644</sup> Extended version in Calleja, 2005.

<sup>645</sup> London, Cape, 1969, quotation in Marsden, 2000, p. 28. See also Kramer, 1988, p. 13.

<sup>646</sup> Marsden, 2000, pp. 29–30.

<sup>647</sup> *Ibid.*, p. 30.

<sup>648</sup> *Ibid.*, p. 31.

In the case of branching, *when* exactly all this had repercussions for music would be hard to assure, but hypothetically some first works could be mentioned. The hypothesis on the transition from linearity to branching time is not found explicitly in musicological literature, contrary as it was found from circularity (founded in Christian eternity) to linearity in Berger, and from linearity to non-linearity (founded in modern experiences with time and exchange with Oriental cultures) in Kramer.

Branching time in music is configured on the basis of a special sort of superpositions: of ‘plucking’ over ‘smooth’ texture, of different languages such as pentatonic scales over atonal scales, or of the music of the Andes over the language of contemporary European art music, and finally many internal times working together without a precise common *tempo*. These cases are all musical expressions of this last temporal mode.

The actual branched is uncovered through the whole organisation of a piece of music conceived with parallel lines of heterogeneous material, for example, in Alois Zimmermann’s *Requiem*, a multitextual work, or in Elliot Carter’s String Quartet No. 3, which presents temporal modulation along superposed, character-contrasting levels.

### **5.3.1. Musical Analytical Framework**

The idea of time as branching off into different directions in relation to music is already present in Kramer. In his opinion, it is connected to our contemporary Western understanding of temporality, typically represented in computer-like thinking, where it is usual to “branch off, return to earlier states, and loop”.<sup>649</sup>

Kramer called but a similar situation ‘multiply-directed’ linearity.<sup>650</sup> He explains the fact that there are pieces whose direction of motion is frequently interrupted by discontinuities, which make the music go so often to unexpected places that goal-directed linearity, though still a potent structural force seems reordered.

However, what in this thesis is understood by a branching model of composition is—in one of its senses—closer to what Kramer calls as the extreme of moment time.<sup>651</sup> Mobile forms, in which the order of moments is arbitrary, represent this extreme situation. Here the composer indicates that the sections of the piece may be put together

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<sup>649</sup> Kramer, 1988, pp. 13–14.

<sup>650</sup> *Ibid.*, pp. 46–49.

<sup>651</sup> The author calls ‘moment time’ such time that has not fundamental linearity and is markedly discontinuous. *Ibid.* pp. 50–52.

in any of a number of possible orderings from one performance to the next, perhaps with certain restraints. An example of this procedure is in Stockhausen's *Momente*, 1961–72.

A 'moment', according to Stockhausen, is a segment of music determined by constant characteristics of register, dynamic, tempo, and so on; a transition accomplished between moments can be slow or abrupt.<sup>652</sup> The moment-forming is the act of composing a certain degree of change that can vary from zero to a defined maximum. In the work *Momente*, there are three principal groups of moments: the M-moments (melodic, heterophonic, represented by a speaking soprano and brass instruments). Then there is a second group: the K-moments (from the German word *Klang*: sound quality), characterised by timbre and homophony and represented by male voices and percussion. Finally, the third group is represented by the D-moments (from the German *Dauer*: duration), that are characterized by durations, silence, and polyphony, and represented by singing female voices and electric organs. In addition there are moments further from these pure centers, which share more or less elements with the others. For instance, an M (k) moment is an M-moment with a precise component of K.

What defines a mobile form is the idea of controlled randomness (mobility of the form) that the work presents. Mobility functions as follow: the K-moments must always be at the center of the work in the performance. However, the conductor may decide on the order of the other moments for a particular performance. This means that D and M-moments, which are on either side of K, can be interchanged. The same occurs within each subsequent group raised from each branch. This procedure makes the work like a mobile, a large number of possibilities of combining these musical moments into a fixed version for a particular performance.

Branching systems can contribute to clarify this kind of procedure. Here it is necessary to translate from individual variables (x, y) into 'moments'. Then, a large variety of orders in the disposition of the moments appear at the same time in different branches to the performers as possibilities (for instance at the beginning: M–K–D or D–K–M). What 'possibility' means should be analysed more in detail. By the potential type of branching system is known that past performers only have a simple line as a resultant of their selections, although the future affords several possibilities. For instance, in the Europe Version of *Momente* recorded in 1972, the actualised version was D–K–M, and in each moment group K–D–M, M–K–D, and D–M–K respectively.

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<sup>652</sup> Stockhausen, Karl, *Stockhausen on Music*, Robin Maconie (comp.), *Lectures and Interviews*, 1989, pp. 63–75, "Moment-forming and Momente".

Tarasti's ideas on counterfactuality in composition described in the paradigm of all choices 'pTT(q) r [q, r, s]', that means, 'if after p, q is expected but r occurs and after p: q, r or s is possible', would be situated in the basic case of branching time. At the moment of structuring a composition, some events are regarded as still not having any consequences, so in the past appearing as mere possibilities, whereas the future is open to possible options as well (although not unlimited).

The most suitable interpretation for Stockhausen's above-mentioned *Momente*, as well as for Boulez's *Third Sonata* for piano (1955) inspired in the same procedures, is the second type of branching time (Kb system). Closer to Leibniz's conception of possibility, which emphasises one possibility as real, these mobile works are finally perceived as simple lines.

The second type of branching system, by which we can express the idea of branching becoming a line at the end is well applied to mobile forms (and in popular music to traditional jazz, also to Hindu classical music, non-spontaneous improvisation, where paths are pre-indicated). A greater sense of uncertainty was expressed by the third branching system OT, selecting a *prima facie* branch to be the actual future branch. The uncertainty of not knowing what branch exactly will happen can be applied to counterfactual reasoning modelling of the process of composition and also to free jazz (total) improvisation.

Finally, music working with actual parallel or branched times is much closer to Borgesian branching time and expressible through the basic branching system CR. (See Figure 1). Examples of this are Lutoslawski's String Quartet, Elliot Carter's String Quartet no. 3, or Zimmermann's *Requiem*.

To conclude, the branching structure of time can be applied to the study of musical time on several axes: the level of composition (counterfactual process), the level of free improvisation, written music with controlled random or mobile forms (also non-spontaneous traditional jazz improvisation), and finally, the level of the musical form inspired in parallel worlds fully written.

The first case of Elliot Carter's (1908–2012) music is special in that it questions the division subjective/objective time in music, expanding the idea of 'beat' or 'pulse' from that of a simple common denominator, to which a limited set of proportionally related durations must conform, to that of a continuum of variable yet interconnected proportions, allowing for a virtually limitless range of durational fluctuations (a technique called 'metrical modulation' or modulation of the *tempo*).

Carter fixes parallel times with a rigorous writing in the score, contrasting with Lutoslawski, whose writing is free. However, Lutoslawski's branching time in his String

Quartet (1964) is much more perceptible than the chaotic effect that results from Carter's quartet. At this point, we can divide the formal level (the conceptual idea of the work), or score level, and the phenomenological (the perceptible result).

Elliot Carter's String Quartet no. 3 has a two-dimensional structure. Even it presents physical separation of the duos, positioned at different places in the space and stereophonic sound in case of recordings. The idea of opposition between parts is carried to its extreme, treating each instrument as a separate entity but pairing them into duos, which continually present contrasting material—movements—throughout the course of the composition. Among its six movements, Duo II (2<sup>nd</sup> violin and viola) is characterized by rhythmic regularity (*tempo giusto*) while the four movements of Duo I are presented in a freer *tempo rubato*. The two duos hardly ever play together rhythmically and usually confront one another in highly complex polyrhythms and different *tempi*. According to Carter, there are actually two separate sets of pieces from beginning to end. In addition, he assigns differences in speed, intervals, dynamics, phrasing, bowing, registers and expression. Another of Carter's resources in this work is to introduce eight solo movements, firstly to lighten the texture, but secondly to aid in the recognition of the opposite characters. The *giusto meccanico* of Duo II and the *giocososo* of Duo I superposed, provide the most colourful episode in the piece in mm 90–96. There are frequent superpositions of the more rapid movements, such as *scorrevoles*, *leggerissimo*, and the slow, quiet movements, such as *largo tranquillo* or *andante espressivo*.

In the second case of branched music, Witold Lutoslawski's (1913–1994) String Quartet (1964), the four instruments are written as if they were playing alone, a reaction against the image of the dialogic music the string quartet represent par excellence. Generally, the voices go their own ways, though frequent *ostinatos* reduce the complication this might imply.

The third case is in Bernd-Alois Zimmermann (1918–70)'s *Requiem for a young poet* (1967–69). A work that has language as center of the work—for speaker, soprano, basso, 3 choirs, electric sounds, orchestra, jazz-combo, and organ. Here texts are used for contrasting. The distinctive diversity of material lives in various layers of times and events. He wanted to represent time in all aspects: cultural, historical, linguistic, and intellectual situation of Europe during the period between 1920 and 1970. Resonances of this type of branched times is found in Ginastera's *Cantata*. The piece has five movements: Prolog; Requiem I; Requiem II & Ricercar; Rappresentazione, Elegia, Tratto & Lamento; and Dona nobis pacem.



The texts used are: I. from Christian liturgy (requiem-liturgy, revelation of John, book of Salomo); II. literary texts (Joyce, Ezra Pound, W.Majakowskij, Sandor Weöres and others); III. philosophical texts (Wittgenstein, Mao Tse Tung, constitution); and finally historical recordings of speeches (Dubček, Pope John XXIII, Goebbels, Hitler, Chamberlain, obituary of Sergej Jessenin by Majakowskij).

Polytemporality is not exclusive of Western music, or of contemporary academic music. Heterophonic music of Bali (*gamelan*) is an example.<sup>653</sup> It exhibits a temporal flexibility that can be recognised as a case of branching time music. In gamelan music, some instruments participate through variations along a common pulse, and there are melodies of large scale proportions which develop freely over this mattress of common pulsation.

The polyphonic music of the Renaissance also provides examples of branching music. Motets and madrigals without the exact measured notation developed later, can be recognised as another antecedent example for branching time. Classic and Romantic examples were provided by Rowell.<sup>654</sup>

Branching time is not exclusively music with lines with same notes at different simultaneous *tempi*,<sup>655</sup> it is generally music founded in temporal multiplicity. 'Polytempo', 'multitempo', 'metametrics', 'micropolyphony' or 'temporal dissonance' are all presenting branching time. Also other resources used are 'metrical modulation' (Elliot Carter) and 'non-harmonic polyphony' or 'aleatoric counterpoint' (Lutoslawski).

### **5.3.2. Paralell Times in Ginastera's *Cantata para América Mágica* op. 27 (1960), I- 'Preludio y canto a la aurora' and VI- 'Canto de la profecía'**

Composed in 1960, the *Cantata* is one of the first works of Ginastera's dodecaphonic period. It was premiered at the Second Interamerican Music Festival in Washington, D.C., in 1961. It is a large work for dramatic soprano, percussion, orchestra, and two pianos. It mixes folklore elements, indigenous instruments and pre-Columbian-inspired

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<sup>653</sup> Lindsay, Jennifer, *Javanese Gamelan*, 1992.

<sup>654</sup> Rowell, 1983, p. 264, note 72.

<sup>655</sup> Greschak, John, <http://polytempomusic.blogspot.fi/2007/09/word-polytempo.html>

I am indebted for this distinction to Natali, Sergio, Master Thesis ' *El politempo en la música del s. XX. Problemas de notación y ejecución*, Department of Musicology, University of Helsinki, (in process).

poems by Mercedes de Toro,<sup>656</sup> Ginastera's first wife, with thematic and structural devices common to the Second Viennese School, particularly, multiserialism, politonality, and quarter tones.

The *Cantata* belongs to the last neoexpressionist period of Ginastera's output, which was famously described by Pola Suárez Urtubey:

It is hardly possible to find reminiscences of rhythmic or melodic cells from folk music. Neither it is to find those symbolic elements that appear in the second period. However, there are constants that continue to feed the style: strong and obsessive rhythms, contemplative adagios, magic sonorities, mysteriousness. It is an 'idée fixe'.<sup>657</sup>

The work was a success in North America as well as in his own country. Irving Lowen from 'The Evening Star' (May 1, 1961) wrote:

Because it is music that undoubtedly belongs to the Americas. It is bold, free, magnificent, a music written by a man that is proud of his heritage and that is sufficiently dared for walking by his own and lonely path.<sup>658</sup>

In Buenos Aires, its reception had the same connotations; according to Suárez Urtubey, Leopoldo Hurtado from *La Prensa*, wrote in 29<sup>th</sup> October, 1961 that the novel techniques explored by Ginastera helped him to adventure into the pre-Columbian América. Hurtado believed that the language used by the composer was based on one of the principal elements of the native animistic expression: rhythm, and that the avoidance of common moulds of Western music such as melody, harmony, counterpoint, and regular, symmetric forms, collaborated in this sense.

On the other hand, the use of multiserialism, pitch, intensity, timbre, sonorous densities, does not preclude from a language that is powerfully communicative and exciting. The atomization and submission under abstract structures, diluent and undifferentiated, proper of the multiserialists, is not a feature in Ginastera, according to Suárez Urtubey.<sup>659</sup>

The six movements that constitute the piece describe the epic drama by which a civilization passed from its outstanding magnificence to its unfortunate destruction. Gods' invocation, romance, battle, defeat, and apocalyptic prophecy are the topic description of each poem. The exception is the fourth movement, which is a purely

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<sup>656</sup> The texts are adaptations of collected drafts found by Christian priests from the Inca, Maya, and Aztec cultures of the time previous to colonization. Pola Suárez Urtubey, 1972, p. 61. The author also has an article particularly dedicated to the work: Pola Suarez Urtubey, *Revista musical chilena*, "La 'Cantata para América Mágica' de Alberto Ginastera", vol. 17, N. 84, 1963.

<sup>657</sup> *Ibid.*, p. 58. Author's translation.

<sup>658</sup> *Ibid.*, p. 61.

<sup>659</sup> *Ibid.*, p. 62.

instrumental interlude, a fleet and shimmering toccata that gradually adds instruments within a constant *pianissimo* range, reaching a climax on a tremolo, 12-note chord, and receding in reverse order. In the vocal movements, the voice is characterised by an enervating dramatism and constitutes the beginning of Ginastera's experimentation for his following operas. Intervals of 11<sup>th</sup>, high-pitched pedals, and abrupt starts are some of the resources comfortably used by the composer.

Suárez Urtubey mentions an aspect that becomes substantial from the Latin American perspective:

[T]hose proceedings, although modern in the vocal writing of a contemporary composer, are inseparable of the singing of infinity of non-western cultures, among them, the Amerindians. Think about our *bagualas* (tritone song book), that, sung with *kenko* (something like singing with swing) uses all kinds of vocal devices such as *portamentos* or quick inflections from a sound to the other of the scale, particular timbre, etc. Having brought the West to one of its climaxes, it begins to drink from the sources of other more spontaneous cultures. Music is not at the margins. That is why a symbiosis of modern proceedings with the stylistic authenticity of the indigenous singing can be found in Ginastera.<sup>660</sup>

This double aspect, the modern and the ancestral, become essential in the interpretation of the philosophical idea behind, that of parallel worlds or times in terms of mixture of historical moments, without leaving aside those 'internal' aspects that were introduced as peculiar of Ginastera's treatment of time: at moments concise, kinetic, 'with bravery'; at moments delicate, transparent, poetic.

There is a remarkable aspect that brings a variety of possibilities and is of special interest in the study of temporality: the superposition of rhythmic formulae that prompt us to randomness in the last movement.

Beside passages of rational rhythm, there is a predominance of multirhythm by the simultaneous use of irrational values. Even inside irrational values, new formulae, also irrational, are incrustated, as in the passages at the end where the performance arrives to randomness.<sup>661</sup>

Michelle Tabor's helps substantially in the development of an interpretation of parallel although not fused, glued, historic times in the cantata. Indeed, Tabor feeds the thesis of the three different and demarcated stages in this third period of Ginastera's work.<sup>662</sup> A first one which is 'pure' or abstract; a second one, to which the cantata belongs, is a stage of mixture and superposition although still not synthetic in its proper sense; and the last, his synthetic stage.

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<sup>660</sup> Ibid., p. 64.

<sup>661</sup> Ibid., p. 62.

<sup>662</sup> Tabor, Michelle, "Alberto Ginastera's Late Instrumental Style," *Latin American Music Review*, Spring/Summer 1994.

Tabor concentrates in the least studied period in the work of Alberto Ginastera and provides a dissection of the total ‘neoexpressionist’ phase, which begins in 1958 with his String Quartet no. 2, op. 26 and finishes in 1982 with Sonata no. 3, op. 55, into three stages:

Contrary to existing evaluations, the analyses presented in this article demonstrate that three directions or trends are evident within the late works and that two of those directions include nationalistic elements [...].

One direction explored by Ginastera after 1957 comprises a group of compositions that are abstract, contain no references to nationalism, and exhibit few traces of traditional tonality [...].

The second direction comprises four works that have nationalistic titles: *Cantata para América Mágica* (1960), [...] *Puneña N1* (1973) [...]; *Popol Vuh, The Creation of the Maya World* (1975–83) [...]; and *Puneña N 2* (1976) [...]. The compositions reveal a unique approach to the ideals of nationalism evoked in contemporary idiom. While preserving the spirit of and emphasis on nationalism, the framework of traditional tonality, supporting traditional melodies and rhythms disappears. The compositions within this trend, therefore, constitute a *synthesis* of nationalism with the techniques of the avant-garde.

The third direction within Ginastera’s late period encompasses such works as the Sonata for guitar (1976), Sonata for cello and piano (1979), and the second and third Sonatas for piano (1981 and 1982, respectively) [...]. [T] his group of works presents perhaps the *best examples* of the synthesis of the avant-garde with tradition, together with the incorporation of nationalist elements.<sup>663</sup>

To sum up, there are various strata from which the idea of parallel times can be extracted: modern proceedings superposed with the style of indigenous chants, as described by Suárez Urtubey; complex textures; rhythmic superposition of rational over irrational and of irrational over irrational formulae; and timbral superpositions. As we will soon see, a more detailed analysis of the first movement brings concrete examples of the superpositions in terms of rhythms, vocal resources, and timbres.

The first movement, *Prelude and Song of Dawn* is a chant of expectation and angst.<sup>664</sup> The form of this first movement is ternary, introducing the voice at the end of the first macroformal unit, until the end of the piece:

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<sup>663</sup> Ibid., pp. 3–5. Italics mine. ‘Synthesis’ is interpreted by the author however as not fully developed, in the sense of parallel languages or superposition still, and what is referred as the ‘best example’ of synthesis is the last synthetic period properly.

<sup>664</sup> See Appendix.

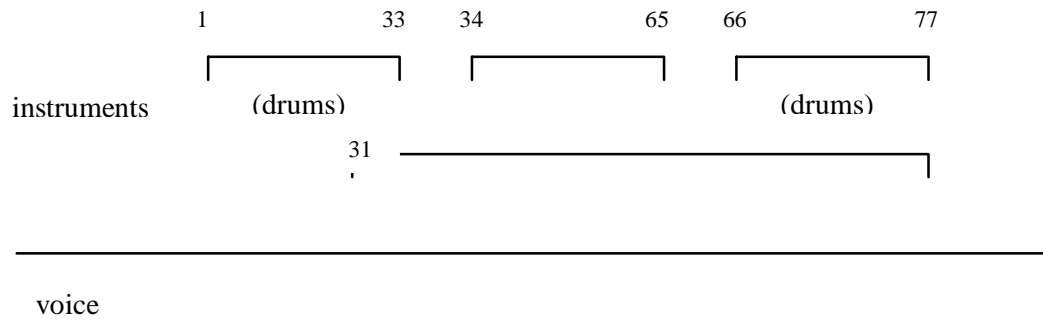


Figure 8

A first aspect of parallelism is found in the prevalence of rhythmic simultaneities, or complex textures created from the superposition of various rhythms and timbres. Multirhythm is caused by the superposition of irrational values. 16<sup>th</sup> notes' septuplets on the kettledrums over quintuplets on the bass drum I, nontuplets on bass drum II, and triplets on the bongos (I, m. 19).

There are diverse punctual rhythmical pulses in the drums (*parches*), with subdivision of the pulse in different numbers, this over repeated pulsation with variable pulse made by xilophone, marimba, glockenspiel and pianos, finally over quick surrounding ostinatos made by celesta and pianos (pianos having a double function in texture). (I, mm. 65–66, Example 5).

65

Sopr. *tutta la forza*  
*ba*  
*sol, cre-a-do-ra de la luz!*  
*sun, cre-a-tor of the light!*

I. Tpni. *f* *fff*

II. Tpni. *f* *fff*

I. Cassa *fff*

II. Cassa *fff*

6 T.W. *fff*

3 Ptti. *fff*

3 T-T. *fff*

I. C.pae. *fff*

II. G.C. *fff*

III. 2 Ptti. *fff*

65

Xil. *fff*

Marim. *fff*

Glock. *fff*

Gel. *fff*

Pno. I *fff sempre molto accentuato*  
*sempre col ped.*

Pno. II *fff sempre molto accentuato*  
*sempre col ped.*

Example 5

A second parallelism is the use of the voice. There is a simultaneity between serial organization, in a chromatic-atonal context (first original hexacord: F # - G - D # - C - B - F, and second hexacord, by retrogradation at an interval of an ascending major

second: Ab – D – Eb– E – Bb– A) and the use of *acciacaturas*, typical of the inflections of aboriginal music (I, mm. 49–63, Example 6).

The image shows a musical score for Example 6, which includes a vocal line and a large percussion ensemble. The vocal line is for Soprano (Sopr.) and three parts (3 Ptti.). The lyrics are in Portuguese: "pa-z! iOh tú, Hura-cân, Chi pi - Ca.cu.lhá, Ra xa - Ca.cu.lhá, Chi - peace! O, thou, Hu-ra - cân, Chi pi - Ca - cu - lhá, Ra xa - Ca - cu - lhá, Chi -". The score includes parts for 3 Ptti., T.T. (Timpani), I. C.pno (I. Cymbal), Xil. (Xylophone), Marin. (Maracas), Glock. (Glockenspiel), Cel. (Cello), Pno. I (Piano I), and Pno. II (Piano II). The score is marked with dynamics such as *f*, *mf*, and *sempre sf*. The tempo is marked *f sempre cresc.* and the number 50 is indicated. The score is written in a complex, multi-measure format with various rhythmic values and articulations.

Example 6

Another superposition worth mentioning is Ginastera's use of serial methods including ostinatos and arpeggios at the end, which provide a feeling of a tonal center.

Timbral simultaneities are obtained by the superposition of strata of the different instruments used. Ginastera includes a group of Latin American percussion instruments: *cajas*, *tambores*, *chocalho*, *sistro*, and *güiro*. On the other hand, he uses pianos in marginal functions in comparison with traditional ones, as percussive instrument or for a transient function. In general, the wide range of the percussion, goes from two grand pianos to a pair of rocks struck together. (Figure 9).

ORCHESTRA





<b>I - Kettledrums I</b>	} 3 Kettledrums		
<b>II - Kettledrums II</b>	{ Small kettledrum Pedal kettledrum Lower kettledrum		
<b>III - Drums I</b> <sup>1)</sup> also: Drums II (N° IV)	{ Small Indian-drum Medium Indian-drum Large Indian-drum	} These six instruments must have a pitch relationship in order to establish a series from the lower (Bass-drum) to the higher (small Indian-drum)	
<b>IV - Drums II</b> also: Small metallic "sistrum" <sup>2)</sup> N° IV Kettledrums IV (N° V)	{ Side-drum (without snares) Tenor-drum Bass-drum		
<b>V - 6 Temple - woods of different sizes</b> <sup>3)</sup> (6 T.W.)	{		These six instruments of mexican (Teponatle) or african type must have a pitch relationship between the lower one and another fairly high.
<b>VI - 3 Suspended cymbals of different sizes</b> also: 2 Clashing cymbals (N° VI) 2 Cow-bells of different sizes (N° VI)	{ Small Medium Large		} Between the 3 suspended cymbals and 3 tam-tam a relationship of pitch must be established going from the deep lower pitch to the higher pitch (small cymbal)
<b>VII - 3 Tam-tam of different sizes</b>	{ Small Medium Large		
<b>VIII - Percussion I</b>	{	2 Pairs of "antique cymbals" of diferent sizes (Crot.) Small suspended cymbal (P. p.) 2 Bongós (Bong.) Chimes (Cpne.) Small-triangle (Tg. p.) "Reco-reco" <sup>4)</sup> (R. R.) Small high claves <sup>5)</sup> Small-maracas (mar. picc.) Chocalho <sup>6)</sup> (Choc.)	
<b>IX - Percussion II</b> also: Kettledrum III (N° V-VI)	{	Güiro <sup>7)</sup> (Gra.) Triangle (Tg.) Bass-drum, very low (G. C.) Low claves <sup>8)</sup>	
<b>X - Percussion III</b>	{	2 Maracas small-medium <sup>9)</sup> (Mar.) 2 Clashing cymbals (2 Ptti.) 2 "Sistrums" (I metallic; II of sea-shells) <sup>10)</sup> (Stri.) Small Triangle (Tg. p.) Sleig Bells (Sngl.) Pair of Stones <sup>11)</sup> (Pietro)	
<b>XI - Large Xilophone:</b>			
<b>XII - Marimba:</b>			
<b>XIII - Glockenspiel:</b>			
<b>XIV - Celesta:</b>			
<b>XV - Piano I:</b> (Large concert piano without a cover)			
<b>XVI - Piano II:</b> Large concert piano without a covert			

Figure 9

This section has concentrated on pointing out these resources in the first movement of the cantata but similar situations can be detected in the other movements. For



example, in the sixth movement, Ginastera returns to ‘integral polirhythm’. Integral polyrhythm is the “textural type where simultaneity coexists of various different rhythmic lines, presenting a macro o micro unity of pulsation in common.”<sup>665</sup> Still, in this last movement there is a passage of free rhythm, where the rational divisions seem to disappear (VI, 110–114, Example 7).<sup>666</sup>

Mariano Etkin calls the musical resource, employed since Ives and later exploited by composers such as Feldman and Cage, “rhythm free of pulsation”.<sup>667</sup> The destabilization obtained by Ginastera, of any certain pulse (firstly by multirhythm in movement I and now by irrational aleatoric procedures) arrives at its climax in movement VI. Etkin interprets this way of using rhythm as *pure duration*, emancipated of any foreseeable ‘counting’.

Is it perhaps here a parallel between this type of non-pulse rhythm that yields, without doubts, to think about the type of rhythm of serialist and punctillist trends of the European music, and the strong pulse rhythm that could be associated with an important part of ethnic music of Latin America?<sup>668</sup>

Starting at m. 128, movement VI, a pulse rhythm is imposed. Grela suggests there is a superposition in this last movement of ornamental discontinuous rhythm and pulse rhythm, as happened at the beginning of the work.

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<sup>665</sup> Grela, 2001, p. 92.

<sup>666</sup> Suárez Urtubey, 1963, p. 29.

<sup>667</sup> “Sobre el contar y la notación en Ives y Feldman”, *Revista del Instituto Superior de Música*, 2002.

<sup>668</sup> Grela, 2001, p. 96.

The image displays a musical score for Example 7, consisting of two systems of staves. The first system begins at measure 110 and includes a vocal line with lyrics "ce" and "venth" and a piano accompaniment. The piano part features a prominent triplet of eighth notes marked "3-2" and a dynamic marking of "ff sempre cresc.". The second system continues the piano accompaniment with various rhythmic patterns, including more triplet markings and a "3-2" marking. The score is written in a standard musical notation style with treble and bass clefs.

Example 7

Modalities of time as categorised here do not function as sharp or pure species but working amid the different temporalities that a same work can exhibit. In reference to the example analysed at the end, the VI movement of the *Cantata* shows obstinate,

repetitive rhythms (as it happens with Tam-Tam, mm. 1–127) however, it is hardly a substantial resource for the overall interpretation of the movement as exhibiting the main characteristics of a branched time. In the same vein, the stability obtained by the soprano from the use of acacciaturas plus a reference point (different in effect from the angst and expectancy atmosphere of the beginning), creates the sensation of lineal discourse. However, this direction in the voice does not private the whole message as having parallel times, significantly because it is the unique movement of the whole piece where random parts in rhythm are superposed.

It is time to emphasise the more general factors of cultural identity, integration, and coexistence on which these parallel times reflect upon. In fact, Ginastera composes this work in an atmosphere different from the one surrounding him during the earlier, ‘subjective’ period of compositions. The earlier ‘nationalist’ perspective becomes a broader, ‘continental’ one.

The Cantata para América Mágica presents as a type of work in which the composer plays permanently with a search of ‘integration’ (or, at least ‘coexistence’) between certain factors that refer directly to the contributions of the European musical culture of the 1950s and others that go back to the ethnic musics of Latin America (particularly those with aboriginal roots).<sup>669</sup>

Grela describes this situation as ‘dynamic tension’. It is “the resultant situation by which the interaction between multidirectional processes work simultaneously in the interior of a sonorous form.”<sup>670</sup> This *interaction* is the one which receives here the interpretation of multiple or parallel times in music.

[I] believe that a work as this becomes highly significant of what our Latin American reality is in the sense of culture, which is based on mixture, diversity, coexistence of situations that have nothing to do with utopic purisms. Meanwhile, if we do not become aware of this situation and continue feeling either an extension of the European culture, of an aboriginal Latin-Americanism, or of the typical representatives of the ‘globalized’ world, we will continue to grope, trying to be something that we deeply know we are not.<sup>671</sup>

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<sup>669</sup> Ibid., pp. 87–88.

<sup>670</sup> In “La consideración de las tendencias múltiples (asociativas-disociativas) en el análisis musical”, *La música en el tiempo*, 1992.

<sup>671</sup> Grela, 2001, p. 98.

## CONCLUSIONS

The relevance of discussing the topic of time and music is underlined by the double fact that time is a central concept we have to deal with in our practical and scientific worlds and on the other hand, music is such a vital company for our everyday lives that we can hardly obviate a philosophical reflection about its value and its meaning. From this point of view, music not only teaches us how to manage with time in terms of counting, or proportions, but in the further sense of reflecting with sounds about time, and in this sense becoming a source of knowledge.

The existence of a time of music was conceived neither as an exclusive ‘musical time’ as totally separate time species, nor ‘Time’ in music, in an abstract de-subjectified way. A co-operative, hybrid view of the problem is defended, with the accent in its aesthetic dimension. The fusion or hybridization of rival theories yields to a deeper question about the result of that mix. Is it a more comprehensive theory than either the phenomenological or the ontological taken separately, or it amplifies, in the sense of saying new things? One important sense behind any philosophical debate is that philosophy orders partial knowledge; philosophy cannot be reduced to close boundaries, which are fortunately the terrain for particular disciplines, in this case musicology and its internal divisions, but its main task is to spur different voices to talk and converge, arriving at a better picture of the problem. Yet it cannot be said that a philosophico-logical approach surpasses any of the answers from phenomenology or ontology presented here, but its aim is to show they can coexist in an explanation about the topic of time in music, which is more integral.

The methodological use of analogy between time in general and musical time relates to the question of *verosimilitude*. Verosimilitude is not understood as inferior truth here but as a genre different and of different origin from truth as certainty. Verosimilitude in this sense, not involved in a division between truth and error, consists of an amplification of contexts and possibilities, a factory of possible worlds, which is by the way the core of aesthetic experience.<sup>672</sup>

The context of the discussion originates in the structural homology that presents diverse theories of time and musical forms. The analogy involves notions of general time theories and the time of music. Analogy as a resource for explanation is not totally equal here to its logical sense, i.e., as a probable reasoning. Neither is it equal to a

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<sup>672</sup> Hernández Sánchez, Domingo, “Arte y verosimilitud: Teoría del arte como teoría de lo verosímil”, 2001.

metaphorical description that is used in order to strengthen an argument, as we know from Plato's allegories. Given this opportunity, the use of analogy is associated with explanations that amplify argumentation. In this case, it can be identified under a relational syllogism: if *a* then *b* and if *b* then *c*, as a result, if *a* then *c*. Where *a* is: a theory of time; *b*: logical forms that express this theory; *c*: musical form that exhibits this shape. We deduce that if a theory of time, such as for example branching time, is related to the logical formulation of it, and this logical shape is at the same time proved to work in a determined musical form, then the above mentioned theory of time relates to the musical piece explaining a fundamental part of its meaning.

The analogy time in general-time in music made it possible to deepen an installed thesis coming from musical formalism according to which the sense of music does not reside in any 'pathological' or sentimental hearing, but in a free formal play or *arabesque*. By the analogy here tested, music, on the contrary, is seen as a highly significative form; not empty, it becomes a true temporal reflection made through a sonorous medium. Music represents by means of its distinct elements something internal to itself, potentially linked with time ideas and using these elements in certain conventional ways, displaying different temporal meanings. The different chapters have dealt with musical temporal constitution, musical reflection of time conceptions, musical organisation in time, and finally with the provision of a broad analysis showing a plurality of connections.

The category of circularity, with its 'strict' and 'broad' distinctions, can be seen as analogue to the 'atemporal' (Fraser) and 'vertical' (Kramer) times, and its interpretation suggested reflections linked to theories of the eternal return of the same or similar cycles in philosophy. Within circularity as a broad concept, the important conception of presentism was also introduced.

'Branching' and 'branched' times can be seen as roughly although not exactly corresponding to the previous 'prototemporal' level and 'moment-form'. However, a philosophical account of these temporalities in music tried to show the linking connections of musical structures which have become common for the artistic music of the XX and XXI centuries, with old metaphysical inquiries around determinism and free will, and finally with theories of modal realism and multiple worlds.

The linear-directed time levels in music, were here read in terms of 'progressive' (with direction but not still showing an overall musical logic), teleological 'exegetical' (antecedent-consequent relationships in the form of unfoldings) and 'dramatic' (a temporal form having the seeds at the beginning of the progression, so it must be understood at the end as a complex case of non-progressive at the same time that it is

progressing) and lately, just as a culmination in ‘extreme’ linearity (strict antecedent-consequent relationships). The distinctions presented here for linear time are profoundly intertwined with philosophical developments that conceive time in terms of this shape and the sense of time reinforced by the apparition of the clock and modern societies in the Western world. The importance of this translation is that it is not merely a change of names but it aims to give an insight into philosophical ideas of time appearing in music.

Time however is not an homogeneous concept but depends on different perspectives. It is a crucial part of the understanding of time that there must be understood from an anthropological point of view. Ginastera’s music faces us with a particular perception of time. This thesis provided a general framework from which external global conceptions of time were presented but it also suggested necessary a deeper inquiry into internal particular interpretations of time in music. Latin American times suggest a sense of direction in time which is complex, so both teleological ‘exegetical’ and ‘dramatic’ understandings are exhibited; also a circularity signed by the similar cycles proper of the Andean understanding of time; a branched structure finally which is particularly depicted by the image of the garden of forking paths and musically developed by the confluence of several languages and times coexisting.

As a conclusion, resorting to the analogy time-in-general/time-in-music brings a more complete view of art objects, and claims for them ultimately a legitimate cognitive status. The purpose of the whole research ends justifying an idea that is found in Hegel’s *Aesthetics*, “what are we searching for both in art as in thought, is truth”,<sup>673</sup> although for the first, clearly, we accomplish it through the senses.

It must finally be discerned what philosophies of time can be said to be the basis of this whole inquiry. Dahlhaus based his article in the Aristotelian notion of time. Similarly, Monelle’s insight on musical temporality was sustained in Husserl’s thoughts about time. A tacit connection with a Kantian sense of time is exhibited by this thesis in that time is here conceived as condition of possibility not for knowledge in general but for the possibility of music. Still, a plurality of philosophies of time could be considered substantial to this thesis in general, since one or the other has served for reflecting about the musical temporal modes.

Particularly, the history of metaphysics about time has been read through the glasses of essays by Jorge Luis Borges. The election was natural since the writer chooses one or the other classic theory of time without putting emphasis on any of them (and sometimes contradicting himself), just employing them as an aesthetic pretext. He was entertained by them, playing with them as colours to be dismantled. This task is

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<sup>673</sup> Ch. 1, Sec. 1, 3.

basically the same reproduced by composers who decide one or the other time structure to provide still a ‘serious’ reflection on time but free of definitive results. Borges once reflected about time ideas as “all equally plausible and equally unverifiable”<sup>674</sup>.

Topics such as cognition and time in music, the role of music in teaching something about time beyond discursive reflections, and the general question of creativity and imagination in the borderlines of rationality and its fundamentals, are future interests of research that can departure from this basic inquiry. Inside the general perspective of reevaluating the aesthetic dimension for cognitive purposes, this study of time in music suggests the line of a metaphysical open path of profound links between *being* and *time*, which is a limit for the present inquiry.

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<sup>674</sup> Borges, 1936, p. 14.

## APPENDIX

### I - Preludio y Canto a la Aurora.

¡Oh tú, Tzacol, Bitol,  
miranos, escúchanos!  
¡No nos dejes, no nos desampares,  
corazón del cielo, corazón de la tierra!  
¡Protege a nuestros hijos, a nuestros descendientes,  
mientras camine el sol y haya claridad!  
¡Que amanezca, que llegue la aurora!  
¡Danos buenos amigos, danos la paz!  
¡Oh tú, Huracán, Chipi-Caculhá,  
Raxa-Caculhá, Chipi-Nanauac,  
Raxa-Nanauac, Voc, Humahtupú,  
Tepeu, Gucumatz, Alom, Qaholom,  
Ixpilyacoc, Ixmucané,  
creadora del sol, creadora de la luz!  
¡Que amanezca, que llegue la aurora!

### II - Nocturno y Canto de Amor.

Tu amor era como una lluvia de flores perfumadas.  
Tu canto era hermoso como el del pájaro de oro.  
La luna y el sol brillaban sobre tu frente.  
Has partido.  
Largas y tristes serán mis noches solitarias.

### III - Canto para la Partida de los Guerreros.

Tiembla la tierra.  
Se inician los cantos  
de los guerreros.  
Águilas y Tigres  
comienzan a bailar.  
En la montaña  
el clamor de las fieras;  
en la pradera  
el tambor de la guerra.  
Tiembla la tierra.  
Mirádlas: son los guerreros.  
Admirad su valor.  
Nacieron entre el fuego.  
Las lanzas rivales  
forjaron su coraje.  
Contemplad sus adornos.  
En sus cabezas se agitan los cascotes  
con plumas de las aves de la selva.  
Los dientes de sus enemigos  
engalanan sus pechos;  
usan los huesos como flautas

### I - Prelude and Song of Dawn.

O, thou, Tzacol, Bitol  
Look on us! Be kind to us!  
Do not leave us! Please do not forsake us!  
Mighty God of heavens, spirit and heart of this land!  
Protect our sons and daughters, protect all our descendants,  
while the sun walks above and gives forth its light!  
Make the sun rise, and make a new day be!  
Give us trustworthy friends, and grant to us peace!  
Oh, thou, Huracán, Chipi-Caculhá,  
Raxa-Caculhá, Chipi-Nanauac,  
Raxa-Nanauac, Voc, Humahtupú,  
Tepeu, Gucumatz, Alom, Qaholom,  
Ixpilyacoc, Ixmucané,  
O, creator of sun, creator of the light!  
Make the sun rise, and make a new day be!

### II - Nocturne and Love Song.

Your love was like summer's rain  
perfumed with scent of fresh-cut blossoms.  
Your singing was delicious  
equal to songs of the golden bird.  
The moon and the sun  
for ever shone all around you.  
Gone you are now.  
Endless and sad are the lonely nights I am without you.

### III - Song for the Warriors' Departure.

Earth again trembles  
trembles! trembles! trembles!  
earth again trembles!  
The song of the warriors  
announces fighting.  
Eagles and Tigers are starting  
their dance  
up in the mountain  
angry beats are roaring  
down in the valley  
threatening drums are beating.  
Earth again trembles  
trembles earth again trembles  
behold them these are our warriors  
courage runs through their reins  
on tire they fed and flourished.  
In war, rival spears and arrows  
have forged their courage  
see what trophies adorn them!  
On their heads helmets  
with feathers of birds



y piel humana vibra estirada en los tambores.  
Tiembla la tierra.  
Ya se escuchan los gritos  
de los que van al combate.  
Los guerreros hacen nacer,  
rojo como la sangre,  
el sol.

V - Canto de Agonía y Desolación.

¡Adiós, oh cielo!  
¡Adiós, oh tierra!

Mi valor y mi bravura  
no me sirven ya.  
Busqué mi camino  
bajo el cielo, sobre la tierra,  
separando las hierbas y los abrojos.  
Mi enojo y mi fiereza  
no me sirven ya.

¡Adiós, oh cielo!  
¡Adiós, oh tierra!

Debo morir, debo desaparecer aquí,  
bajo el cielo, sobre la tierra.  
¡Oh, punta de mi lanza!  
¡Oh, dureza de mi escudo!  
Id vosotros a nuestras montañas, a nuestros valles.  
Yo solo espero mi muerte,  
bajo el cielo, sobre la tierra.

¡Adiós, oh tierra!  
¡Adiós, oh cielo!

VI - Canto de la Profecía.

Cuando lleguen los días sin nombre,  
cuando aparezca la señal de Kauil,  
en el once Ahau,  
cuando vengan los hermanos de oriente  
¡sonará la sonaja, sonará el atabal!

Al amanecer arderá la tierra;  
bajarán abanicos del cielo,  
en el once Ahau,  
con la lluvia verde de Yaxalchac.  
¡Sonará la sonaja, sonará el atabal!

En el katun que está por venir  
todo cambiará;  
derrotados serán los hombres que cantan,  
en el once Ahau.  
¡Callará la sonaja, callará el atabal!  
¡Callará...! ¡Callará...!  
¡Callará...!

which they hunted in the forest.  
Their necks show proudly strings of teeth  
they got of men killed in battle.  
Bones make the flutes  
with which they play war songs.  
Tight is the skin of foes that makes  
the drums which they are beating.  
Earth again trembles  
trembles, trembles, trembles  
earth again trembles  
Now listen to shoutings  
of these men who go to the fight  
brave, wild warriors make the sunrise  
bright red, bright red  
bright red, bright red  
like blood is the sun  
the sun, the sun.

V - Song of Agony and Desolation.

Farewell, O heavens!  
Farewell, O my land!

My valor and my bravery  
are no use to me.  
I sought my way  
I roamed right on this land and under these skies,  
removing the grass, separating herbs and thorns.  
My fury and my fierceness  
I will leave aside.

Farewell, O heavens!  
Farewell, O my land!

Now I must die, and never again will I wander  
over this land and under these skies.

Farewell, O my land!  
Farewell, O heavens!

VI - Song of Prophecy.

Days of utter black woe will come down,  
when over our land appears the sign of Kauil,  
on th'eleventh Ahau,  
when our brothers from eastward come over.  
Fierce and loud sound the timbrels!  
Fierce and loud roll the drums!

All the land will burn on the eve of daybreak,  
and big clouds of the sky will invade us,  
on th'eleventh Ahau,  
will descend the green rain of Yaxalchac.  
Fierce and loud sound the timbrels!  
Fierce and loud roll the drums!

For the Katun about to befall  
will change this land;  
they who now sing will then be defeated,  
on th'eleventh Ahau.  
Mute and dead grow the timbrels!  
Mute and dead grow the drums!  
Mute and dead! Mute and dead!  
Mute and dead!

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