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UNIVERSITY OF OTTAWA

Musical Time and Recording Technology:

A Perspective from Music Theory

by

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Abstract

This thesis deals with two categories of musical time, concrete and subjective, and the effect of recording technology on musical time. Concrete musical time can be measured in an objective way, for example, through reference to standards of time external to the listener, such as clocks. Subjective musical time refers to the musical time that cannot be measured objectively; it depends entirely on the listener who experiences the musical work. It is my conclusion that recording technology affects the concrete aspect of musical time, but not the subjective one.

Chapter one defines the relationship between time and different forms of art, as well as the relationship between time and music. Chapter two defines concrete and subjective musical time. Chapter three discusses recording technology and the changes it imposes on the musical aesthetic ritual. By musical aesthetic ritual, I mean the agreed-upon physical actions which are related to the activities involving music and the experience of music. Chapter four explains the influence of recording technology on certain musical aesthetic ideas such as the reproduction of music, the completeness of the musical work, and the temporality of the musical work. Chapter five presents my

conclusions with regards to the influence of recording technology on concrete and subjective musical time.

Table of Contents

Introduction

This thesis is about the relationship between time and music, musical time, the definition and categorization of musical time, and the influence of recording technology on that categorization of musical time. The thesis is divided into five chapters: "Artistic Time, Musical Time and Musical Process," "Musical Time: Definition and Categorization," "Recording Technology and its Impact on the Musical Aesthetic Ritual," "Manipulation of the Recorded Sound and its Effects on Certain Musical Aesthetic Ideas, with Emphasis on the Concept of Musical Time," and "Conclusions: Concrete and Subjective Musical Time, and the New Technology."

The first chapter concentrates on the relationship between time and art and, more specifically, on the relationship between time and music. It addresses the need for time in the musical process, and the question of how music establishes its own present through sound. The importance of time in the musical process is presented through the introduction of Roman Ingarden's writings with his discussion of the individuality of the musical piece.

The second chapter defines two categories which interact in the musical process, concrete musical time and subjective musical time. This chapter also discusses problems found in the critical literature regarding musical time and its categorization. One of the problems I found is the lack of unanimous and precise terminology for the concept of musical time and its categories. Another issue is the inconsistency among scholars regarding the inclusion of different categories in the definition of what constitutes musical time. I present definitions of the concept to exemplify this inconsistency. Writings by Jonathan Kramer and Thomas Clifton aid me in the introduction of a model of musical time and its categories.

The third chapter concentrates on recording technology and the changes it imposes on the musical aesthetic ritual. These changes are presented because, as we shall see, they greatly influence the concept of musical time. The changes in the musical aesthetic ritual are presented mostly from the point of view of the listener because it is the intention of this thesis to present the subjective experiential viewpoint of the subject who perceives the musical piece. This chapter presents definitions of the terms "ritual" and "musical aesthetic ritual." The musical aesthetic ritual as it is performed by the listener in the concert hall changed greatly with the appearance of the new recording technology. Future work on

the subject will allow me to explore in greater depth these changes in musical aesthetic ritual as they influence both the composer's and the performer's participation in the musical experience.

The fourth chapter discusses the influence that the new recording technology and the consequent changes in the musical aesthetic ritual had on certain musical aesthetic ideas, particularly on the concept of musical time and the categorization presented in the second chapter of this thesis. The musical aesthetic ideas presented here in the light of the new technology are: reproduction, completeness, and temporality of the musical work. This explanation is followed by the presentation of a discussion between two scholars, Joan Stambaugh and Patricia Carpenter, on musical form and its relationship to musical time. This discussion will help define the influence of recording technology on concrete and subjective musical time.

The fifth chapter presents my conclusion concerning the influence of recording technology on concrete and subjective musical time. My conclusion is that while the concrete musical time of the musical work is deeply influenced by recording technology, because of the power acquired by the listener to manipulate the chronological succession of musical events and, therefore, to manipulate its form, the subjective musical time of the piece cannot be

as dramatically altered because it is a subject's domain and, as such, the subject must grasp the musical piece and its content, regardless of whether the chronological succession of musical events is altered or not.

Chapter I

Artistic Time, Musical Time and Musical Process

This chapter discusses of the relationship between time and art and, in particular, between time and the musical process. The study of this relationship is of crucial importance to the aesthetics of music because no musical process would exist without time. Time is an essential component in music.

Every art creates particular relationships to time and particular categories of time. These different types of time are created by expectations, memories, and the present. In the case of music, music creates its own temporal categories through the combination of musical attributes, which generate the musical expectations, memories, and present: the musical time.

That music and the musical process involve time might seem self-evident; however, one important aspect of this relationship is how time is involved in the musical process. As I demonstrate later in this chapter, the very individuality of a musical piece is based on the concept of

musical time because time gives each musical work a certain distinctive quality that will be particular to that musical piece.

The first section of this chapter discusses the importance of time in art in general, and in music in particular. These matters are explored through an explanation of what constitutes artistic time, and how this concept applies to music. The second section defines the terms "process" and "musical process" in order to explain their relationship to time. The third section is concerned with the question of how time relates to the musical process. This matter is presented thorough a discussion of the individuality of the musical piece.

1. The Importance of Time in Art. "Artistic Time" and Musical Time.

Time is an essential element of all arts, including music, but different arts generate different types of time. Artistic expressions need time in which to present and unfold themselves. There exists a time common to all arts, a time which is required for the unfolding and presentation of any art, but each artistic expression creates a certain variety of time which is exclusive to it. Micheline Sauvage writes in her article "Notes on the

Superposition of Temporal Modes in the Works of Art," about time in different arts, and how different types of time are superimposed in three different artistic expressions: drama, poetry, music. She explains that each art uses a different superposition of temporal modes, but she asserts that every work of art "uses time as one of its working elements" (1). She explains that a sonata, a poem, or a play are temporal because they require time for their presentation and unfolding. From Sauvage's explanation about the importance of time in art, I conclude that for whatever art we discuss, we must bear in mind one thing: art only gains expression through time.

When the work of art defines its own "now," its own present, and its own being, it generates expectations for what is coming, as well as memories of past events. This leads to the creation of a time specific to that work of art: the "artistic time," as Micheline Sauvage calls it. Particular types of time, specific to each art, are generated by expectations and memories. As Micheline Sauvage suggests, in addition to being unfolded in time, every art creates a particular type of time specific to that art. This means that each art produces in time its own "artistic time": musical, dramatic, or narrative, and this artistic time is created by artistic expectations and memories, once the artistic present is defined. Each artistic expression

has different ways to define that "now", creating different expectations and memories. Therefore, each art creates a different type of artistic time: a temporal category unique to that art (2). As an example, we can can compare the artistic time of a dramatic play with the artistic time of a painting. The artistic present of a dramatic play is developed in a different way than the artistic present of a painting. The first one presents a certain time, actual time, in which the work is developed, while the last one gives the spectator the freedom to take the needed time to appreciate the work.

One specific art concerns us here: music. Music tries to organize and regulate time through sounds (3). The musical present, that is the musical "now," is organized through the combination of musical attributes such as harmony, rhythm, and melody, which generate musical expectations and memories. The expectations and memories created by the musical present generate the artistic musical time.

While Micheline Sauvage expands on the matter of artistic time in a general way, J. T. Fraser gives a specific definition of how the artistic musical time is generated and defined. He explains that:

> once the musical present has been defined through sound, the combinations of pitches, rhythms, melodies, variations in timbre and texture--all the combinatorial means of music--may begin the creation of musical expectations and memories or, in a shorter phrase, musical time (4).

The way Fraser uses the term "sound" can be related to his definition of the concept of musical present: Fraser defines the term musical present as the transformation of cacophony into polyphony, by whatever rules composer, performer, and listener find acceptable. The basic notion of one tone or a coordination of many tones is what he explains as being "sound" once it is transformed into polyphony. This sound suffices to create a musical present. He writes:

> even a single instrumental or vocal tone gains its musical value through an instant-by-instant coordination of pitches and amplitudes. A solo tone is a polyphony of a fundamental note and its harmonics, determining through their coordination a musical present (5).

Fraser asserts that even only one tone gains value because it yields a certain polyphony; therefore, it can create a musical present.

I conclude that musical presents, made evident by the organization of certain musical attributes, enable the creation of musical expectations and memories: the creation of musical time.

At this point, we cannot deny that time is elemental in music, as it is in any other art. Time is a crucial component of music. Without time no music would exist (6). The combination of that essential time and at least one other musical element such as rhythm or melody, is sufficient to understand an event as being musical.

2. Musical Process

This musical event--the association of time and one or more musical attributes--I assign the term "musical process." I must first define the term "process" so I can later expand on the definition of "musical process." "Process" is defined as an operation that consists of a series of actions systematically directed toward a particular result or end (7). These series of actions imply the necessity to be executed in time. Taking this definition, and relating it to music, and to the musical events, we conclude that a "musical process" would be established by associating a series of musical events toward

a musical result. The musical process, in the same way every other process does, requires time to accomplish its result. (I will expand on this matter of musical process and its results in the third section of this chapter.)

The musical process requires time for its development. There are three characteristics of that time as it relates to the musical process: it is essential, it is objective, and it is irreversible. Time is essential to that musical process; therefore, time is indispensable in music. George Rochberg explores how duration relates to experience, and to the perception of music. He writes:

> music's great power over all men fundamentally derives from the engagement of the sense of duration in the listener, perceived as motion, as movement, as the occurrence of successive events which culminate in a sense of fullness of experience, of a sonorous content whose passage in time is rich and meaningful (8).

If we try to imagine how any piece of music could even exist without time, or without being developed through time, we would understand how fundamental time is in relation to music. From the Gregorian chants to electronic music, one of the few components that remains unalterable and

indispensable for music to exist is time (9).

The other characteristics of time are the qualities of having an "objective and irreversible order," as Philip Alperson refers to them. The unfolding of any piece of music, and the musical process, is experienced through time, a time which goes from past to future (10). We cannot experience it backwards because the time of the presentation of music is irreversible. The presentation of a musical piece is always progressive, there is an irreversible order to its presentation, to its development in time, as it is to the perception of musical time itself. We must hear it from past to future. Even if the piece is played backwards we still have to listen to it from past to future.

Philip Alperson writes in his article "Musical Time and Music as an art of Time," about musical time, the temporal ordering of tones for musical perception, and the distinction between musical time and other kinds of artistic time. When discussing music as an art requiring time, Alperson asserts that music is

> an art whose method of presentation is progressive in time, a piece of music is a piece with all phenomena which occur in time: it has a

determinate period of duration; an objective and irreversible time order (11).

We do not perceive that progressive musical time separated from time; rather, musical time is an instance of time.

3. Time in the Musical Process

All musical processes unfold through time (12). I have defined "process" as a series of continuous actions directed toward a particular result or end. I have also pointed out that these continuous actions imply the necessity of being executed in time. The musical process, in the same way as every other process, entails a series of continuous actions that require time; like any other process, it requires time to accomplish its result. In music, one of many expected results would be to establish a relationship between composer, performer, and listeners. Another expected result of that musical process is the creation of the present, expectations, and memories: the creation of musical time.

The result or results of a given musical process are unique. The time of the musical process, which brings about certain results, gives every piece of music a certain

quality which differentiates it from any other musical work. This quality, yielded by the time of the musical process, is of crucial importance in Roman Ingarden's discussion of the individuality of the musical piece.

Examples of the importance of time in the musical process can be found in Roman Ingarden's writings. In his book Ontology of the Work of Art, Ingarden tries to answer a fundamental question: what exactly is a work of art? He explores different ways of looking at the ontology of certain artistic expressions, such as music, painting, architecture, and film. Regarding the musical work, one of the ways in which Ingarden explores its individuality is through time. He asserts that "the individuality of a musical work is bound up with its location in space and time" (13). In his explanation of the relationship between the musical process and time, he maintains that,

> 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 (14).

At the beginning of this quotation Ingarden discusses the process which he qualifies as being unfolded in a definitive and nonrepeatable segment of time. This has to do with the characteristics of the time of the musical process I presented earlier: this time is objective and irreversible. If the segment of time is definitive, objective, and nonrepeatable, as Ingarden asserts, it must be irreversible as well. When that process relates to a subject, what Ingarden explains as entering "our perceptual field," this process acquires a certain time quality particular to it. Ingarden explains that this time quality is derived from the concrete time which is definitive and nonrepeatable. He also asserts that this time quality is constituted as a part of this concrete time, and not as something external to it.

Ingarden discusses time as an irreplaceable necessity in every process. He explains that the distinctive quality of a piece comes from the piece being "constituted" in time by the "unfolding of its phases." Music, as a process entering our perceptual field, requires time for the unfolding of its phases, in order to determine its distinctive quality. Time lends a unique distinctive quality to a piece through its unfolding and development: through modifications in time (15).

Ingarden applies the general concept of the importance of time in the musical process to a more specific idea: the understanding of the individuality of a musical work, accomplished through modifications in time. Modifications of tone formations, accomplished through time, give each musical work its individuality. He writes:

> In the reciprocal qualitative modification of the tone formations occurring together or following in sequence, and in the quality of wholeness, unique in its kind, that results from this reciprocal qualitative modification, lies the sole basis of the individuality of a musical work (16).

With this statement Ingarden elaborates and clarifies the quotation presented earlier regarding the distinctive quality of the time of the musical process.

What Ingarden presents as "tone formations" can be related to the concept of "sound" as explained by J. T. Fraser. Fraser discusses the transformation of cacophony into polyphony, polyphony defined even by a sole note with its harmonics. Ingarden's term "tone formations" seems to be somewhat more elaborated than Fraser's because it is applied with sounds in interrelation: he writes about tone formations occurring together or following in sequence.

Ingarden also explains that a certain quality of wholeness derives from a reciprocal modification of those sounds. Ultimately, Ingarden says, the individuality of the musical work is derived from that reciprocal modification of tone formations. Time is crucial for this idea of modification because any modification of tone formations must be developed in a musical process which will occur in a segment of concrete time. Ingarden also talks about those modifications as occurring in sequence, another notion that requires time for its fulfillment (17). Finally, the author refers to this modification of tones through time as the sole basis for the individuality of a musical work. This modification of tones is what constitutes the musical process.

I conclude that the individuality of a piece of music is mainly based on modifications of tone formations through time. This idea can be related to the definition of a process: a series of actions, in this case modifications of tone formations through time, systematically directed toward a particular result, in this case an individual musical work.

Up to now, my intention has been to present and explain some crucial matters in the relationship between time and art in general, and between time and music in

particular. Firstly, I discussed the importance of time in art and the notion of different artistic types of time. Secondly, I introduced the matter of process and musical process, and temporal irreversibility, order, and indispensability in that musical process. Finally, I discussed the importance of time in the musical process, through the exposition of an ontological problem as it is manifested in the individuality of the musical piece. What I explored in this first chapter was how music and musical processes involve time, and how the musical process can only exist in time. As we can conclude from the discussion of Ingarden, the very individuality of the musical work depends on the notion of time.

In chapter two I will explore some of the problems that arise when the nature of that time is examined, especially in regards to the definition of different types of musical time.

References

1. Micheline Sauvage, "Notes on the Superposition of Temporal Modes in the Works of Art," Reflections on Art (New York: Oxford University Press, 1961): 162.
2. The matter of time in different arts is widely discussed in the critical literature. As some examples, I can cite George Rochberg, The Aesthetics of Survival (Ann Arbor: University of Michigan Press, 1984); Rudolf Arnheim, New Essays on the Psychology of Art (Berkeley: University of California Press, 1986); Susanne Langer, Reflections on Art (New York: Oxford University Press, 1961); Gisele Brelet, Le Temps Musical (Paris: Presses Universitaires de France, 1949); Paul Ricoeur, "Narrative Time," Critical Inquiry vol.7, no.1 (1980): 169-190; J.T. Fraser, Of Time, Passion, and Knowledge (New York: George Braziller, 1975).
3. Barbara Barry discusses the formal organization of a segment of time through the musical system in her book Musical Time, the Sense of Order (New York: Pendragon Press, 1990), chapter 5. She asserts that there exists a desire for order and wholeness. She explains that the undertaking to control time by music through order is

based on two human characteristics. One of them is to make sense out of the world around us, to make comprehensible a framework as it is time. The other characteristic is to transform through time an event or deep emotional feeling into a symbolized form as it is music. Through music, she writes, we may control the temporal framework (73-5).

4. J. T. Fraser, "The Art of the Audible Now", Music Theory Spectrum 7, (1985): 181-84. In this article, J. T. Fraser asserts that music can define an audible present which bridges the biological, mental, and social presents, and, through them, permits the creation of musical expectations and memories.
5. Ibid., 183.
6. Jonathan Kramer writes in his book The Time of Music (New York: Macmillan, Inc., 1988) that "music becomes meaningful in and through time" (1), and that "time is the essential component of musical meanings" (2). These assertions might seem obvious, but what is interesting is how different scholars reach the same conclusion by taking completely different avenues. See, among others, Susanne Langer's Feeling and Form (New York: Charles Scribner's Sons, 1953), chapter 7; Thomas Clifton's Music as Heard (New Haven: Yale University Press, 1983), chapter 3; Barbara Barry's Musical Time, the Sense of Order (New York: Pendragon Press, 1991), chapter 1;

Elliott Carter's The Writings of Elliott Carter (Bloomington: Indiana University Press, 1977), chapter "Music and the Time Screen"; David Greene's Temporal Processes in Beethoven's Music (New York: Gordon and Breach Science Publishers, 1982), introduction.

7. Webster's, s.v. "process".
8. George Rochberg, The Aesthetics of Survival (Michigan: The University of Michigan Press, 1984), 71-2.
9. One extreme case that shows how indispensable time is to music is John Cage's work, 4'33". This piece is based on the premise that the performer sits without making any sound for a certain period of time. The only fixed attribute of this piece, which is the only one impossible to remove from this or any other musical work, is time. Other attributes, such as pitch or rests, are given by the environment surrounding the performance of the piece, but they are not fixed to the musical piece in the way that time is.
10. The matter of the passage of time and its continuity from past to present and to future can be better understood by reading philosophers, such as Kant, Sartre, Heidegger and Husserl. Obviously, depending on the school of thought, there will be different answers to this problem. From the texts I came across during my research, Husserl, a phenomenologist, explains this matter most clearly. For him, time is composed of

instants or infinitesimals. He emphasizes that time (concrete time) is continuous, and that this continuum is made up of dense continuum points. The "now" divides up this time. On the subject of how perception gets to experience time, Husserl explains that there is a three-feature structure in our mental life: the now-consciousness feature, the retentional feature, and the protentional feature. To describe them briefly, we can say that the now-consciousness is the sensing of the present state of the world; the retentional feature is the awareness of the previous phase, the just-past; the protentional feature is directed to the awareness of the later mental phase, the future. For a more complete discussion see, for example, Thomas Clifton, Music as Heard (New Haven: Yale University Press, 1983); J.T. Fraser, Of Time, Passion, and Knowledge (New York: George Braziller, 1975); Martin Heidegger, History of the Concept of Time (Bloomington: Indiana University Press, 1985); Martin Heidegger, Being and Time (New York: Harper and Row Publishers, 1962); Edmund Husserl, The Phenomenology of Internal Time-Consciousness (Bloomington: Indiana University Press, 1966); Peter McInerney, Time and Experience (Philadelphia: Temple University Press, 1991).

11. Philip Alperson, "Musical Time and Music as an Art of Time," Journal of Aesthetics and Art Criticism 38, no.

4 (1980): 407-17.

12. This relationship between time and the musical process is of crucial importance in the critical literature. As an example I cite Jonathan Kramer's assertion: "every musical process takes place in time," from The Time of Music (New York: Macmillan, Inc., 1988), 2. It is evident in this quotation that Kramer characterizes music as being a process; a process that unfolds through time. Another example of this relationship between time and the musical process can be found in David Greene's Temporal Processes in Beethoven's Music (New York: Gordon and Breach Science Publishers, 1982), where he asserts that:

> musical pieces directly present images of temporal processes and one's sense of the temporal process in which one is involved is directly implicated in one's sense of human experience at its most fundamental level (6).

In this case Greene is referring to the experience of music, as it is affected by the temporal process of the piece. He also is referring to the musical process in direct relation to time.

13. Roman Ingarden, Ontology of the Work of Art (Ohio: Ohio University Press, 1989), 36.

14. Ibid., 37-8. In this respect, Ingarden goes on to say that

this specific time quale characterizes only the moments and phases of concrete time belonging to the mode of being of processes and not the objective, abstract time of physics (Ibid., 38).

He is qualifying concrete time as belonging to a certain process, in this case, the musical process.

15. Ingarden also explains that:

the quale of a present moment of concrete time is necessarily codetermined by the temporal colorations of earlier phases, and especially the phase just past (Ibid., 38).

This assertion corresponds to my discussion of memories and expectations which create, along with the present, the musical time.

16. Ibid., 37.

17. When referring to **reciprocal modification**, Ingarden alludes to the interaction between the environment surrounding the work, and the work itself. He writes that:

individuality results from the fact that each of the pure qualities of the tone formations of a certain phase of the work occurs in such a total stock, in such an environment of other pure qualities that, on the one hand, it itself acquires a unique coloring that it would never have if anything at all in this environment were

modified, and, on the other hand, from this total stock of qualities emerges a quality of wholeness that is something absolutely unique (Ibid., 36-7).

Chapter II

Musical Time: Definition and Categorization

This chapter is dedicated to a discussion of musical time, and the different categories of musical time which interact in the musical process. As I explained in chapter one, a musical process is defined as a series of musical events directed toward a certain result, for example, to establish a relationship between composer and listener, or between performer and listener. I also pointed out that the musical process requires time for its development, and that the individuality of each musical piece is derived in part from the time of the musical process. Problems arise when the nature and categorization of that time is examined.

There are at least two categories of time interacting in the musical process. I call them "concrete musical time" and "subjective musical time".

Concrete musical time involves a musical time that can be measured in an objective way, for example, through comparison to different standards of time such as clocks or musical tempi. This concrete time can be related to all our

activities. When it is related to musical activities, it constitutes the concrete musical time of the musical work. As an example we can think of a comparison between tempi. When we encounter two different performances of the same work and compare their tempi, we can establish either a similarity or a dissimilarity between them. In either case, the comparison involves the identification of a certain referential tempo, a concrete temporal characteristic of the musical performance. Another example of the concrete musical time of a musical piece is its association to the passing of clock time. When we estimate the time spent in the performance of a piece by looking at a clock, or when we estimate the number of minutes elapsed between two points of the performance, we are determining a concrete temporal aspect: the clock time required for the piece to unfold.

Subjective musical time is specific to the experience of music and cannot be measured objectively. In the experience of subjective musical time there is no reference to objective standards. Different states of mind can influence the musical temporality as it is experienced by the subject. As an example of subjective musical time, let us assume two listening sessions at two different times of the same recording. In the first listening session, the subject perceives the performance as being slow, and inappropriate to the work; in the second listening session,

the performance is characterized as moderate, and more suitable to the work. These discrepances in perception can be due to different circumstances that might affect the subjective time, such as, different states of mind, psychological factors, personal emotions, a person's metabolism.

I found two problems in the critical literature with regard to discussions of musical time and its categorization. The first problem is terminological: the lack of precise and consistent terminology to denote similarly defined categories of time. Even if different scholars define the two categories of musical time, concrete and subjective, in similar ways, they do not agree on the terminology to denote those two types of musical time.

The second problem concerns the inclusion of two categories of time in the definition of what constitutes musical time. The problem arises because the interaction between these two types of musical time are not acknowledged by all scholars in their definitions of musical time (1). This is part of another problem: some scholars, such as Thomas Clifton, do not perceive a distinction between concrete and subjective ordinary time. In Clifton's case, as we shall see, the rejection of the distinction between concrete and subjective ordinary time comes from the school

of thought he addresses.

This chapter is divided in two sections. The first section is concerned with the definition of the two categories of musical time, concrete and subjective, and exposes the problems found in the critical literature regarding the terminology used to denote these two temporal categories. The second section presents a model of musical time and its concrete and subjective components in light of ordinary time (time which is not specifically musical). This section is concerned with a discussion of Jonathan Kramer's and Thomas Clifton's writings.

1. Concrete and Subjective Musical Time in General

As noted in the introduction to this chapter, there are at least two categories of time that interact in the musical process. One category involves a time that is common to all our activities, including music, a concrete time. When that concrete time enters the field of music, I call it "concrete musical time". The other category is concerned with our perception of time, a subjective time. When that subjective perception of time is related to our perception of music, to a time which is distinct to music, I call it "subjective musical time".

The musical process needs a certain concrete time span for the unfolding of its phases. As I pointed out in the first chapter, the musical process needs time to develop and to accomplish its results. One of the temporal categories of the musical process is objective, can be measured by a clock, and is one-dimensional and irreversible. I shall coin a term to denote the concrete time that is common to all activities, including music and the musical process: "concrete musical time" denotes that aspect of concrete time found in the musical process.

There is another type of time which interacts with the concrete time of the musical process, a time that cannot be measured by a clock, and that is exclusive to the experience of music: a subjective time. I define the term "subjective" as the domain of the subject, something entirely dependant on the person experiencing the piece of music. It does not admit any comparison with universal standards. Let us recall the earlier example regarding the two listening sessions of the same recording, and the different temporal perceptions experienced in each. In the first listening session, the performance was categorized as slow and, therefore, inadequate to the work, while in the second listening session the same recorded performance was described as moderate and suitable to the piece.

We need a term that differentiates the subjective time of the musical experience from any other subjective experience of time. The term "subjective musical time" denotes a subjective time that is experienced only through the musical process.

A terminological problem emerges because we find in the critical literature that different scholars give different names, or no name at all to the two distinct temporal categories just discussed, although those categories of time are defined in similar ways. This difficulty arises because there is no terminological way established to distinguish between a time that is common to all of us and to all activities, and a time that is particular to the experience of music.

The disparity in terminology for these two categories of musical time is demonstrated by the number of different names that are given to these two categories of time. For example, the term "ordinary time" in Jonathan Kramer's writings, is elsewhere called "absolute time," "clock time," "normal time," "ontological time," "real time," "public time," or "actual time." What Kramer calls "musical time" is also called "subjective time," "psychological time," or "virtual time." I will briefly discuss these terms and the circumstances in which they are

presented in the critical literature.

A) Concrete Musical Time

i) Concrete time

There exists a similarity between Susanne Langer's and Jonathan Kramer's definitions of the general category of time that is one-dimensional and abstracted from experience. Langer calls "clock time" the time that can be measured by a clock, and that is separated from an experiential time. Langer explains that

> this one-dimensional, infinite succession of moments (clock time) is an abstraction from direct experience of time, and it is not the only possible one (2).

This definition matches what Jonathan Kramer calls "ordinary time." He explains that "ordinary time" is the time that is shared by most people through physical means of measuring (clocks), and that is agreed on as a social convention. He uses the term "ordinary time" as a synonym for "absolute time." Kramer says that absolute or ordinary time is a "moment-to-moment succession" (3) and that it is "measurable, whether by beats, pulses, or seconds" (4).

In a similar manner, Thomas Clifton defines his term "world time" as a type of time that is common to all of us. There are some difficulties regarding the definition of this concept because Clifton seems to contradict himself. On the one hand, Clifton refuses the term "objective time" by explaining that a time completely independent from the subject cannot exist. On the other hand he acknowledges the existence of a world time, a category of time that would definitely be isolated from subjective experience (5). I shall expand on the explanation of these difficulties in the second part of this chapter.

Similar to Susanne Langer's term "clock time," is Barbara Barry's term "public time," which she uses to denote that type of time that can be measured by a clock. She sees public time as a convention between people. Barry writes that "the equal units of hours and minutes constitute public time" (6).

From this discussion of the different names used to designate one specific category of time, and the circumstances in which they are used, what emerges is that all of them are employed to denote that type of time which is common to all activities, and which could be measured objectively by a clock.

ii) Concrete Musical Time

As seen above, some scholars, such as Kramer, Langer, Clifton, and Barry, acknowledge the existence of a concrete time, common to all activities, which can be measured. They describe this temporal category from a general point of view, not specific to music. Conversely, Igor Stravinsky talks about this category of time as it applies to music and to the musical experience.

"Ontological time" and "real time" are terms applied by Igor Stravinsky to denote the concrete, objective musical time (7). Stravinsky approaches this category of time from the point of view of the relationship between the musical object and the subjective experience of that object. Stravinsky describes an "euphoria" induced by ontological time, which comes from the fact that this category of time does not dislocate the centers of attraction and gravity; it is a stable temporality, which can be measured. Its stability gives the listener a sense of serenity. This differs from what Stravinsky calls "the other kind" of time, which dislocates the centers of attraction and, therefore, gives a certain temporal instability. This kind cannot be measured. It relates to the subjective constituent of musical time. He explains that the two kinds of music by explaining that

> one which evolves parallel to the process of ontological time, embracing and penetrating it, inducing in the mind of the listener a feeling of euphoria and, so to speak, of dynamic calm. The other kind runs ahead of, or counter to, this process (8).

In a broader sense, Micheline Sauvage talks about a concrete artistic time. She defines this concrete category of time from a more generalized point of view: she uses the term "actual time" to denote the time that a work of art uses as an element to unfold and, therefore, to express its own artistic time. She explains that every work of art whether a sonata, a novel, or a poem uses time as a working element. However, she also explains that "each of them constructs in actual time its own special artistic time, musical, dramatic, or narrative" (9).

B) Subjective Musical Time

i) Subjective Time

The general category of subjective time has to do with the psychology of time perception. Since this category is not directly related to the object of study of this thesis, music, it will not be discussed extensively.

Nevertheless, it is not hard to think of examples where different perceptions of the passing of time in the same situation can exist. There are daily activities that appear to take longer than others, even if the clock time elapsed is exactly the same (10).

Other examples of the subjective experience of time involve the alteration of temporal spans from the actual experienced event to its recollection. During the process of remembering lengths of time of passed experiences we alter the durations subjectively. As Kramer explains, many studies have shown that the subjective experience of time usually does not equal the clock time. He says: "our experience of duration in retrospect may not agree with our experience of duration in passing" (11).

ii) Subjective Musical Time

As noted earlier, I found disparities regarding the terminology used to designate that category of time which is specific to the perception of music. I found that, for example, what Jonathan Kramer calls "subjective time" is sometimes used by him as a synonym for "musical time". He asserts that this "musical time" is exclusive to the subjective experience of music. He explains that "musical

time exists in the relationship between listeners and music" (12). Kramer explains that this subjective, musical temporal category can be experienced simultaneously with the experience of objective time. He says:

> music allows us to experience subjective time without having to remove ourselves from the time experiences we share with other people (13).

Joan Stambaugh, on the other hand, refuses to accept that there is a correspondence between the concepts of "subjective time" and "musical time". She explains that the subjective time of the consciousness is not dependant on outer objects; it is an inner time that flows from experience. Even if musical time lies close to subjective time and shares several elements in common with it, musical time lies entirely in the act of perceiving sound, and is therefore dependant on an external object. In this respect musical time differs from subjective time.

Subjective time, Stambaugh asserts, presents a dichotomy of form and content: time is the form in which thoughts, images, and objects are constituted. In musical time that form cannot be differentiated from content. Stambaugh says that "subjective time remains divided in the dichotomy of form and content" and that "musical time is not

the form for a content which is heterogeneous to it" (14).

Regarding the matter of the correspondence between subjective time and musical time, I support Jonathan Kramer's viewpoint. I do not entirely agree with Stambaugh on the distinction she draws between subjective and musical time. She asserts that what differentiates musical time from subjective time is that musical time lies in the act of perceiving sound, and therefore it is dependant on an external object. Subjective time, I think, also depends on a subjective experience and, therefore, on an external object. Stambaugh also explains that, in musical time, form cannot be differentiated from content. As I shall explain in chapter four, I think, alongside Patricia Carpenter, that the notion of form depends entirely on the understanding of content. The matter of subjective musical time, and the dichotomy of form and content will be taken up again in the fourth chapter of this thesis.

Barabara Barry, in the same vein as Stambaugh, does not acknowledge the interaction of two types of time in the musical process. In her definition, Barry explains that musical time involves perception: the subjective temporal experience. Barry demonstrates that the subjective element is the only one taken into consideration when she states that musical time is the experiential amount of time

passing; she dismisses the concrete elements involved in the passing of musical time, such as the clock time. She writes:

> musical time is the experiential amount of time passing in the course of listening to the performance, either live or recorded, of a musical work - the way that the work is perceived by the listener. This description corresponds to the subjective experience of musical time passing, the processive coming-into-being of successive elements in performance (15).

Barry leaves aside the concrete constituents of the idea of musical time to concentrate upon the subjective experience of musical time. In her writings, Barry, as other scholars do, uses both terms, objective time and musical time, but focuses only on the subjective constituent of the idea. Barry defines what I called "subjective musical time": musical time which is experienced subjectively. Barry's definition is incomplete because it does not include the time that the piece takes to be experienced.

The term "psychological time" is used by Igor Stravinsky in the sense of a "subjective musical time," as opposed to a concrete, "real time". He explains that "psychological time" denotes a time that depends entirely on

the subject who experiences it. This temporal category is modified according to the subject's personal experiences. Stravinsky relates this category of time, experienced when the musical process takes place, with the effect it imposes on our consciousness, and with the subject's disposition. Stravinsky says that this "psychological time"

> passes at a rate which varies according to the inner dispositions of the subject and to the events that come to affect his consciousness (16).

Stravinsky also discusses the relationship between this subjective temporal category, and the "real time" which can be measured by a clock, and which cannot be altered by the subject. He says that variations in psychological time "are perceptible only as they are related to the primary sensation of real time, ontological time" (17). Stravinsky sees an association between the concrete and subjective categories of time as they interact in the musical process (18).

In a similar manner to Stravinsky, Patricia Carpenter and Gisele Brelet also acknowledge an interaction between the concrete and the subjective components of musical time. Carpenter explains that there is a synthesis

of the concrete and the subjective aspects of musical time. She says: "musical time is a synthesis of the objective time of the work and the subjective time of the experience" (19). "Synthesis" denotes the combination of elements to make a new whole: those elements are the two categories of time that, when combined, generate a more complete notion of musical time.

Gisele Brelet also writes of a dialectic between two aspects of musical time: the "time lived" and the "time thought" (20). "Dialectic" is used here in a similar way to Carpenter's use of "synthesis." "Dialectic" implies an interaction of constituent elements. In this case, the dialectic is between two types of time coexisting in the idea of musical time: "time lived," the concrete aspect, and "time thought," the subjective aspect. Brelet stresses the idea that time lived cannot be left out of the experience of music and musical time. She writes that "music is a speculation on time, inseparable from an experience of a lived time" (21).

Susanne Langer, in a more general way than Stravinsky and Brelet, defines "virtual time" as a temporal category which can be created by any art, not just by music. She explains that the sounds relate to each other in virtual time, a time that belongs only to that relation between the

sonorous forms. She writes that:

> all music creates an order of virtual time, which its sonorous forms move in relation to each other- always and only to each other, for nothing else exists there (22).

When reading Kramer, Langer, Stravinsky, and Brelet a terminological similarity emerges: all the terms used represent a type of time that is created and measured by the subject when experiencing music, as opposed to a concrete time that cannot be created by the subject, and that can be measured objectively.

Scholars agree that there is a particular type of time that only relates to the experience of music. This category of time in music, "subjective musical time," is encountered only when the musical process takes place. It is a subjective domain because it depends entirely on the subject who experiences the musical work.

Subjective time can be experienced in any situation, in everyday life. Virtual time, as Langer calls it, is the subjective time that can be created by any art. But subjective musical time is the only temporal category peculiar to the subjective experience of music.

The terminological discrepancies found in the critical literature prompted me to reconsider the definitions given to these two categories of time as they interact in the musical process, and to try to find accurate names to describe them. The musical process, the association of a series of musical events toward a musical result, requires time. There are at least two categories of musical time interacting in that musical process: a type of time which is concrete and can be measured objectively; and a category of time that is entirely dependent on the subject who is experiencing that musical process.

I have tried to find terminology that takes into consideration all the concepts discussed in the critical literature consulted, and renders these concepts as clearly as possible. The best terms I could find to describe these two categories of time are "concrete musical time,"(23) and "subjective musical time"(24). "Concrete musical time" applies to the musical time common to all our activities, a time which can be measured objectively. "Subjective musical time" applies to that time that is specific to the experience of music, and which cannot be measured in a concrete manner. These two categories of time, interacting in the musical process, constitute what I call "musical time."

2. Kramer, Clifton and the Model of Musical Time

This section discusses on time and musical time in order to present a model of musical time and its categorization. This model is the result of examining writings by two scholars who address the matter of musical time in very different ways: Jonathan Kramer and Thomas Clifton.

Jonathan Kramer acknowledges the existence of two categories of time, "objective time" and "musical time." He writes: "musical time and ordinary time lead parallel existences" (25), which indicates the differentiation between two types of time that coexist. Another example is Kramer's assertion that "deep listening does give primacy to musical time" (26). If one category is given primacy over another, there must be a distinction between the two categories: time that is common to all activities (including music), the "ordinary time"; and time that is specific to the "deep listening" experience of music, "musical time." Kramer confirms this idea by asserting that "musical time differs quite drastically from ordinary time" (27), and that "we simultaneously experience musical time and absolute time" (28).

A problem arises because Kramer does not use his

terminology to represent the two subcategories of time, concrete and subjective, which coexist in the category of musical time. In particular, he does not designate with proper terminology that type of musical time, which has similar characteristics to ordinary time, which I have called "concrete musical time." Kramer explains that ordinary time is not interrupted when the experience of music takes place. But he discusses ordinary time separately of musical time, and he does not give a name to the ordinary time that is present in the musical process.

Kramer's "ordinary time" and "musical time" do not represent an interaction between the two subcategories of musical time. "Ordinary time," as it is used by Kramer, does not convey a direct relation to the musical experience. "Musical time" does not indicate which of the two types of time interacting in the musical process (concrete or subjective) is being examined.

Thomas Clifton, unlike Kramer, acknowledges in his writings the existence of two types of time interacting in the musical process. He does not, however, give names to these. Clifton asserts that "there is a distinction between the time which a piece takes and the time which a piece presents or evokes" (29), and that "the performance of a piece unfolds chronologically: it takes time" (30), but

also "time is a relation between a person and an experienced event [in this case, a musical piece]" (31). I equate these two categories with my categories "concrete musical time" and "subjective musical time." For Clifton, the time a piece takes and the time a piece evokes are related in the understanding of music, and we experience both in the work's musical time.

The problem that arises from Clifton's writings is the lack of consistent terminology to designate the two subtypes of time, concrete and subjective, as related to the musical experience. Clifton, like Kramer, acknowledges the existence of a certain type of concrete or objective time, "world time" as Clifton calls it, which is used by the arts to develop and to create their own, distinct artistic time, in this case, musical time. But Clifton rejects the term "objective time" as a concept completely external to the subject. He would not discuss a concrete or objective musical time.

Clifton, a phenomenologist, explains that a discussion of "objective time" implies a contradiction. He asserts that this categorization of time suggests that there is a time external to us, a time that exists without taking into consideration the human being, and, consequently, it also suggests that we perceive time through some kind of

sensation. Clifton says:

> objective time is a contradiction in terms. It presupposes the existence of a time which exists independently of us, and of a time sense whereby the person perceives this time (32).

He also explains that we cannot measure a sensation, with a clock. He asserts that "it is useless to measure the sense of time against a clock which is alleged to keep real time" (33).

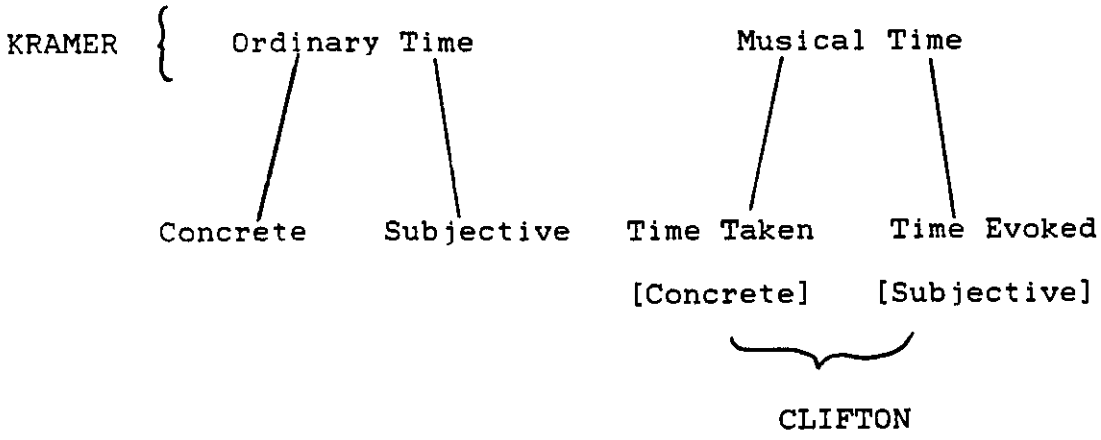
These two assertions do not come as a surprise, because of the school of thought Clifton belongs to. For phenomenologists, the subject and his experiences are the center of phenomenological description. From the phenomenologists' point of view, time does not exist independently of the subject.

In this thesis I take the position, alongside Stravinsky, that there are temporal social conventions which exist autonomously from the experiencing subject, which can be taken as concrete or objective. These temporal conventions are used by music to unfold, deriving in concrete musical time. This category of time, concrete musical time, is capable of measurement, and it is separated

from the subjective, personal experience of musical time. As I stated in this chapter, this type of musical time can be compared to different concrete standards, such as clock time, or musical tempi. Let us recall the example of the comparison between tempi, and their identification as a concrete aspect of the musical performance.

As we can conclude from all the above, two representative scholars, Thomas Clifton and Jonathan Kramer, adopt different categorizations of time and musical time. The following chart shows these categorizations.

Model



There are two broad categories of time, and four

subcategories. The broader categories are ordinary time and musical time; these are the two categories clearly acknowledged by Jonathan Kramer. Ordinary time and musical time are each divided into two subcategories. In his writings, Thomas Clifton addresses the concrete and subjective subcategories under musical time, but he does not use these terms to distinguish them. The two subcategories of ordinary time, concrete and subjective, are beyond the scope of this thesis.

In chapter three, I shall present recording technology, and its relationship to the two categories of musical time presented here. A discussion of recording technology is necessitated by the fact that every aesthetic aspect of music has been challenged by the appearance of recording technology. Musical time, as an aesthetic musical element, needs to be analyzed in light of this new technological advancement.

References

1. Barbara Barry's explanation of the term "musical time" is one example of the difficulty encountered when attempting to involve the two categories of time in the definition of this concept.
2. See Susanne Langer, Feeling and Form (New York: Charles Scribner's Sons, 1953), 111.
3. See Jonathan Kramer, The Time of Music (New York: Macmillan, Inc., 1988), 161.
4. Ibid., 151.
5. Thomas Clifton, Music as Heard (New Haven: Yale University Press, 1983), 81.
6. Barbara Barry, Musical Time, the Sense of Order (New York: Pendragon Press, 1991), 5.
7. Igor Stravinsky, The Poetics of Music in the Form of Six Lessons (Cambridge: Harvard University Press, 1975), 30.
8. Ibid, 31.
9. Micheline Sauvage, "Notes on the Superposition of Temporal Modes in the Works of Art," Reflections on Art (New York: Oxford University Press, 1961), 162. The matter of different artistic temporal categories is discussed in chapter one.

10. The subject of time perception can be understood by consulting, among others, The Psychology of Time by Paul Fraisse (New York: Harper & Row, 1963), The Personal Experience of Time edited by Bernard Gorman (New York: Plenum Press, 1977) and the article by Sue Pedri and Beryl Hesketh "Time Perception: Effects of Task Speed and Delay" appeared in the journal Perceptual and Motor Skills 76 (1993), 599-608.
11. Kramer, The Time of Music, 327.
12. Ibid., 7.
13. Ibid., 165.
14. Joan Stambaugh, "Music as a Temporal Form," The Journal of Philosophy 61, no.9 (April, 1964): 265-80, 268.
15. Barry, Musical Time: the Sense of Order, 8.
16. Stravinsky, Poetics of Music, 30.
17. Ibid.
18. Stravinsky writes that:

    > all music, whether it submits to the normal flow of time, or whether it disassociates itself therefrom, establishes a particular relationship, a sort of counterpoint between the passing of time, the music's own duration, and the material and technical means through which the music is made manifest (Ibid., 30.)

19. Patricia Carpenter, "Musical Form Regained", 39.

20. Gisele Brelet, Le Temps Musical (Paris: Press Universitaires de France, 1949), vol.1, 35.
21. Ibid.
22. Langer, Feeling and Form, 109.
23. Concrete: "opposed to abstract; characterized by immediate experience of realities whether physical things, sensations, or emotions; belonging to or standing for actual things or events; not abstract or ideal." In Webster's New International Dictionary, 3rd ed., s.v. "concrete."
24. Subjective: "of, relating to, or being whatever in experience or knowledge is conditioned by merely personal characteristics of mind or by particular states of mind as opposed to what is determined only by the universal conditions of human experience and knowledge." In Webster's New International Dictionary, 3rd ed., s.v. "subjective."
25. Kramer, The Time of Music, 7.
26. Ibid., 3.
27. Ibid.
28. Ibid.
29. Clifon, Music as Heard, 81.
30. Ibid., 81.
31. Ibid., 114.
32. Ibid., 51.
33. Ibid.

Chapter III

Recording Technology and its Impact on the Musical Aesthetic Ritual

This chapter contains a discussion of recording technology and the changes it imposes on the musical aesthetic ritual. The new recording technology introduced at the end of the last century greatly influenced and still influences the musical experience and its rituals: the way composers write music, the way interpreters perform music, and the way audiences listen to music. The musical experience and its rituals are transformed by the new technological advancements. In this thesis I concentrate mostly on the listener's experience of music, and on how the rituals are transformed from the listener's viewpoint. Future work can be done to analyze in greater detail those changes as they affect both composers and performers.

At this point, we cannot deny the importance of recording technology in music. The new technology affected and still affects our lives as professional musicians, or simply as consumers of music. The extent of the effect the

new technology has made on music has yet to be explored because of its magnitude (1).

One of the important effects of recording technology is the change in the musical aesthetic ritual. As we shall see in this chapter, the rituals as they are performed in the concert hall are challenged by the new technology, and must be examined in order to determine how they are altered. Many facets of the concert hall ritual, such as attendance at a concert hall, preparation for the concert, interaction between audience and performer, exclusivity to a group, and inviolability of live music are examined in light of the new technological advancement.

The technology of the reproduction of works of art and the consequent alteration of the aesthetic rituals associated with works of art generate great changes with regard to aesthetic ideas of all arts, including music. Those changes generated by the technology of reproduction must be taken into consideration for a better understanding of the art and the aesthetic ideas being studied. Therefore, to better comprehend a specific art and the influence of technological reproduction on that art, we need to examine the aesthetic ideas in light of this new variable (2). When discussing recording technology and its influence on music and on musical aesthetic ideas, Jonathan Kramer asserts that

"recording technology has forced us to reconsider what constitutes a piece of music" (3).

In the context of musical time, I must first look at the changes in the musical aesthetic ritual derived from technological advancements, in order to study how they influenced certain aspects of music. I will pay particular attention to the impact of changes in the musical aesthetic ritual involving the ideas of musical time already expressed in chapter two.

This chapter comprises a discussion of recording technology and the changes imposed on the musical aesthetic ritual. It is divided into three sections. The first section presents a brief summary of the most important events related to the manipulation of recorded sound. The second section defines in more detail the terms "ritual" and "musical aesthetic ritual." The third section discusses the changes the new technology imposes on different aspects of the musical aesthetic ritual.

1. Manipulation of Recorded Sound as a Consequence of the Advancements in Recording Technology

This section is concerned with the history of

recording technology, and the consequent potential manipulation of sound. It briefly describes the first breakthroughs in recording technology, from Edison to the 1940's, and then concentrates on the most important aspect of recording affecting the concept of musical time: the potential manipulation of recorded sound, made possible by the invention of the tape and the tape recorder.

i) Origins of the recording industry

Recordings of music were made beginning in the second half of the last century. In 1877, Thomas Alva Edison invented the cylinder phonograph. In 1894, Emile Berliner started making discs, which had the advantage of being more easily manufacturable than cylinders. Soon after, the Gramophone company, started by Berliner, established branches in London, Berlin, and France. Most of Europe's recording industry was started by Berliner's representatives. In the United States, Berliner's branch was to turn into the Victor company.

By the beginning of this century, recording industries had been established in Germany, Austria, Russia, and Spain, but the technical ideas and the equipment were imported from America. Around 1900, recording technology was established both as a way of reproducing musical works, and

as a way of editing recorded sound.

Beginning in 1902, Victor raised cultural expectations with its Red Seal series, which featured Enrico Caruso. By 1910 the majority of record sales were of classical music. Caruso's discs were a major factor in the transformation of the phonograph into a cultural phenomenon. Between 1907 and 1910 another company, Columbia, tried to approach Victor's cultural prominence by releasing records from Europe, and by recording different operatic singers. Columbia also started fabricating double-sided discs; Victor did not do so until 1923.

In the 1940s, two major inventions improved the way in which music was processed and recorded: the long-playing (LP) record and the tape recorder. The LP opened up a new market for both new consumers of recorded music and older record collectors who were willing to repurchase their collections as LPs. The development of the tape had a major impact on recording because anyone who owned a tape recorder and a microphone could record sound. This was impossible before the appearance of the tape because of the machinery required.

ii) The tape, the compact disk, and the potential for the manipulation of sound

The development of the tape recorder in the late 1940's had another crucial impact on the record industry: the ability to alter and manipulate recorded sound. For the first time, audio engineers had the ability to splice together discontinuities into artificial continuities. Composers of 'musique concrete' profited from this technological advancement: it allowed them to work directly with sounds and continua, without performance.

The ability to alter and manipulate recorded sound means that recorded material could be fragmented and spliced together, combined, deformed, and distorted, among other options. One of the most common procedures, the fragmentation and splicing of pieces from a recorded tape, allows the assembly of any succession of sounds.

Another process that allows the alteration of recorded sound is the combination of different pieces of recorded material. This is achieved by superimposing and playing into a mixer different strands of material recorded on parallel tracks. The result is re-recorded on another track or another tape recorder. This procedure is called multi-track recording. There are different formats for

multi-track recording, depending on the number of channels used: four, eight, or sixteen track recording.

The potential deformation and distortion of sound, made available by the tape recorder, involves countless possibilities. For example, we can change the playback speed of a tape. This procedure affects the frequency and duration of the sounds recorded. Tapes can be played backwards, which gives very particular results: one result is the conversion of fading sounds into abrupt crescendos. Recorded sound can be processed by additional devices, such as filters, reverberators, and modulators.

In the late 70s two major companies, Philips and Sony, agreed to collaborate on the design of a compact disc system. The audio technology is then dramatically altered by the introduction of changes in three fundamental design criteria: first, digital data is used to store and process the audio signal; second, error correction is employed to make the stored data more robust; and third, the compact disc system uses an optical, non-contact pickup.

In 1983 the compact disc system was introduced in the United States. More than forty companies, including the major labels, adopted primarily digital techniques for their new releases. Many advantages are brought by the compact

disk system, including the lack of degradation from repeated playings, the immunity to aging and temperature problems, the possibility of a longer playing time, the programmability of tracks, and the low manufacturing costs.

All the technological changes presented in this section, and especially the ability to alter sounds, constitute a turning point in the history of recorded music. These facts changed the way sound and music are processed forever. Technological advancements determined that the experience of music would never be the same, because of the new possibilities and alternatives available.

The ability to listen to a recording of a piece, instead of having to attend a live performance, radically altered an essential aspect of the musical experience, which I shall call the "musical aesthetic ritual." This change in ritual demands that our concept of musical process and our concept of musical time be reexamined.

2. Definition of the Terms "Ritual" and "Musical Aesthetic Ritual"

Explanations of the terms "ritual," and "aesthetic ritual," are required, since these terms are

given many different meanings, and can become confusing if not properly defined. Each of these terms can be understood in different ways, depending on the object being studied, and depending on the school of thought being consulted. To define "ritual" and "aesthetic ritual," I rely on the writings of Robert Bocock and Edmund Leach, since I found the interpretations of these scholars to be the most precise.

i) "Ritual"

Edmund Leach in his definition of "ritual" explains that the terms "ritual" or "ceremony"

> have been used interchangeably to denote any noninstinctive predictable action or series of actions that cannot be justified by a 'rational' means-to-ends type of explanation (4).

Other scholars use the term "ritual" to denote symbolic actions with a reference to supernatural beings, such as religious rituals, and the term "ceremony" for secular rituals, such as political, aesthetic, or life-cycle rituals. I use Leach's broad sense of the term "ritual" here to cover all types of rituals and ceremonies, making clear what type of ritual I am referring to. For example, when

referring to a ritual that involves the arts, I call it an aesthetic ritual.

We can define ritual as putting conventional, agreed-upon bodily actions to rational, social ends to communicate a certain message. Leach defines ritual actions as actions which cannot be justified by a "rational means-to-end type of explanation." I shall define ritual as an action that leads to a rational end, when the action or actions involved in that ritual lack a rational basis, and stem from emotion. Here I am following Robert Bocock who says that "ritual can integrate bodily feelings and emotions with rational social purposes" (5). As an example, we can think of the ritual of clapping when a concert is about to begin, or at the end, but not between movements. The customary action of clapping is an expression of pleasure and thus emotional preparation, and recognition for the artists and their work. It does not have a purpose in itself, but it has a rational social end: to establish the beginning or the end of the performance.

Bocock defines the term ritual as "the symbolic use of bodily movement and gesture in a social situation to express and articulate meaning" (6). The concept of symbol used by Bocock follows Susanne Langer's interpretation. She explains that a symbol related to a ritual is a

representation of the emotion conveyed in a conventional or customary expressive act, an act which lacks "inner momentary compulsion." Langer writes:

> As soon as an expressive act is performed without inner momentary compulsion it is no longer self-expressive; it is expressive in the logical sense. It is not a sign of the emotion it conveys, but a symbol of it; instead of completing the natural history of a feeling, it denotes the feeling and may merely bring it to mind, even for the actor. When an action acquires such a meaning it becomes a gesture (7).

Following Robert Bocock, we could say that there are two characteristic elements in a ritual action: conventional body movement and gesture, and the social situation. The conjunction of the two elements gives meaning to the ritual action, and lends it an end or purpose.

Ritual actions can be related to different symbols such as images, pictures, altars, and artistic performances. Those social bodily actions serve to communicate a message, related to a certain symbol.

We find many different types of rituals in our lives. We may think of religious rituals as one example but,

as Bocock explains, there is a large amount and a great variety of ritual action in our society (8). From shaking hands to congratulating someone on his birthday, different societies get involved in different ritualistic actions. A person participates in countless rituals; the quantity and quality of those rituals depend on the social and cultural environment.

ii) Aesthetic Ritual

Robert Bocock uses the term aesthetic ritual to denote rituals involving arts as symbols, where the symbols are of an aesthetic type. He writes:

> All activity which involves viewing and appreciating the arts is aesthetic ritual action, in that a group of people, or separate individuals, relate to symbols of an aesthetic type. At bare minimum this is ritual action, as distinct from action of a rational, technical kind (9).

In the case of rituals involving artistic expressions, the symbols are the different works of art: a musical piece, a painting, or a sculpture can become a symbol to which people relate.

Activities involving different arts and their experience involve different ritualistic actions, related to that particular art. Painting, for example, involves a person who produces the work of art, and a person who looks at it. Unlike painting, the performing arts involve an artist or artists who perform, and a social group, an audience, which responds to the work. Bocock distinguishes between painting and the performing arts in this way:

> [Paintings] are of less importance for social groups, they are usually now produced by one person, and looked at by the individual, or even purchased by a person for himself and his family. The so-called performing arts involve groups of artists to perform them, and they involve a social group, an audience, to be responsive to them, and to co-operate with the actual performers in enacting the work. The group processes involved are of some interest in themselves, and in their effects on the works of art performed and written.

Bocock also explains that there is a particular aspect of the ritual in the performing arts that does not exist in other arts. This aspect is the interrelation or connection between the audience and the performer or performers. There exists an interrelation already

established between the audience and the composer, but the connection between the audience and the performer implies something different. Bocock asserts that if people from the audience do not establish that particular emotional connection with the performer or performers, a sense of disapproval could result. He writes:

> An audience builds up an emotional rapport among its members, and between itself and the performers of the aesthetic ritual. There is a sense of irritation with members of an audience who will not make the necessary emotional connection with the others and with the performers, in a theatre or a concert, especially when this results in outwardly expressed action, such as talking in the 'wrong' places, sleeping or scowling (10).

We should define different terms for the different arts to make clear what aesthetic symbol or symbols we are referring to. As I pointed out earlier, aesthetic rituals involving paintings as symbols will differ from rituals involving musical works. Therefore, for my purposes, I shall use the term "musical aesthetic ritual" to denote those ritualistic actions involving music (11).

iii) Musical Aesthetic Ritual

A musical performance can have particular ritualistic aesthetic qualities regardless of the content of the work being performed. In the example of the clapping of hands at the beginning of a concert, the audience would applaud at the beginning of a performance of a work by Bach, Chopin, or Berg. Robert Bocock alludes to this conventional characteristic of the musical aesthetic ritual which is independent of content when he writes:

> making and listening to music is the ideal-type form of aesthetic ritual, for groups meet to relate to a symbolism which has a unique aesthetic quality. It can be related to political or religious ideas, but it retains a life of its own, independent of the content of any works associated with it (12).

We find many ritualistic actions involved in the aesthetic experience of music. The ritualistic action of clapping, for example, entails both physical and emotional preparation, as well as audience participation in a concert performance. In fact, the action of attending a concert performance is a ritual action in itself. As we shall see in the next section, recording technology radically altered

this aspect of the musical aesthetic ritual in particular.

3. Changes in the Musical Aesthetic Ritual with the Appearance of Recording Technology

The advent of recording technology has drastically modified the musical aesthetic ritual. The ritualistic actions of the concert performance must be reexamined to determine how they have adapted to the new technology. In this section I shall point out some ritualistic actions as they are performed in the concert situation, and how they can be altered when the music is experienced through a recording. Changes in the physical environment in which music is performed and listened to (ritual in the concert hall), changes in physical and emotional preparation as a fixed condition for the musical experience (ritual in preparation for the concert experience), audience participation (ritual interaction of audience and performer), the exclusionary nature of the live performance, availability (ritual of consumption) and, finally, the potential alteration of recorded sound (ritual inviolability of live music) are presented.

As we shall see, the alteration of the rituals as they are performed in the concert hall leads to the

potential manipulation of certain musical aspects, such as the potential manipulation of musical time.

RITUAL ATTENDANCE AT THE CONCERT HALL

Regarding the alterations of aesthetic rituals, Walter Benjamin explains that with the appearance of mechanical reproduction of works of art, the public is no longer slave to one way of experiencing art. He writes:

> for the first time in world history, mechanical reproduction emancipates the work of art from its parasitical dependence on ritual (13).

Music is no exception to this assertion: with the appearance of recording technology as the means to mechanically reproduce the musical work of art, the listener no longer has to experience the musical work only in a concert situation.

Recording technology allows the abolition of certain ritualistic actions. Glenn Gould explains that the experience of music ceased to be something fixed, something approximating a religious ritual. He writes:

> within the last few decades the performance of music has ceased to be an occasion, requiring an excuse and a tuxedo, and accorded, when encountered, an almost religious devotion (14).

Gould writes of the abolition of the rituals associated with live music, which dictated that music could only be experienced in one way: as an event encountered only in the concert hall.

From the performer's perspective, as Glenn Gould explains, we also find that the new technology allows for a more intense analysis, and for a wider range of repertoire. He asserts that the recording studio gives the performer the possibility to encounter a bigger variety of repertoire, and that repertoire can be much better analyzed in a recording studio than in a concert situation. He writes:

> the performer is inevitably challenged by the stimulus of this unexplored repertoire. He is encouraged by the nature of studio techniques to appropriate characteristics that have tended for a century or two to be outside his private preserve. His contact with the repertoire he records is often the result of an intense analysis from which he prepares an interpretation of the composition.

> In the course of a lifetime spent in the recording studio he will necessarily encounter a wider range of repertoire than could possibly be his lot in the concert hall (15).

From the composer's perspective, there are also many advantages brought about by recording technology. Glenn Gould explains that the new technology gives the composer the possibility to record his own work, and this gives an indisputable performance of the work. He writes:

> the new composer has an advantage totally denied to his predecessors: the possibility of recording permanent and authoritative performances of his music, performed by him or by someone else under his guidance. Presumably a composer's performance of his own work will settle all questions arising out of the ambiguities of staff notation. If, subsequently, a performer needs to know exactly how the composer wanted a certain passage to be played, he can listen to the composer's own recording (16).

Coming back to the listener, there are many ritualistic actions in a concert situation. We can think of ritualistic behaviors, such as remaining seated during the

performance, not coughing, and clapping at the beginning and at the end of a piece. The shared concert experience, and the communal identity among the participants in the audience, are part of the ritual in the concert hall.

With the advent of recording technology new listening spaces are created; therefore, the ritualistic actions as they appear in the concert hall are replaced by new ritualistic behaviors. The aspects of the ritual in the concert hall cited above are replaced by the rituals belonging to the new spaces. The latter rituals are created by the listener of recorded music.

With the new technology, the person willing to experience music does not necessarily have to comply with the aesthetic ritualistic action of attending a live performance of a musical work, which was impossible to avoid before the appearance of the recording technology. The new recording technology allows the possibility of creating new spaces in which new rituals, different from the ones presented in the concert hall, can be established.

RITUAL IN PREPARATION FOR THE CONCERT

There is a certain physical and emotional

preparation which is part of the musical aesthetic ritual in the concert hall that drastically changed with the appearance of recording technology. As Robert Bocock explains, the concert hall assumes that people are "'going out', dressing up for the occasion, and experiencing a break in normal routine as a result" (17). A sense of expectation is also part of the ritual of preparing to attend the concert hall.

Before the advent of recording technology, the ritualistic actions discussed above were accepted as fixed conditions of the musical experience. Some of these ritual behaviors are different from the ritual actions performed to listen to recorded music: dressing up and 'going out' to listen to a live performance of a musical work, are no longer fixed conditions in the experience of music. Dressing up and going out can be substituted by dressing down while listening to recorded music.

The break in normal routine, as Bocock calls it, does not apply when we experience recorded music because, thanks to the new technology, we can be listening to music even without having chosen to do so. With the appearance of recording technology, and especially with the latest technological advances, music is part of everyday life rather than a break in normal routine.

The ritual preparation for listening to recorded music is not the same as the ritual performed to go to the concert hall. It involves a completely different aspect of behavior: going to a store and purchasing the recording of a musical work. The ritual of physical preparation for going to the concert hall is replaced by different physical ritualistic actions which are part of a new ritual preparation for the experience of recorded music. These ritualistic actions will differ greatly from person to person.

RITUAL INTERACTION BETWEEN AUDIENCE AND PERFORMER

Another change in the musical aesthetic ritual involves audience participation in the performance of music. As Robert Bocock explains, the performing arts involve two groups of people: the artists performing the works, and the audience responding to them, co-operating with the actual performers in enacting the work of art (18). The visual, as well as the aural, communication between these two groups is part of the musical aesthetic ritual. The ritual interaction of audience and performer is characterized by the performer receiving immediate feedback from the audience.

This interaction between performers and audience altered dramatically with the appearance of recorded music: no audience is able to co-operate in enacting the work, at least in the presence of the performer, and no audience is able to build up an immediate emotional rapport between itself and the performers when listening to a recorded musical piece.

Glenn Gould also writes about the interaction between performers and audience in the concert situation. He asserts that the custom of applauding at concerts should be abolished because it yields the audience a false sense of participation in the performance, and also because the performer might be inclined to perform in a way that would please the audience. Glenn Gould writes:

> applauding gives the audience a false sense of active participation in the occasion. Applause misleads performers, luring them into crowd-pleasing tricks of interpretation and personal display. So long as a performer's primary motive is personal display, he cannot give more than secondary attention to the music he is performing (19).

With the new recording technology the immediate

feedback available in the concert situation is replaced by different forms of response. For example, the number of recordings purchased and critiques of those recordings are forms of feedback which the listener of recorded music presents to the performer of recorded music.

In the experience of recorded music there is neither instant audience participation in the musical process, nor direct interaction between performer and audience. The interaction between performer and audience was a fixed aspect of the musical aesthetic ritual before recording technology appeared as an alternative to experiencing live music.

RITUAL OF CONSUMPTION

Another change in the musical aesthetic ritual involves the exclusivity of the group listening to the piece. In the case of a live performance, a limited number of people are allowed to enter the hall and listen to one performance of a musical work. When the work is recorded, there is no limit to the number of people who can listen to the piece. The product can be consumed by anyone interested in it, and it can be experienced as many times as the listener pleases.

One of the fixed characteristics of the ritual of live music, restricted access to the performance, is replaced by availability. The musical experience ceases to be a rare and atypical event; it becomes an object available to be consumed by anyone. As Jacques Attali explains, the spectacle of a work's performance is just one way of listening to a musical work. With the advent of recording technology, repeatability and availability are new ideas concerning ways of approaching the musical experience. Attali also asserts that with the new technology, the musical experience loses its fixed ritualistic character of uniqueness. He writes:

> a work that the author perhaps did not hear more than once in his lifetime becomes accessible to a multitude of people, and becomes repeatable outside the spectacle of its performance. It gains availability. It loses its festive and religious character as a simulacrum of sacrifice. It ceases to be a unique, exceptional event, heard once by a minority (20).

Of course, we have to recognize that, in some special cases, there can be limited releases of an album, in which case the availability to the consumer will be restricted.

Glenn Gould asserts that recording technology gives the record owner the possibility to own recordings of all musical styles at once, something impossible to achieve without the new technology. He writes that

> recordings create in every man's library both a concert without halls and a musical museum whose curator is the record owner; therefore, all known musical styles-indeed, all kinds of music- are, thanks to records, available to the record owner at once (21).

RITUAL INVIOLABILITY OF LIVE MUSIC

The musical aesthetic ritual of the concert hall involves one crucial aspect that differentiates it from the musical aesthetic ritual of recorded music: the inviolability of sound. When we attend a live performance, we know we are hearing the pure, unaltered sound; we are attending the definitive performance of the work.

This ritual inviolability of live music did not allow performers to, as Gould explains it, "explore the limitless possibilities of the recording medium" (22). The performer had to sacrifice the clarity and liberty of trying

different interpretations of the same piece. This lack of liberty found in the ritual inviolability of live music also pressured the performer to preoccupy himself with matters such as mistake-free interpretations.

These aspects of inviolability found in the musical aesthetic ritual of the concert hall were replaced by the ability to alter and manipulate recorded music. With the new technology, the definitive version of a piece can be achieved through different techniques, such as the cutting and splicing of many alternate takes. This allows the performer to offer the best performance of a musical work.

The listener can also take advantage of the changes in the ritual inviolability of live music. With the new recording technology, the listener acquires a new power over the music s/he listens to. Now the listener can control the musical experience by deciding whether to alter it or not. These alterations may include, for example, the splicing of different movements of a sonata recorded by different performers.

A new freedom is made available to the consumer, thanks to this newly acquired power: the listener can now manipulate the recorded sound at will. Not only is the alteration of the recorded sound possible with the new

technology, but also concrete aspects of the musical piece, such as completeness and temporality, can be manipulated freely. This is the crucial change that affects the idea of musical time, as I shall explain in the next chapter.

Paul Theberge writes of the changes experienced with the appearance of recording technology. He presents Glenn Gould's ideas on the subject, and their relation to Marshall McLuhan's thoughts about media (23). When discussing the new powers acquired by the listener with the appearance of recording technology, he explains that the new technology yields a new control to the listener, including the ability to modify certain aspects of the musical recording, something impossible to accomplish in the concert hall experience. He writes:

> whereas the concert hall presents the listener with an experience over which s/he has no control, the modern system allows the listener to subtly modify the dynamic, timbral and spatial balance of a musical recording (24).

Taking into consideration the new powers obtained by the listener with the new technology, we can say that the ultimate performance of a musical piece is the one made by the listener. Splicing and modifying the existing recording

at will makes the listener the final editor of the musical work as he or she wants to hear it and experience it. These changes in the existing recordings cannot affect, however, the performer's projection of emotional content in the recorded work (25).

As we can see, the change in the ritual inviolability of live music allows a new freedom to both performer and listener to manipulate and alter music. These changes open the door to a reexamination of some aspects of music challenged by this potential manipulation.

As I noted earlier, recording technology and the change in different aspects of the musical aesthetic ritual require us to rethink those musical aesthetic ideas in light of the new situation. Therefore, in the next chapter, I will concentrate on the effects of the variations in the musical aesthetic ritual on certain aspects of music, such as originality, repetition, completeness, and, most thoroughly, musical time.

References

1. Glenn Gould, "The Prospects of Recording," High Fidelity 16, no.4, (April 1966): 46-63.

   This article gives a good sense of the musician's views regarding the relevance of recording technology to music. In this article Glenn Gould, a performer and editor of recordings, discusses his own ideas and personal experience on the subject. He also presents his and other thoughts regarding the influence of recording technology on many aspects of the musical life, not just the performance aspect.

2. Technological reproduction of different artistic expressions is too broad a subject to be discussed here, but as examples of writings which could be consulted on this matter, I can cite Roman Ingarden, Ontology of the Work of Art (Ohio: Ohio University Press, 1989); Andre Malraux, "Sketch for a Psychology of the Moving Pictures," Reflections on Art (New York: Oxford University Press, 1961): 317-27; Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," Illuminations (New York: Schocken Books, 1968): 217-51. For some ideas regarding the media, its message, and its

influence on public, I can cite Marshall McLuhan Understanding Media (New York, Toronto, London: McGraw-Hill Book Company, 1964.)

3. Jonathan Kramer, The Time of Music (New York: Macmillan, Inc., 1988), 67.
4. International Encyclopaedia of the Social Sciences, s.v. "ritual."
5. Robert Bocock, Ritual in the Industrial Society (London: George Allen & Unwin Ltd., 1974), 37.
6. Ibid., 37.
7. Susanne Langer, Feeling and Form (New York: Charles Scribner's Sons, 1953), 123, cited in Bocock, 36.
8. Bocock, 35.
9. Ibid., 149.
10. Ibid., 150.
11. Ibid., 149. In this section, Bocock explains the ritualistic actions involved in the visual as well as in the performing arts. He asserts that for painting, for example, the need for a social group is less important when we compare it with the so-called performing arts, where the involvement of groups, either performing or responding, is crucial.
12. Ibid., 166. Regarding the matter of symbolism in music, Susanne Langer explains that if the significance of music is based on emotional content, it is because of the symbolism related to it. She also writes that

music expresses feelings through the symbols used. Examples of musical symbols are sound, intervals, musical ideas, form, and rhythm. All this musical symbols combined have the particular aesthetic quality of creating the symbolism in music. This discussion is found in Susanne Langer's Philosophy in a New Key (New York: Mentor Books, 1953), chapter 8.

13. Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," Illuminations (New York: Schocken Books, 1968): 224.
14. Gould, "The Prospects of Recording," 48.
15. Ibid., 50.
16. Geoffrey Payzant, Glenn Gould, Music & Mind (Toronto: Van Nostrand Reinhold Ltd., 1978), 27.
17. Bocock, Ritual in the Industrial Society, 152.
18. Ibid., 150. Bocock asserts that the audience builds up an emotional rapport among its members and with the performers, and when that emotional connection is not achieved among the majority of the members of the audience, there is a sense of irritation.
19. Payzant, 24.
20. Jacques Attali, The Political Economy of Music (Minneapolis: University of Minnesota Press, 1985), 100.
21. John McGreevy, Glenn Gould (Toronto: Doubleday Canada Limited, 1983), 133.

22. Paul Theberge, "Counterpoint: Glenn Gould & Marshall McLuhan", 113.

23. Paul Theberge, "Counterpoint: Glenn Gould & Marshall McLuhan," Canadian Journal of Political and Social Theory 10, no. 1 (1986): 109-27.

24. Theberge, "Counterpoint: Glenn Gould & Marshall McLuhan," 119.

25. In this regard Aaron Copland once said:

> "the listener does eventually come to the point where he makes the ultimate performance by splicing tapes from other musician's recordings" ("The Prospects of Recording," 60.)

Chapter IV

Manipulation of the Recorded Sound and its Effects on Certain Musical Aesthetic Ideas, with Emphasis on the Concept of Musical Time

Musical time, regarded as an aesthetic musical idea, cannot be considered as properly defined without taking into consideration the technological advances of recording, and the challenges those advances impose on the definition of this concept. Therefore, I shall resume the task started in the first and second chapters of this thesis: studying the idea of musical time as one of the constituents of the musical piece. Other musical aspects related to the notion of musical time such as the reproduction and completeness of the musical work will also be examined.

This chapter discusses the two types of musical time presented in chapter two, concrete and subjective, in terms of recording technology. The advent of recording technology has had a great effect on the concrete aspect of musical time. However, recording technology does not affect the subjective aspect of musical time as dramatically as it

does to the concrete musical time of the piece.

The first part of this chapter concentrates on the influence recording technology has had upon the alteration of three musical aspects: the reproduction of the musical work, the completeness of the musical form, and the temporality of the musical work. The second part of this chapter presents the discussion between Joan Stambaugh and Patricia Carpenter on the interrelation of temporality and form. It also analyzes the influence of recording technology on concrete and subjective musical time.

1. Influence of Recording Technology on Certain Musical Aspects

REPRODUCTION

Technology yields a new freedom: the possibility of reproducing the same recording any number of times. When recording technology was not available, music had to be experienced in the time and the space in which it was performed. Only original performances were presented to the public; no reproduction of a performance was available. Today, the new recording technology allows for mass distribution of any recording. Large scale reproduction and

availability are new aspects of the musical experience.

Reproduction, the repetition or replica of an original musical work, has both a concrete and a subjective aspect. The concrete aspect involves the actual time, for example, the concrete time elapsed in the performance of the work. The concrete musical time of the work entails understanding music as a series of events unfolding chronologically.

The subjective temporal aspect of reproduction involves the subject's idea of the reproduction. The subjective aspect is the experiential part; it is not fixed in the way that the concrete temporal aspect is. The subjective temporal aspect of music involves the way the music is perceived, and with the relation between people and perceived events.

A discussion of recording technology gives rise to the question of truthfulness: are we listening to a truthful reproduction of the original? In terms of the concrete aspect of musical time, an original performance of a piece exists only in the recording session. A recording of that original will lack the truthfulness or fidelity of the original. No recording is able to capture all the aspects of an original performance. Also mechanical aspects such as the

use of defective playback equipment, or the distortion of sound should be taken into consideration as they greatly affect the fidelity to the original performance.

The concrete temporal aspect of reproduction can be characterized, for example, by the purchase of a recording. The moment the music is recorded to be reproduced, and to be played through any means of reproduction, it loses certain aspects of originality such as the concrete temporality of the original performance. We lose the time and the space of the original performance: we are not compelled to listen to the performance in real time, or in a concert space that cannot be manipulated by the listener. We can manipulate both the temporal and spatial aspect of a recording because we can listen to that recording whenever we want to and wherever we want to as long as we have the proper technical equipment to do so. We are no longer obliged to listen to music in real time or in the physical space in which it is performed. When we buy a recording we know that what we are going to listen to is not an original performance in this respect. We accept that it is a reproduction of the original concrete temporality as it was presented in the recording session. However, in subjective terms, the truthfulness or fidelity of the performance is not affected by its reproduction through recording technology in the way the concrete aspect is,

because of its subjective quality. The performance of the work will get to the listener in a certain way, and the listener will experience it subjectively, regardless of variations in the concrete aspect of its fidelity form the original performance.

Curiously, the subjective temporal aspect can be illustrated by the purchase of music recorded in a live performance. Subjectively, the listener might consider this recording as a live experience, with all the attributes of a live experience, even when a live performance can be perceived as being a live performance only in the time and space it occurs in. The listener will always regard the recording as a live performance, regardless of whether it is played in its entirety or not, or if it is played through headphones or another means of spatial presentation.

There are two aspects, then, to reproduction through recording technology: the concrete temporal aspect, which involves the actual time of the recording, and the subjective aspect, which involves the perception of the recording being experienced. Both aspects, as they are influenced by the new reproduction technology, are of importance to the replica.

For the concrete temporal aspect, the original

performance of the music, that is, the performance in the recording session, loses importance. The listener recognizes the fundamental difference between the concrete temporality of the original performance and the concrete temporality of the replica. The consumer, by choosing the recording, attributes less importance to the temporality of the original. Instead, the replica of that performance gains importance. For the consumer, the concrete temporal aspect of the replica becomes more important than the temporality of the original.

But in the subjective sense of reproduction, the experience of the piece of music is what is important; the means through which we experience the piece of music is not as important as the subjective musical experience itself. The consumer acquires a replica to preserve the subjective qualities of a certain performance, and to be able to enjoy it at any time.

While I maintain that the concrete and subjective components of reproduction are separate, other authors such as John Mowitt and Jacques Attali have not done so. The concrete aspect of reproduction, the importance of the temporality of the replica, has had certain ramifications upon what John Mowitt calls the "social audibility" of music. Mowitt, discussing the social aspects of the recorded

reproduction of music, explains that the repetition of recorded works constitutes the basis of musical audibility, that means, the basis of the listening experience itself. We are no longer listening, to any significant degree, to original or live concert performances. Recorded performances have taken the place of the live performance. Mowitt asserts that repetition of recorded music is found everywhere, and that the repetition of recordings is the base of our society's music audibility, its listening experience: "In the contemporary musical world repetition now constitutes the very threshold of music's social audibility" (1). This is correct if we compare the amount of recorded music we listen to with the amount of live music we encounter nowadays.

Jacques Attali also discusses the matter of repetition, by expanding on the historical aspects of reproduction and consumption. He confirms Mowitt's notion about the importance of the replica by asserting that, in the end, the original completely loses its importance and significance; the reproduction or copy becomes more valuable than the original. The subjective component loses its significance. He proposes that the original which he calls the mold has no relevance in itself; it is important just as another part of the final product. He writes:

> usage was no longer the enjoyment of present labors, but the consumption of replication. Reproduction, in a certain sense, is the death of the original, the triumph of the copy, and the forgetting of the represented foundation: in mass production, the mold has almost no importance or value in itself; it is no longer anything more than one of the factors in production, one of the aspects of its usage, and is very largely determined by the production technology (2).

Both Mowitt and Attali consider that the importance of the subjective constituent of reproduction is lost because of the relevance given to the copy. However, even when the reproduction of an original gains a certain social importance, the subjective musical experience remains as one of the important elements, regardless of whether the work is listened to through a live performance, or through any means of reproduction.

Another musical aspect to be influenced by recording technology is the completeness of the musical piece. As in the case of reproduction, both the concrete and the subjective aspects of completeness are challenged by the new technology.

COMPLETENESS OF THE MUSICAL PIECE

I shall define completeness of a musical work as the entire performance of the piece, from beginning to end not lacking any part: attendance in real time to the entire performance of a piece.

Completeness involves both a concrete and a subjective component. With regard to concrete completeness, and taking into consideration recording technology, there are two types of concrete completeness to the musical piece: the concrete completeness as it was presented by the composer, and the concrete completeness as a result of manipulation by the listener. Concrete completeness constituted or created by the listener involves rearranging the parts of the piece, which can differ from the arrangement presented by the composer. The subjective component of completeness can be identified by the subject's knowledge of the complete work: when we hear a part of a work, in our mind we have the idea of how the complete work sounds. We have either heard the work before, or we can speculate about the entirety of the work. Our subjective idea of the work's completeness may or may not correspond to the completeness the composer envisioned.

With the appearance of recording technology, the

concrete aspect of completeness as it is presented in the original becomes a characteristic that is no longer fixed in the musical work. The new technology allows us to alter entirely the concrete chronological succession of musical events. We now can change parts, or listen to half of a movement instead of having to attend to a complete performance of the work. In a concert situation, the listener is expected to attend to the complete performance of a work; therefore, no change to the concrete completeness is possible. But with the advent of recording technology, the listener is no longer obliged to listen to the complete performance. The listener is free to create a new concrete temporality.

Jonathan Kramer asserts that the new technology allows listeners "to regulate the musical continua they hear" (3). The musical continuum can be defined as the concrete chronological succession of musical events. Musical continua now depend entirely on the listener's judgement. With the new technology, the listener becomes the ultimate manipulator in the concrete chronological succession of musical events; therefore, the listener is the ultimate manipulator of the concrete completeness of the piece.

As outlined in chapter three, the possibility of altering recorded sound and the completeness of the musical

work has a great changing influence on the music aesthetic ritual. With the new technology the listener gains the freedom to choose whether to alter an aesthetic ritual that preserves closure. As Jonathan Kramer writes: "listeners are no longer slaves to a concert ritual that perpetuates closure" (4). While the musical aesthetic ritual in the concert hall makes the audience listen to the complete performance of a work, the consumer of recorded music can decide whether s/he wants to experience the complete performance of a piece or just a section.

The new recording technology, with the consequent change in the musical aesthetic ritual, liberates the listener from the concrete completeness of the musical work. Kramer asserts that it is precisely the change in the musical aesthetic ritual, due to the advent of recording technology, that yields this new freedom to alter both the listening experience and the concrete completeness of the musical work. He writes:

> the removal of music from the ritualized behavior that surrounds concertgoing struck a blow to the internal ordering of the listening experience. An overriding progression from beginning to end may or may not be in the music, but the listener is not captive to that completeness (5).

Recording technology does not affect the subjective completeness of the musical work. The subjective completeness is constituted by the listener regardless of the concrete temporal succession, and regardless of the means of reproduction. The subjective experience of the musical work's completeness will not depend on the means by which the music is listened to; it will not depend on whether the music is experienced live or as a recording. Conversely, the listener can replace the concrete completeness of the work through its manipulation. This new concrete completeness will depend on the subjective experience of the work.

When we take into consideration the technology of musical reproduction, the concrete aspect of completeness is no longer a musical characteristic which can be taken for granted as it is presented in the original. This means that the concrete completeness of the piece can be manipulated at will by the listener. Thanks to the appearance of recording technology, and the change in the musical aesthetic ritual, the concrete completeness of the musical piece, and the musical form are domains transferred to the listener as potential manipulator of the recorded work.

TEMPORALITY

The musical temporality of a piece is influenced by recording technology in different ways which must be analyzed separately in order to arrive at a more comprehensive way of understanding how technology influences concrete and subjective musical time. Firstly, with the experience of music through recording technology, concrete musical time is affected by the lack of the actual presence of the listener during the musical performance. As noted above, from the standpoint of the listener, reproduction of the musical work, unlike live music, does not involve participation in the actual musical event. The act of making music is not shared by the listener when the music is experienced as a reproduction. Walter Benjamin explains that the one thing every reproduction lacks is the actual presence of the listener in the time and space where that work exists. He writes:

> even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be (6).

The reproduction of the musical work implies that the time and space of the performance itself will not be

shared by the listener and the performer. This affects the concept of the temporality of the musical work because the actual time of the original performance can never be the same as the actual time of the reproduction.

Secondly, musical temporality is influenced by recording technology through the imposition of a different category of time, which can be called "technological time" or "click track tempo." The click track is something similar to a metronome which removes musical time from the temporally fluctuating experience of the performer and portions it into steady beats. Jon Frederickson explains that,

> the click track tempo is an imposed clock time which does not vary according to the experiences of the players or in response to their interpretation of the organic processes of the work (7).

Technological time or click track tempo gives the performer a precise frame in which the music must fit depending on, for example, the need for a finite time. This procedure is widely used in commercial music.

This new type of objectively measured time is

imposed on the music and represents a type of order which, ultimately, frames the experience of music. Jon Frederickson, writing about the new technology and how music and musical time were influenced by it, explains that the new technological time is an element imposed on the music in the recording session: music is recorded in terms of those technological temporal functions. Frederickson writes: "the musician who interprets musical time has been replaced by the clock which imposes technological time" (8). With the technology of mechanical reproduction, the concrete temporality of a musical work can be dictated from the outside: not only can the length of the piece be imposed, but also a "perfect regularity" in rhythm can be achieved through technological means.

As a consequence of the imposition of technological time, the click track tempo is abstracted from the music, and then imposed on it. Frederickson explains that the concrete musical time of the work is replaced by the click track tempo which dictates the new concrete temporalities. He writes:

> the click track, or technological time, removes time from its musical origins and parcels it out in steady, predictable beats (9).

From Frederickson's statement we can deduce that, ultimately, due to technological time, the performer's subjective musical time is substituted by concrete musical time through the imposition of the click track tempo. The listener's subjective musical time will not be influenced by this imposition.

Finally, the technique of splicing must be considered as another aspect of recording technology which greatly influences musical temporality because of the purpose of the technique itself: to create temporal continuity where there is none. The invention of the tape gave rise to the possibility of bringing together or splicing various recordings or parts of recordings made at different times, and even in different places. Jonathan Kramer explains that "a splice may produce a continuity that never existed prior to recording" (10). This resulted in a new way of processing recorded music: very often music is edited by establishing continuities made up of discontinuous performances. This procedure of editing music affects the temporality of the musical work, because the editor of the recorded piece can alter and manipulate different concrete temporalities to create one musical performance.

Computer-based music is another aspect of the advent of recording technology which has had a great impact

on the concrete musical aspects presented above. Nowadays, many composers are attracted to computer music systems in which they can digitize, process, and edit natural sounds such as those from traditional instruments. Digital techniques offer many advantages, among them, the possibility to splice music with precision, to change pitch and duration of sounds, and to control temporalities. This opens new possibilities in the manipulation of concrete and subjective musical time (11).

In the next section, I will show how modifications in certain aspects of the musical piece influence the two types of musical time discussed in chapter two. To do so, I must first present the discussion between two scholars with different ideas regarding the relationship of musical form and musical time.

2. Discussion on the Interrelation of Temporality and Musical Form by Joan Stambaugh and Patricia Carpenter

To help me with the discussion of the influence of recording technology on musical form and its relationship with the two categories of musical time, concrete and subjective, I introduce a very illustrative discussion between Joan Stambaugh and Patricia Carpenter (12). This debate on the interrelation between temporality and musical

form was presented by the two scholars in two different articles. "Music as a Temporal Form," by Joan Stambaugh, appeared in The Journal of Philosophy in April, 1964. The response to that article was published as "Musical Form Regained," by Patricia Carpenter, in The Journal of Philosophy in 1965.

This discussion between Joan Stambaugh and Patricia Carpenter presents two very different ideas regarding the topic of form and temporality: Joan Stambaugh asserts that musical form is derived from a given time, from concrete musical time. Conversely, Patricia Carpenter explains that musical form could only be derived from the concrete musical time of the piece in interaction with the subjective musical time of the experience. Stambaugh does not make a distinction between concrete and subjective time; she is only aware of the concrete time of the musical form, leaving behind all the experiential temporality of the content. As a result, she does not try to resolve the dichotomy of form and content. On the other hand, Carpenter asserts that there is a time of the form that differs from the time of the content: she concludes that the time of the form is concrete, while the time of the content is subjective. She goes on to explain that the subjective time of the content is indispensable to understand the form of the musical work.

Joan Stambaugh explains that music is a "temporal" structure, as opposed to a structure "in time." She writes that music is

> a structure that constitutes itself in a temporal manner. Time does not precede the structure, nor does it follow from it. It is the structure itself, the way in which the structure unfolds.... [Structure] refers to a forming process (13).

A "temporal structure" is indivisible, indistinguishable from time. A structure "in time," on the other hand, "constitutes itself in time. This time precedes the structure, it is already there providing a framework for what happens in it" (14).

A structure "in time" engenders a dichotomy: structure (or content) versus the time (or form) in which a structure constitutes itself. For Stambaugh, a structure "in time" allows a dichotomy between form and content: "time is here the form in which thoughts, associations, images, and objects appear or are constituted" (15).

Music, however, being a "temporal structure," does not allow for the form-content dichotomy:

> Musical time is not the form for a content which is heterogeneous to it. The "content" of this time form is also temporal. What "flows" in the musical "form" are not concepts, images, or objects. These are atemporal contents.... In musical "form" what "flows" are tones, tone complexes, and patterns, and these are genuinely temporal in themselves (16).

For Stambaugh, musical time is not subjective. She describes subjective time as being "the form in which thoughts, associations, images, and objects appear or are constituted" (17). She also explains that concepts, images, or objects are atemporal, and therefore "concepts are directly opposed to the temporal; they are timeless" (18).

Conversely, musical form derives from an objective, concrete musical time, from a time that is given, a time that is not a domain of the subject. It derives not from "concepts, images, or objects," but from "tones, tone complexes, and patterns," which are temporal structures in their own right.

The problem with this approach is that in determining the content of a musical work the subjective

temporal aspect is set aside. Stambaugh seems to leave behind the experiential part of musical time; she describes all musical time as being a "temporal structure," and overlooks the possibility of a musical time which constitutes itself as a structure in time. Accordingly, she can leave behind all of the experiential part of time, and thereby avoid the dichotomy of form-content by setting aside the subjective content, which is a musical subject matter. She explains that there is no opposition of form and content when discussing musical time. She writes:

> The categories of form and content are also debatable when applied to music....The clear-cut opposition of form and content proves to be inadequate already at the level of a "formalistic" analysis of musical elements, not to speak of the more difficult and complex problem of its meaning. Time ceases to be a form in which something happens when the "content" of this form is not separable from the form itself. When the content itself is "time," time becomes the "happening" itself. It is not that <u>in which</u> something happens, but rather the very process of this happening (19).

Stambaugh considers music to be a temporal

structure in which all the temporal aspects are concrete, and in which there is no dichotomy between form and content. In her approach, Stambaugh is not taking into consideration any subjective aspects of musical time. As we shall see, this is one of the main disagreements between Stambaugh and Carpenter.

Patricia Carpenter does not agree with the avenues Stambaugh takes to resolve the problem of musical form as it relates to musical time. Both authors agree that concrete time provides a general frame for the form to exist in. However, Carpenter argues that the time of the musical form is objective because it is a regulated time, a time which serves as a frame for musical form to exist in (20).

The crucial difference between Stambaugh's and Carpenter's approach is that Carpenter does not set aside the idea of content and the importance of a subjective musical time needed to grasp the content of the musical piece. As Carpenter explains it, Stambaugh concentrates on the concrete aspects of form and on the general ideas regarding form. Carpenter writes:

> the kind of form Miss Stambaugh is after is not unique to music, but "form" in another sense: as material shape, how the inner reveals itself in

> the outer form. This conception of form, applied to music or any art, imposes no dichotomy of form and content (21).

From Patricia Carpenter's viewpoint, musical form is a projection of the listener. The subjective time of the listener's experience gives meaning to that musical form and allows the listener to grasp the idea of musical content. Carpenter asserts that if there is no subject to experience musical time, there would be no musical form. It is precisely through the grasping of content that the listener comprehends form (22).

To illustrate this concept, Carpenter explains how the listener grasps the fugue as a musical form. Fugue, she asserts, does not need concrete time to be processed by the listener; the fugue is "all there" in its initial combination of subject and countersubject. A fugue needs both concrete and subjective musical time to be unravelled and understood as a fugue. She writes:

> [A] fugue...as it is epitomized by Bach, uses a frame...to freeze the forces in order to project a certain heightened moment as if "forever"....the whole of the fugue is "all there" in its initial theme--a basic combination of figures which never

> change, much like pieces of a mosaic; it is a subject that "takes time" to be demonstrated in all its different aspects....A fugue can be listened to one voice at a time, as the theme enters consecutively in each. But this is not to hear the fugue, which is a total, potentially completed, "static" space, shaped in depth, through which the listener moves. If I do not bring along the necessary experience, I hear "not a fugue, but a confused aggregate of tones." Bach's idea of fugue is in a sense timeless; ultimately it must be grasped outside of time (23).

For Patricia Carpenter, musical form exists only if the listener is there to comprehend that form and its content. To comprehend the form means to have an understanding of the work's content. But there must be a subject to understand that content, a subject who uses subjective musical time to grasp the form and its content.

The main difference between Stambaugh's and Carpenter's approach is that, while Stambaugh concentrates on the concrete aspects of musical time and form to avoid a dichotomy between form and content, Carpenter concentrates on the distinction between the concrete and subjective. In

particular, she demonstrates how subjective time is needed to grasp the content of the piece.

I agree with Carpenter's point of view. In the manipulation of the musical form, a distinction between the two categories of time similar to the one made by Carpenter is made evident. While concrete time is affected by a potential manipulation of the musical form, subjective musical time is not.

* * *

With recording technology, the listener is given the power to alter recorded sound in many different ways. One of the ways in which this manipulation can take place is by modifying the concrete chronological succession of musical events. This can be done at will by the listener, but it has no effect upon the subjective time of the work.

John Mowitt and Jacques Attali assert that the subjective aspects of music lose their importance in light of the concrete repetition of a performance allowed by the new recording technology. This assertion can be compared to Stambaugh's viewpoint. In both cases, the subjective constituent of the musical work seems to be set aside by the scholars. As I have shown in the section "Completeness of

the Musical Work," a distinction between the two categories of time and their interaction with the concrete and subjective aspects of musical form can be drawn in a manner similar to the ideas presented by Carpenter. Finally, in "Temporality," I presented different aspects of the new recording technology which greatly influence the concrete temporality of the musical work but not the subjective.

References

1. John Mowitt, "The Sound of Music in the Era of its Electronic Reproducibility," Music and Society (Cambridge University Press, 1989): 175.
2. Jacques Attali, Noise: The Political Economy of Music (Minneapolis: University of Minnesota Press, 1985), 89.
3. Jonathan Kramer, The Time of Music (New York: Macmillan, Inc., 1988), 80.
4. Ibid., 69.
5. Jonathan Kramer, "New Temporalities in Music," Critical Inquiry 7, no.3 (Spring, 1981): 543.
6. Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," Illuminations (New York: Schocken Books, 1968): 220.
7. Jon Frederickson, "Technology and Music Performance in the Age of Mechanical Reproduction," International Review of the Aesthetics and Sociology of Music 20, no.2 (1989): 208.
8. Ibid., 215.
9. Ibid., 208.
10. Kramer, "New Temporalities in Music," 543. One musician

who advocated the positive facets of splicing was Glenn Gould. He held that one beneficial aspect of this technique is that it allows the performer to surpass the limitations that performance imposes on the imagination. He also asserted that the post-performance editing of the recorded piece, as well as the choices made to achieve the excellent result, is as important as the performance itself.

11. More information on the matter of music and computers can be found in the book edited by Curtis Roads Composers and the Computer (Los Altos, California: William Kaufmann, 1985), and in the book by Herbert Deutsch Synthesis (California: Alfred Publishing Company, Inc., 1985).
12. I have decided to introduce this discussion as it was presented by the authors because, in all the research for this thesis, I have not found an equally clearly elaborated exchange of arguments between two scholars which would offer answers as important in the analysis of the influence of recording technology on the concept of musical time.
13. Stambaugh, "Music as a Temporal Form," 267.
14. Ibid.
15. Ibid., 268.
16. Ibid.
17. Ibid.

18. Ibid., 266.

19. Ibid., 273.

20. Patricia Carpenter explains that the time of musical form is objective and "a generally valid event, framed and regulated within a given time-span ("Musical Form Regained," 43).

21. Ibid., 43.

22. Carpenter explains that "a concrete notion of form rests, I think, on a precise grasp of content" (Ibid., 47). With this assertion Carpenter makes clear that her idea of form is directly related to the subjective experience of that musical form through the comprehension of its content.

23. Ibid., 46.

Chapter V

Conclusions

Concrete and Subjective Musical Time, and the New Technology

As I have explained in this thesis, the individuality of the musical work depends on the notion of time. No music would exist without time. That time of the musical piece, musical time, involves two categories: concrete and subjective. These two categories of musical time interact in the musical process.

In this thesis I tried to make the clearest distinction between concrete and subjective musical time. Therefore, I concentrated on the domain of subjective musical time that is not influenced by the changes in concrete temporality of the musical piece, even though I am aware of the existence of a domain of subjective musical time that does allow for change in temporal experience. Future work will entail analyzing that domain, but it is beyond the scope of this thesis.

As an example of the two domains of subjective musical time, we can think of Beethoven's Fifth Symphony as

it was composed, and the same symphony being performed in its transcription for piano. The domain of subjective musical time that does not change is the one involving the listener's experience of the exact succession of notes, rhythms and tempi. This domain allows the listener to experience the subjective musical time of the work in the same way, regardless of the instrumentation being used. The other domain of subjective musical time would change according to changes in the concrete musical time of the work. For example, the subjective musical time of the symphony might be experienced differently by the changes in instrumentation (from orchestra to piano) and by the changes in articulations which result.

This thesis was also concerned with the influence of the new recording technology on concrete time as well as on that aspect of subjective musical time that cannot be altered by the changes in concrete musical aspects. The new recording technology deeply influences the concrete musical time of the piece through the changes in the musical aesthetic ritual, as well as through its influence on the concrete aspects of the musical work, such as reproduction, completeness and temporality.

Concrete musical time is deeply influenced by recording technology because of the new power acquired by

the listener to manipulate the chronological succession of musical events, and, consequently, the concrete aspects of the musical piece. As I explained above, the listener obtains a new freedom to manipulate, rearrange, delete, or retrieve parts of the piece at will.

When a musical piece is not performed in its entirety, or when the parts of the piece are rearranged, the concrete musical time of the piece is also modified. Thanks to the new recording technology the listener can alter the chronological succession of musical events. He becomes a potential manipulator of the music being listened to. For example, in the case of studying a work written in sonata form, the listener might want to analyze the correspondence between exposition and recapitulation. In that case, the listener can arrange the exposition to be followed by the recapitulation, leaving the development completely to one side by deleting it. As we can see, the concrete temporality of that particular work would be deeply altered. So too in a fugue, if the order of the subjects' entries is manipulated, for example, to have them appear in places other than the ones presented by the composer, the concrete musical time of the work would be affected.

Yet, even with this vulnerability of the concrete temporal aspect of the musical piece, the subjective

individuality of the musical work cannot be altered as dramatically if we consider the most extreme domain of subjective musical time. Coming back to the example of the sonata form, when the sections are reorganized or deleted, the work is still recognizable by the listener. There is no mistaking a section of development for an expository section. Also the fugue is recognized even when the subjects' entries are rearranged.

As Carpenter asserts, the fugue would be recognized as such only if the listener is there to comprehend its form and its content. The concrete form of the work might be altered, but its subjective form remains the same. The musical work does not lose its subjective identity, or individuality, as Ingarden calls it, through alteration by means of recording technology.

This most extreme aspect of subjective musical time, then, cannot be affected by technology as dramatically as concrete musical time can. This aspect of subjective musical time, as well as the grasping of content, are the domain of the subject. In chapter two, I defined subjective musical time by explaining that it involves the perceptive part of the temporal concept, and that it represents the relationship between people and the events they perceive. Recording technology cannot influence this definition, since

the key issue is the subject and not the object.

When the musical aesthetic ritual is altered, and the musical form is manipulated, the concrete musical time of the musical work is manipulated as well. Concrete musical time, being the domain of the object, can be manipulated. This is accomplished when the completeness of the musical form is altered. Conversely, the most extreme aspect of subjective musical time will continue intact as long as the subject exists to grasp that form, manipulated or not, and its content. As we can extract from Patricia Carpenter's writings, subjective musical time is a subject's domain, and this type of time is needed to fully understand the musical piece and its content. Since subjective musical time is experienced by a subject, it cannot be affected in the same way concrete musical time is.

The appearance of recording technology allowed for the manipulation of recorded sound, which brought about changes in the musical aesthetic ritual and in certain concrete aesthetic aspects of the musical work such as reproduction, completeness, and temporality. This potential manipulation of recorded sound does not have the same effect, however, on the extreme subjective musical time of the musical work and its content.

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Index