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THE COGNITIVE CONTINUUM
OF ELECTRONIC MUSIC

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PROMOTIECOMISSIE

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ACCOMPANYING MATERIAL

The eight pieces of electronic music composed as part of this research can be accessed at http://anilcamci.com/thesis.

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INTRODUCTION

The use of the electronic medium to compose music entails a variety of cognitive idiosyncrasies which are experienced by both the artist and the audience. Structured around this medium on both practical and conceptual levels, this study utilizes a tripartite methodology involving artistic practice, cognitive experimentation and theoretical discourse to investigate these idiosyncrasies. All three components of this methodology operate concurrently and in intricate mutual relationships to address a succession of questions: How do we experience electronic music? How does electronic music operate on perceptual, cognitive and affective levels? What are the common concepts activated in the listener's mind when listening to electronic music? Why and how are these concepts activated?

In this book I will argue that our experience of electronic music is guided by a cognitive continuum rooted in our everyday experiences. This continuum will be described as spanning from abstract to representational based on the relationship of gestures in electronic music to events in the environment. I will characterize *gesture* as "a meaningful unit in electronic music", and contend that the cognition of a gesture will be positioned on the said continuum in reference to the listener's past encounters with auditory phenomena. The idiosyncrasies of the electronic music experience will be associated with the cognitive continuum through examples from my artistic practice and listener reports.

During the course of this research, I have composed eight pieces of electronic music. The theoretical constructs discussed in this book operated at various levels of their materialization. Four of these works were utilized in experiments conducted with 80 participants. I have designed the said experiment to acquire a detailed account of the listening experience. Furthermore, I have implemented software to collect and also to analyze the data from this experiment. Throughout this book, I will refer to various interpretations of these data to motivate links between theoretical models and artistic practice. Having both designed the experiment and composed the material used in it[1], I believe to have achieved an unmediated connection with the feedback from the listeners. This form of involvement has not only granted me precise control over experimental parameters, but also yielded unique insights into the experience of electronic music. A comprehensive theoretical discourse throughout the book will externalize these insights by relating them to studies from a variety of fields.

I characterize this undertaking as a cognitive study of electronic music not simply due to its incorporation of a listening experiment but also on account of its fundamentally interdisciplinary nature: in order to provide an exhaustive report on the cognitive processes instigated by electronic music, I will weave links between music composition, cognitive psychology, neuroscience, linguistics and philosophy. Furthermore, my composition practice

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[1] With the exception of Curtis Roads' piece *Touche pas,* which was also used in the experiments.

and the methods used to procure and asses the experiment data rely on computer science. In these regards, current research embraces a cognitive science approach towards a study of the experiential characteristics of electronic music.

In 1977, the composer Pierre Boulez wrote that musical invention was faced with a number of challenges "particularly concerned with the relation between the *conception* (we might even say the vision) of the composer and the *realization* in sound of his ideas" (1986: 5). According to Boulez, an understanding of contemporary technology was necessary for the composer to overcome such challenges (12). Thirty-seven years later, technology today is liberated to an unprecedented extent and the divide between the artist and the engineer has all but dissolved. But as we overcame the challenges of technology, we were confronted with the challenges of the emerging prospects. In 1996, the composer Denis Smalley identified the attraction of electronic music in its "openness to maximum imaginative potential" but asserted that determining and harnessing "the fields of indicative operation" remained a challenge for the composer (101). In an article he wrote the following year, he described that a major problem for the electronic music composer is "to cut an aesthetic path and discover a stability in a wide-open sound world" (1997: 107).

Later in this book, I will ask what is to be unexpected in electronic music if everything is expected of it. If listening to music can be characterized as an artistic experience of contrasts and surprises in various dimensions, the act of composition can be regarded as building up expectations and then either meeting or evading them. I will contend that the network of expectations in electronic music is inherited from everyday life. This does not imply that all composers begin their work with an everyday narrative. Neither do I claim that listening to electronic music is rooted exclusively in representations. But as I will further discuss, abstractness is nevertheless a negation of reality and composers design the unreal based on their knowledge of the real. I will argue that when the virtually limitless vocabulary of electronic music expands that of a culturally established language of music, it instigates for the listener a profusion of references rooted in *events* in the environment.

I will characterize events as units by which perceived time moves forward. I will relate events to environmental sounds and furthermore to electronic music in order to construct an idiomatic definition of a *gesture* in electronic music. These links will be motivated with existing models of experience and research on auditory perception. Doing so will help me bind my practice as a composer with the listener reports from the experiments. To contextualize the cognitive disposition of the human mind in an artistic experience, I will incorporate a semiological model and demarcate gesture as a trace to which the poietic and esthesic processes apply. This approach will liberate gesture from a communicational hierarchy between the artist and the audience, and will place the emphasis on the complexity of listening instead.

Later in the book, I will propose the concept of *diegesis* (Çamcı 2013) to highlight both the physical and the semantic aspects of the communication between the composer and the listener. The layer of meaning attribution pertinent to electronic music will be described to form a semantic domain that is superimposed on the physical domain. I will outline a coalescence of representational modes informed by the various interpretations of diegesis, and will situate electronic music in a broad context of artistic forms. In doing so, I will attempt to devise a semantic paradigm for the contextual evaluation of the gesture/event model. By providing examples from the listener reports, I will delineate various relationships between the domains of experience on both perceptual and conceptual levels.

While formulating the aforementioned theoretical constructs, I will constantly refer to my experimental findings as well as other empirical research. As the analyses of the experiment data will further demonstrate, adopting perceptual models pertaining to everyday life serves an intuitive role in discussing the experience of electronic music. There is a significant amount of research outside of musical studies which might help us better understand the inner workings of this experience, and I will attempt to incorporate these in my own discourse in meaningful ways. The practical discussion will be in constant reciprocation with a theoretical discourse, in which I will construct arguments by combining perspectives from different paradigms: I will, for instance, bring together Nattiez's *trace* with Vaggione's *action/perception feedback loops*, Deleuze and Guattari's *affect* with Gibson's *affordances* and Plato's *mimesis* with Genette's *diegesis*. The result will amount to a rigorous portrayal of the electronic music experience in terms of the cognitive processes forming in the composer's mind, which then become embodied in the physical domain in the form of sounds, and finally get subjected to the listener's cognitive appraisal.

According to Smalley, "consistent, thorough and fairly universally applicable analytical tools" are necessary for electronic music to be accepted in wider intellectual circles (1997: 108). Although I did not set out to elaborate analytical devices when establishing the theoretical framework of this study, concepts of gesture and diegesis, as defined in this book, can facilitate the discourse on electronic music not only within musical communities, but within a wider context of artistic research including such fields as fine art, theater and literature. Furthermore, cognitive idiosyncrasies of electronic music detailed in Chapter 3 and practical strategies discussed in Chapter 5 will render the current study relevant for cognitive science and design communities.

Throughout the book, I will question what we hear in electronic music, how we hear it, and what the cognitive determinants of this act are. As I answer these questions, I will delineate the cognitive continuum of electronic music as an inextricable component of the listening experience. I will characterize this continuum as a device at the artist's disposal, and one that can serve to address the challenges described earlier. In 1986, the composer Simon Emmerson suggested that even if a composer is not interested in manipulating the images associated with electronic music, the duality between mimetic and aural contents must at least be taken into account (19). In the same article, Emmerson asserts that future research must combine "psychology of music with investigation of deeper levels of symbolic representation and communication" to examine why particular sound combinations in electronic music 'work' (21). I believe that the current study addresses this appeal in its pursuit to further our awareness and understanding of the cognitive continuum of electronic music.