

WHAT IS AN EVENT?

The EVENT Schema, Circumstances, Metaphor And Gist

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ABSTRACT

The concept of 'event' is examined in the context of the electroacoustic music. Initial insights are gleaned from the study of 'event' in linguistics, in particular, the work of Johnson and Lakoff that reveals universal features of how we think about 'events'. Narayanan's work on linguistic aspect serves as the basis for a proposed EVENT schema, a mental model of the states and processes of an 'event'. The EVENT schema's properties relate it to important issues of artistic content including causality, resources and metaphorical meaning. In the realtime process of listening to a piece of electroacoustic music, the EVENT schema is bound together with particular *Circumstances*. Even when an 'event' cannot be completely assimilated, the listener constructs the gist of the 'event'. This notion of gist similarly relates to the intentional impoverishment of *Circumstances* experienced in electroacoustic music, an artistic abbreviation that leaves open space for the imagination.

1. INTRODUCTION

The concept of 'event' is fundamental to most discussions of electroacoustic music and yet has not been carefully studied as a subject in itself. We often treat 'events' as self-evident, but this cursory impression masks a world of complexity. We might have the impression that the recognition of an 'event' is automatic, but how did we come to that decision and, more importantly, what do we mean by that designation? Such self-evident instances of 'event' are signposts to the hidden complexity of the mind and the ease with which we arrive at complex decisions with deceptively little conscious effort. Consider also that our understanding of 'event' in electroacoustic music is shaped by a larger domain of experience than just electroacoustic music or even auditory perception. We characterize and organize much of the activity in the world around us as 'events', and any thorough explanation of 'event' in electroacoustic music must acknowledge both the scope and the levels at which 'event' appears to operate. We need a concept of 'event' that can be related to the art of electroacoustic music and at the same time be informed by our broadest experience.

The context of art is particularly important here. It raises the question of how our understanding of 'event' might be different in the domain of artistic experience than in others. Art is a context essentially detached from the outcomes of practical endeavors and at the same time inseparably tied to our experience of the everyday world. We can experience art as reflecting on other aspects of life through metaphor. The artistic play of 'events' in electroacoustic music can be experienced as a

metaphorical dialog about the experience of everyday 'events' in which sound and music are able to conjure novel and interesting associations, though often connected together at a subconscious level.

2. LINGUISTIC INSIGHT INTO 'EVENT'

While the concept of 'event' has been treated in many fields from physics to philosophy, the treatment of 'event' in linguistics is particularly rich with potential significance for electroacoustic music. The way in which we communicate about 'events' in language reveals universal features of how we think about 'events'. A potential source of this universality is the embodied nature of the mind that influences both language and the cognition of 'events'. Lakoff and Johnson have made the case for the embodied nature of language, especially the way in which sensorimotor knowledge informs language on many levels [2,4]. For example, spatial relationships acquired through bodily experience are not only expressed in language ("I am on top of the mat.") but are also used metaphorically to express relationships that are not spatial *per se* ("I am on top of my studies."). For Lakoff and Johnson our recurring patterns of spatial understanding are captured as image schemas, among which they identify CONTAINMENT, PATH and SOURCE-PATH-GOAL. These are understood to be pre-linguistic cognitive structures established through multimodal body experience. Most interesting for human cognition is the capacity of such schemas to give rise to metaphorical reasoning (as illustrated by Lakoff's "event structure metaphor" discussed later [5,6]).

The concept of 'event' has also been studied in relation to what is termed linguistic *aspect*, the way in which language communicates about the temporal flow of an event. While tense captures the time at which an event occurs (or the temporal relationship between events), aspect captures the state and progress of an event. Aspect in English can be demonstrated in the comparison of the statements "I eat" with "I am eating" (present simple vs. present progressive) or "I have eaten" with "I have been eating" (present perfect vs. present perfect progressive). The first statement in each pair communicates that the event is concluded while the second, the progressive one, communicates that the event is still in progress. The study of aspect in language has helped to reveal the common perspectives and considerations that human beings bring to the characterization of 'events'.

In this regard the work of Sridhar Narayanan [8] is very informative. Narayanan has demonstrated that a single schematic structure can characterize both high-level sensorimotor movements and linguistic aspect. The

insight that our linguistic framework for ‘events’ is deeply related to the same structure that controls bodily movements supports Lakoff and Johnson’s concept of embodied knowledge. Narayanan says that his general schema, CONTROLLER, “captures the basic temporal structure of our conceptualization of events” [8]. A simplified graphic representation of CONTROLLER is shown in Fig. 1, and its relationship to linguistic aspect is illustrated in Fig. 2.

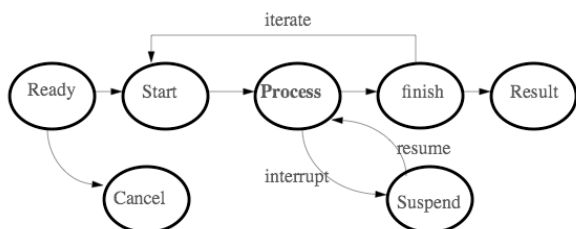


Figure 1. A simplified representation of Narayanan’s CONTROLLER schema [9].

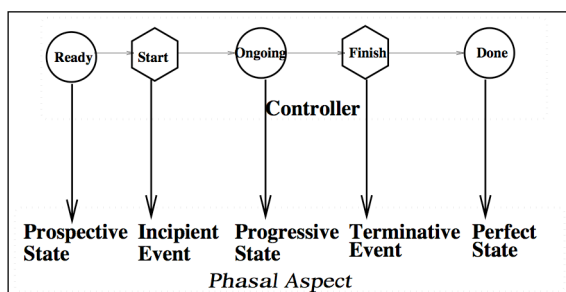


Figure 2. A simplified representation of Narayanan’s CONTROLLER schema [9].

Based on Narayanan’s work, Lakoff and Johnson [6] provide the following general description of the stages of an ‘event’:

- “Initial State: Whatever is required for the event is satisfied
- Start: The starting up process for the event
- End of Start: The end of the starting up process and the beginning of the main process
- Main Process: The central aspects of the event
- Possible Interruptions: Disruptions of the main process
- Possible Continuation or Iteration: The perpetuation or repetition of the main process
- Resultant State: The state resulting from the main process”

Narayanan’s ‘event’ model is formalized as an x-schema (an executing schema). X-schemas are “parameterized routines with internal state that execute when invoked” [8]. They are dynamic patterns that unfold over time and are thereby differentiated from the many kinds of static and purely relational schemas. Narayanan conceived his CONTROLLER schema as a generalization of x-schemas developed for specific examples of sensorimotor processes such as walking and climbing. The interface between such schemas and language assumes a bi-directional interaction with mappings between linguistic features and schematic parameters. Importantly, such interactions are active, realtime and sensitive to circumstances.

While there are considerable differences between Narayanan’s area of study and electroacoustic music, there are similarities too. Consider the often-remarked relationship between music and language. When we relate linguistic concepts to electroacoustic musical constructions, we find potential common ground in the pre-linguistic knowledge that informs both. For example, the idea that sensorimotor experience deeply influences language can be compared with the idea that the experience of music is mentally associated with the physical act of singing or performing an instrument. Even for electroacoustic music that is created without performing actions, the concept of ‘gesture’ is often discussed as a major organizing influence. Linguistics can be related to electroacoustic music also in the way in which this pre-linguistic knowledge may give rise to metaphorical understandings. Such knowledge is abstracted from one set of experiences and then very imaginatively related to others. Consider the way in which we make sense of the coda of a composition as a concluding gesture. Notwithstanding, there are considerable differences between language and music, especially in regard to semantics. While the semantics of speech is a quite distinct area from its phonetics, what we might call the semantics of electroacoustic music is tightly coupled with its phonetics, the sound itself. This is one reason why understanding the cognitive structure of ‘event’ is so extremely important to electroacoustic music.

3. THE EVENT SCHEMA

A full consideration of the question, “What is an event?”, causes us to confront our most basic issues of how we experience and make sense of electroacoustic music. At one level, ‘event’ is an immediate and seemingly automatic understanding of sensory experience. It is the sense that we make of auditory impressions. At this level, ‘event’ is closely linked to neurological processing and principles of auditory scene analysis. We *make sense* of the sensory information bundled by the auditory system as something *understandable* like someone hitting a drum or blowing a flute. At another level, ‘event’ has a metaphorical meaning that we ascribe to a diversity of sensory experiences. It is a way in which we *make sense* of the flow of auditory information, connecting and grouping component ‘events’. The outburst of the drums and the cadenza of the flute are groups of shorter ‘events’ that we often metaphorically organize as an ‘event’. In both cases ‘event’ is a flexible framework through which we make sense of sound and in no domain of experience is that flexibility needed more than in electroacoustic music where the usual categories of auditory perception are frequently blurred.

Inspired by the work of Narayanan [8], an EVENT schema is first proposed and then explored in relation to auditory phenomena in general and to the art of electroacoustic music in particular. Based on Narayanan’s CONTROLLER schema, this EVENT schema is a generic model that captures the essential

temporal structure by which auditory experiences may be *understood* as ‘events’. Its potential usefulness for electroacoustic music analysis is explored in numerous domains. Emerging as it does from Narayanan’s analysis of sensorimotor activity, it provides a framework for discussing the relationship of electroacoustic musical content to embodied experience. As a model that executes through time, the EVENT schema is valuable in extending our understanding of realtime process such as listening. Then too, a full consideration of the implications of the EVENT schema in electroacoustic music raises important subsidiary issues such as the potential for multi-leveled and metaphorical ‘events’ as well as the unique ways in which EVENT functions in artistic contexts, especially as we shall see in relationship to auditory gist and artistic abbreviation.

It is clear that ‘event’ is an important cognitive organizing principle in many domains of hearing besides electroacoustic music, but it is particularly important for electroacoustic music because no other domain of auditory experience encompasses so many kinds of auditory relationships. This is especially true since electroacoustic music engages in the artistic exploration of these relationships. It is the most diverse and complex form of auditory communication. Then too, the role of cognitive schema in electroacoustic music is far less studied and less well understood than in classical or popular music. In this respect, one should be cautious of extending the conclusions of research based on schemas of discrete pitch and metric rhythm to electroacoustic music where these elements play a far less significant role. Part of the excitement of electroacoustic music is its on-going artistic exploration and integration of so many kinds of auditory phenomena. The proposed EVENT schema is a structure that attempts to capture meaningful cognitive relationships within that diversity.

3.1. Definition

The EVENT schema is a dynamic model that includes component parts representing processes and others representing state. The model is dynamic in several respects. First, it is a pattern that executes through time. It changes state during the process of its execution. Second, it has junctures at which the execution can be directed along alternative paths. As shown in Fig. 3, execution runs from beginning to end, but can also include interations and interruptions. This schema also includes steps that are often inaudible such as ‘Enabled’,

‘Preparing’ and ‘Ready’ that capture the preparation for the start of an ‘event’.

3.2. Properties of EVENT

3.2.1. Types of Events

The EVENT schema must be able to accommodate the diversity that exists in the types of ‘events’ that we encounter in everyday life and in the multi-level meanings that we ascribe to ‘events’. In thinking about conventional music, we might consider the notes as ‘events’ and the various physical modes of performance as types of ‘events’. In the same way that Narayanan based his CONTROLLER schema on the analysis of many typical motor action schemas, the EVENT schema can be understood as a general model that encompasses the structure of many forms of common auditory experiences, some of which have familiar schemas of their own.

Such types of EVENTS are themselves recurrent patterns by which we understand more specific kinds of acoustic behavior. For example, we may generalize the pattern of sound produced by the action of striking an object, whether it is a snare drum or gong, as starting with a gathering of energy followed by a quick release. The listener apprehends the sound of a particular strike in terms of the specifics of the moment: the temporal pattern to the flow of force as well as the specific characteristics of the physical object receiving the energy. The sound produced by blowing on a flute can also be understood in terms of the flow of force that sustains the sound in the ongoing process and the nature of how the object responds to the force. These two situations can be understood as specific instances of different general patterns of energy flow---the first, the ‘burst’ of energy and the second, the sustained ‘disbursement’ of energy. These are specific forms of EVENT that have a clear relationship to embodied experience. Fig. 4 illustrates BURST as a subclass of EVENT in which the ‘Ongoing’ process is by-passed. Fig. 5 illustrates DISBURSE as a subclass of EVENT in which the ‘Ongoing’ process is sustained over time. These schemas are characterized by both their sequence of states and their energy profiles. These kinds of distinctions are somewhat reflected in linguistics by Johnson and Lakoff’s image schemas for force and motion, especially COMPULSION and

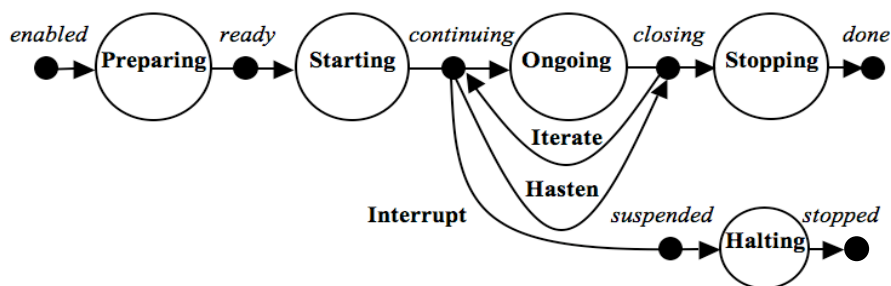


Figure 3. Representation of the EVENT schema. Processes are represented as circles and states as dots.

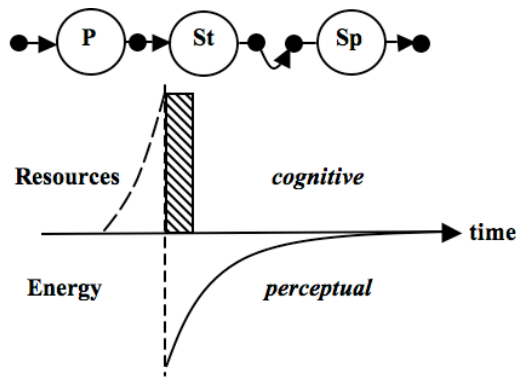


Figure 4. Representation of the BURST schema, also illustrating its relationship to Resources and Energy.

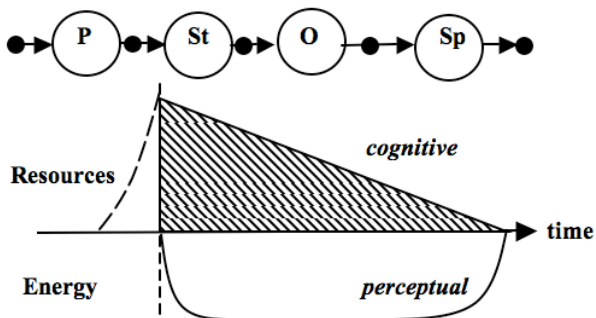


Figure 5. Representation of the DISBURSE schema and its relationship to Resources and Energy.

ENABLEMENT. Wishart would likely associate the BURST schema with *intrinsic* morphologies and DISBURSE with *imposed* ones [13].

A similar notion to ‘types of events’ is discussed by Denis Smalley as *morphological archetypes*, essentially patterns of “temporal shaping” which are “extensions of human action.” [12]. In this context, BURST can be related to the *attack-impulse archetype* and DISBURSEMENT to the *graduated continuant archetype*. While Smalley uses different language, he clearly thinks of the *morphological archetypes* similarly to schemas. A conceptual difference is that Smalley blurs the distinction between the mental ‘event’ and the acoustic one. While the temporal profile of an *attack-impulse* might be transient, the understanding of it also requires the notion that energy was stored in preparation for the initiation of sound. In this way, the EVENT schema represents a pattern for understanding, not just a perceived temporal shape. Smalley also conceives of these *archetypes* as constituting a small set of base patterns out of which a larger set of *morphological models* are constituted. A contrasting property of the EVENT schema is that it reflects the commonality of mental processes that engage and make sense of such a diversity of acoustic patterns. Rather than categorizing experience in terms of a small set of basis patterns, the listener adapts the EVENT schema flexibly to the progress and the dynamic flow of a potential ‘event’. Consider too that sounds produced by electronic means can be understood in terms of familiar patterns or novel ones. The variety of temporal pathways through the EVENT schema provides a flexible framework for

managing unfamiliar situations as well as recognizing recurrent patterns.

3.2.2. Resources

The energy and effort associated with force and motion can be generalized through the concept of resources. Resources are certainly consumed in support of sensorimotor activity (although there are other types of resource consumption). In electroacoustic music ‘events’ can be separated on the basis of those that require the concept of resources and those that do not. Some ‘events’ are more closely related to mental experience than to the physical, such as those instanced in juxtaposition or shifts of context. (Consider Varèse’s *Poème électronique* in this regard [3].) ‘Events’ that do invoke a relationship to resources may vary in their kind of the resource consumption. ‘Events’ that we relate to gesture are linked with the sense of bodily effort required for the gesture. We understand that the progress of such an ‘event’ consumes physical energy. Figs. 4 and 5 illustrate the relationship between the perceived expenditure of energy and the understanding of resource consumption. These energy profiles are analogous to the criteria of Schaeffer’s *plan dynamique* and Smalley’s *morphological archetypes* [10,11] while the resource profiles capture a cognitive perspective on the resource expenditure supporting the flow of energy through time.

There are some circumstances in which the consumable is something different from physical energy. In Dhomont’s *Artifices* we experience the consumption of burning matches, exploding fireworks, etc. In Paramerud’s *Les Object Obscures Part III* it is the emptying of marbles onto a hard surface. These examples from acousmatic music highlight an important aspect of electroacoustic music in relation to resources. The exact nature of the resources may not be known (as in the case of these two examples), but the impression of resource expenditure is understood just the same. We infer the relation of resource consumption to ‘events’ even when we cannot identify the physical situation. Then too, the listener’s estimate of the resources expended during an ‘event’ is deduced through their expenditure. When an ‘event’ occurs, we typically do not know the magnitude of the event’s ‘resources’ at the start; we take measure of the resources during the course of the ‘event’. Our estimate is accumulated and adjusted during the event’s progress toward completion. In this sense, our understanding of the total resources of an ‘event’ unfolds in just the opposite way to which resources are depleted during the execution of the ‘event’. An electroacoustic composition does not possess a particular amount of energy at the start that runs out by the end of the work. Rather it has the ‘energy’ created in the listener’s mind while apprehending ‘events’ that expend resources. The way in which the energy propelling the work of art is simply called into existence is liberated from the necessities of material resources for practical endeavors.

3.2.3. Causality, Agency, Purpose and Goals

In almost all areas of life, there is little separation between our experience of 'events' and their causes. This is because we experience 'cause' as the determining factor for the changes of state that take place within an 'event'. Just as sensorimotor activity serves as the embodied basis of 'event', the application of bodily force (typified in the manipulation of an object) serves as the embodied basis of causality. At the root is human agency. This explains the extent to which we personify other forms of agency with human metaphors---Mother Nature, the Goddess of Fate, etc.

We have very deep sensorimotor knowledge about movement in space---so deep that inference based on this knowledge is often the basis of reasoning about causality. In linguistic study, 'events' and causes are linked together in *event-structure concepts*. Lakoff and Johnson [6] tell us that there are two primary metaphors associated with causality, one of which is the *location event-structure* metaphor. They provide the following mapping between the domain of 'events' and the domain of spatial motion:

States are Locations
Changes are Movements
Causes are Forces
Causation is Forced Movement
Actions are Self-propelled Movements
Purposes are Destinations
Means are Paths
Difficulties are Impediments to Motion
Freedom of Action is the Lack of Impediments to Motion
External Events are Large, Moving Objects (that exert force)
Long-term, Purposeful Activities are Journeys

Many 'events' move either literally or metaphorically from one location to another. Let us consider the case of literal movement. In everyday life, spatial motion requires effort, the expenditure of energy. Interestingly, the ease with which sources are panned between loudspeakers seems to liberate this movement from the effort associated with the physical world. Sounds can fly. Nonetheless, imparting motion to an 'event' is one of the many ways in which the apparent consumption of a resource causes the listener to infer the expenditure of energy. Then too, motion along a path is a primary sensorimotor pattern. Variations in such patterns are generalized and captured by two important image schemas: PATH and SOURCE-PATH-GOAL [2,4]. These spatial schema are a significant part of the embodied basis of 'events' in electroacoustic music. We create metaphorical blends between the experience of literal movement and the unfolding temporal sequence of 'events'. We may infer causes, purposes, and goals. Such unfolding of 'events' through time can give rise to suspense and anticipation. For example, during the temporal unfolding of a DISBURSE 'event', one does not know the total magnitude of the resource until the 'event' is completed. In this way, the electroacoustic 'event' takes part in a broad tradition in the temporal arts

of manipulating anticipation as part of the artistic content. The unfolding of the electroacoustic 'event' can be analogous to Schenker's 'zug' or Meyer's theories of 'inhibition' in 'pattern perception' [7,11].

Notions of causality and agency constitute a major theme in discussions of electroacoustic music and are often connected to musical gesture. Gestural patterns are exactly the kind of schematized sensorimotor activity that is embraced as types of 'events'. One virtue of the EVENT schema is that it clarifies the relationship between cognitive and bodily activity. Gestures are part of the sensorimotor experience that gives rise to embodied knowledge codified as schemas. Once these schemas are established, the imagination spontaneously associates schemas with new circumstances and conjures up metaphorical gestures. Then too, not all electroacoustic 'events' can be understood as gestures. For example, consider 'events' with no association to resources such as shifts of focus or sequential juxtapositions.

Purposes and goals may be associated with the agency of the composer's intent or even with the imagined agency of the composition's own 'logic'. Viewed in the general context of agency, these seem hardly more fictional than any other kind of explanation. On the other hand, in certain kinds of electroacoustic art, such notions would be particularly misguided if the composer had intentionally distanced himself/herself from the creative result as in the case of indeterminant techniques of composition. Then too, 'events' may have non-human agency as in the case of the insect worlds in works by David Dunn. Then again, Barry Truax's sonic environment *Riverrun* gives the impression of non-human agency even without the use of recorded sound. An interesting by-product is the perception that *Riverrun*'s energy resources are near limitless like the forces of nature.

Incidentally, the other primary *event-structure* metaphor is the *object event-structure*. Lakoff and Johnson [6] provide this mapping between the domain of 'events' and the domain of objects:

Attributes are Possessions
Changes are Movements of Possessions
Causation is Transfer of Possessions
Purposes are Desired Objects

This metaphor is most easily understood in the interaction of component 'events'. An 'event' may have certain timbral possessions that we identify as attributes (brightness, inharmonicity, etc.). These attributes can be transferred from one 'event' to another as is typical in music with parameterized approaches to sound synthesis such as John Chowning's *Stria* or with criteria-oriented approaches to acousmatic sound such as Schaeffer's *Etude aux allures*.

3.2.4. Reflecting on Time

Our conceptualization of 'event' touches on our most basic concepts of time. Lakoff and Johnson [6] observe that we do not conceptualize time in terms of time itself.

When we consider our direct experience of time, we do it in terms of ‘events’, either by judging the phase or state of an event or through comparing events. Time is essentially a conceptual domain. The EVENT schema captures changes in time by the sequence of its states and processes, and in the same sense that time is directional (and irreversible), so is that sequence. To the extent that we conceive of time as measurable, it is measured by the iteration of events (like a clock ticking). The continuity of time is captured by the directed sequence of EVENT, as the segmentability of time is captured by its changes of state. On the other hand, ambience may be constant, outside of time and outside the domain of ‘events’.

3.2.5. Metaphor and Nesting

Our core understanding of ‘event’ is embodied and framed in the context of sensorimotor activity, and our sense of the flow of an ‘event’ is rooted in the continuity of the body. Our core understanding of an *auditory* ‘event’ is also framed within embodied experience and has a typical timescale conditioned by physical actions and short-term memory. But just as we must continually make sense of bodily experience that extends beyond the timescale of individual sensorimotor ‘events’, so must we continually make sense of ongoing auditory experience. The EVENT schema can be related to experiences that extend beyond the typical timescale of simple sensorimotor ‘events’ and that require long-term memory. It provides a framework for understanding complex experiences independent of their timescale. In this sense the EVENT schema is a framework for metaphorical understanding. The meaning of extended, complex experience is grounded in terms of simpler embodied sensorimotor experience. For example, referring to conventional music again, the combination of notes into higher levels of musical organization such as phrases or sections can be understood as ‘events’ fulfilling the pattern of the EVENT schema.

The corresponding property of the EVENT schema is that component processes (such as Preparing, Starting, Ongoing, etc.) might themselves be instantiated as EVENTS. Every human being has a large repertoire of EVENT types that are learned during the course of everyday endeavors. Once these types of EVENTS are internalized, they are available to be spontaneously associated within encompassing ‘events’. This is an important way in which the listener begins to grasp more and more complex experience in terms of the EVENT schema. A group of ‘strikes’ may be understood as an ‘event’ that involves iteration and imparts its own sense of dynamic flow.

This notion of compositing component ‘events’ into encompassing, long-term ‘events’ is fundamental to the apprehension of most music. We can conceptualize the listener’s hierarchic layering of ‘events’ with the component ‘events’ at the lowest, bottom stratum and the encompassing ‘events’ at successively higher levels. The bottom stratum may exhibit simultaneous streams of ‘events’ with their own separate hierarchies that the listener may combine together at higher levels. Then too,

not all strata are equally important to the listener. Some layers are the primary carriers of significance and meaning, the strata that can be identified as the *focal layers*. For example, in Barry Truax’s *Riverrun* the level of individual sonic events, the level of grains, is of relatively little significance to the listener. The *focal layer* is the one at which the grains are slowly transformed. The first five and a half minutes of *Riverrun* can be understood as several simultaneous ‘events’ at the focal level, all of which combine into the single ‘event’ of the first section as illustrated in Fig. 6. A similar point can be made about the first seven and a half minutes of Xenakis’s *La Legende d’Eer*. A very typical situation is shown in Fig. 7. In this excerpt from *Pentes* by Denis Smalley a large number of rapid ‘events’ are composited into an encompassing ‘event’ at the *focal layer*.

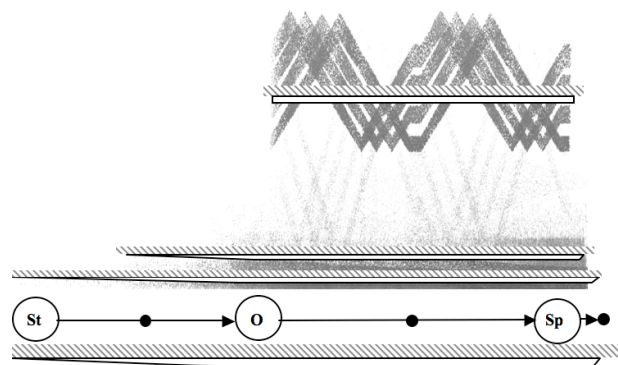


Figure 6. Representation of the initial 5½ minutes of *Riverrun* by Barry Truax. In the background is a sonogram. Superimposed are representations of three essential layers of sound that are made up of many individual grains. At the *focal layer* the entire section can be heard with its own EVENT structure.

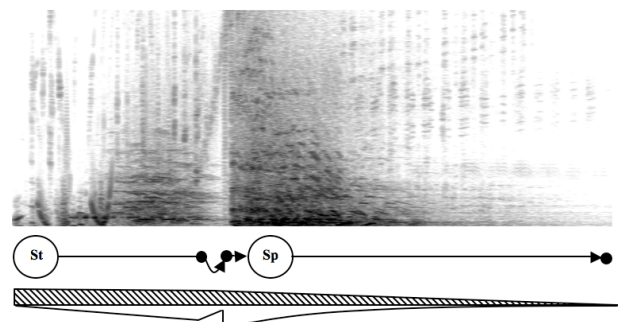


Figure 7. Representation of a 4'' excerpt that occurs at 0' 41'' in *Pentes* by Denis Smalley. In the background is a sonogram showing many individual ‘events’ that make up this encompassing ‘event’ at the *focal layer*.

4. LISTENING

The EVENT schema presents a general framework by which the listener to electroacoustic music makes sense of the flow of perceptual information. The EVENT schema executes in realtime as the listener is continually forming an understanding. States change, processes unfold and resources are evaluated as the listener assimilates new information moment to moment. In the

case that auditory information is clear and easily fits the schema, the listener may comprehend the ‘event’ with little or no conscious effort. In the case that the information is ambiguous or incomplete, grasping the ‘event’ may require mental effort.

4.1 Binding to Circumstances.

The EVENT schema is in itself a general pattern that can be associated with many kinds of situations. While it captures the essential states and processes that we associate with ‘events’ in general, it lacks all of the specifics that we associate with an actual ‘event.’ It is only one aspect of forming an understanding. In the realtime process of listening, the listener must combine the EVENT schema with particular ‘circumstances’. The specific way in which the listener binds these together is the act of understanding that unites the abstract with the concrete. The *Circumstances* may include information about the sounding object, the physical processes---in short, all of the information that takes the abstraction of EVENT and links it with specifics. For example, the *Circumstances* clarify whether a DISBURSE ‘event’ is blowing or bowing. But it is not simply a matter of filling in all of the blank parameters for the EVENT schema with data from the *Circumstances*, because the blending of such disparate elements requires a creative act. Even the mental association of the sound of the drum with the performer’s gesture is an act of creative imagination (even though many such associations become familiar idioms). Then too, *Circumstances* may include information that goes well beyond the scope of the EVENT schema, information that enriches the general pattern of the EVENT with context and associations. For example, the *Circumstances* may not only include information about the sound object, but also associations with typical locations for such an ‘event’.

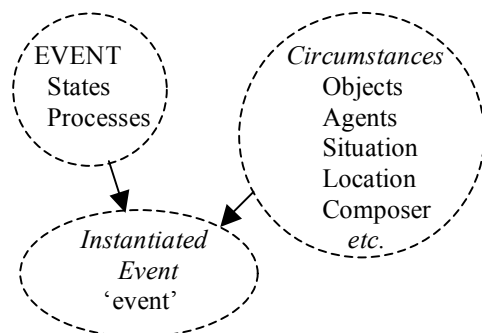


Figure 8. The binding of EVENT with *Circumstances* to form an *Instantiated Event*.

EVENT and *Circumstances* are a pregnant combination that quickly gives birth to the ‘event’, the *Instantiated Event*. This *Instantiated Event* is the result of a mental act that binds the EVENT schema with the *Circumstances* and blends the information of the *Circumstances* with the pattern of EVENT. Understanding the creativity involved in binding EVENTS and *Circumstances* makes it easier to

understand how the notion of ‘events’ is extended in a metaphorical fashion. Once the combustible ingredients of EVENT and *Circumstances* are brought into proximity, the creative products multiply. Then too, the particulars of the combination create a rich domain for artistic association, especially when the elements of the *Circumstances* create unusual or unprecedented combinations, such as Normandeu’s merging of a cello and a hurdy-gurdy in *StrinGDberg* or Dhomont’s references to Machaut and Schaeffer in *Novars*.

4.2 Gist

Clearly one of the common challenges in listening to electroacoustic music is the experience of a situation that is difficult to assimilate in realtime. This could be a passage with many simultaneous streams of ‘events’ or one in which the relationships between ‘events’ is particularly difficult to follow. Whatever the situation, in-depth listening to electroacoustic music often surpasses the listener’s mental resources of the moment. But even when ‘events’ cannot be completely assimilated, the listener can hold onto the ‘gist’ of ‘events’ [1]. Fig 9 shows the sonogram of a short segment of Dhomont’s *Novars*. There are two components in the texture. The more continuous one concentrated in the bottom third of the graph is a stream of particles taken from Machaut’s *Masse de Notre Dame*. Just as in the case of the grains in *Riverrun*, it is far more meaningful to focus on the ‘gist’ of the entire assembly, rather than individual particles.

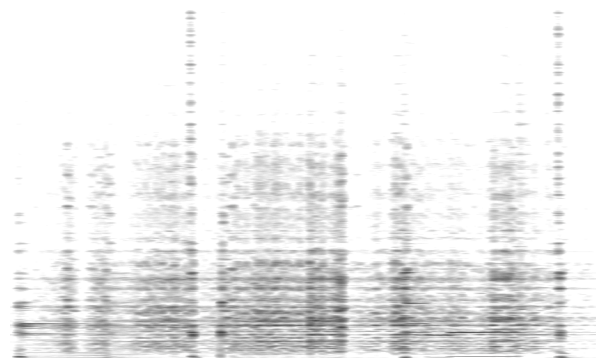


Figure 9. Sonogram of Francis Dhomont’s *Novars* from 2’ 58” to 3’ 35”.

The situation of incomplete assimilation reveals that listeners are always constructing the ‘gist’ of ‘events’. ‘Gist’ is often described as what the perceiver acquires from a brief glimpse of something and usually includes the most salient features of the situation. In that sense, the ‘gist’ of the excerpt from *Novars* includes the juxtaposition of the bright, filter-swept chords with their irregular rhythm against the cloud of vocal particles with its rough outbursts. The formation of the ‘gist’ is essentially automatic and nearly instantaneous. Its content typically includes perceptual features and conceptual relationships. (It is awkward to generalize very much about auditory ‘gist’ because it is understudied in comparison to visual gist or gist memory.)

‘Gist’ enables the listener to construct a working hypothesis and to keep up with the realtime flow of ‘events’ even when the details cannot be absorbed. It is a kind of abbreviation for what is going on. ‘Gist’ guides the listener’s attention to a *focal layer* which tends toward the listener’s foreground just as ambience tends toward the background. In that sense, ‘gist’ is the fundamental essence of our ongoing construction of meaning in sonic art including a sense of foreground/background relationships.

4.3 Incomplete Circumstances and Art

In acousmatic music the *Circumstances* of an ‘event’ are often intentionally impoverished in comparison to situations in everyday life. Because the basic information about the sound source and context may be unknowable, the listener’s attention is shifted to the elements of the *Circumstance* that are clear or to the specific characteristics of the EVENT schema itself (such as the dynamic flow of resources). In such ways our everyday habits of listening to ‘events’ are broken and reshaped for artistic purposes. Smalley discusses acousmatic source identification in terms of *surrogacy* that ranges from first-degree to remote [11]. It is important to recognize in these situations that the listener is still able to grasp the ‘gist’ of the ‘event’ despite its remote relationship to everyday experience (though the act of listening might require more effort). In this case, the lack of information about the source is not only intentional, but also clearly part of the artistic content of the work. The EVENT schema provides a context for meaning even when *Circumstances* are incomplete. It gives cognitive support to the seeming abstraction of the ‘objet sonore’ [10]. Clearly, an essential aspect of artistic expression is the intentional abbreviation, the situation in which the lack of information highlights content and engages the imagination of the listener.

5. CONCLUSION

We have explored the concept of ‘event’ in relationship to electroacoustic music and especially in relation to its artistic content. This exploration has produced a rich set of outcomes, ways in which the act of understanding electroacoustic music is illuminated and its hidden mental processes are made evident. Artistic play with sonic material and organization is a hallmark of electroacoustic music and we have observed how artistic content is generated by play with the properties of the ‘event’ such as its causality and its resources. Most importantly, we have observed the creativity by which listeners bind the EVENT schema with the *Circumstances* of the moment, facilitating artistic abbreviation and widening the scope of imagination. In these ways, we come to a deeper understanding of electroacoustic art. But, this exploration of ‘event’ must be understood as just one element in the broad consideration of artistic meaning in electroacoustic music. The situation becomes particularly more complex when we consider what we might term *structural events*.

This was already suggested when discussing the juxtaposition of materials as an ‘event’. Such ‘events’ are often made visible by factors not considered in this discussion. Even so, the consideration of ‘event’ is an essential component of a comprehensive understanding of the cognition of electroacoustic art.

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