マグヌス・リンドベルイの〈アクション－シチュエーション－シグニフィケイション *Action-Situation-Signification*（1982）〉における音の構造に関する考察
――ピエール・シェフェールとヘルムート・ラッヘンマンの音の分類方法に基づいて――

A Study of Sound Structure in Magnus Lindberg's *Action-Situation-Signification*: Based on Pierre Schaeffer's "Tableau Récapitulatif de la Typologie"

アム・セチュン・トニー
UHM Sechun Tony

マグヌス・リンドベルイ　Magnus Lindberg（1958-）は、フィンランドを代表する現代作曲家のひとりである。80 年代のリンドベルイの音楽的実験に現れている特徴の一つは、音色を中心とする作曲方法である。このような音楽的実験が反映されている作品として、1982 年に作曲された〈*アクション－シチュエーション－シグニフィケイション　Action-Situation-Signification*（1982）〉が挙げられる。この曲は、様々な特殊奏法によって作り出されてくる多様な音色が核になっており、バスクラリネット、ピアノ、パーカッション、チェロ、テープで編成されている。

この作品の音作りについて、リンドベルイを研究したリスト・ニエミネン　Risto Nieminen は、ピエール・シェフェール Pierre Schaeffer (1910 － 1995) の『音楽オブジェ論 Traité des Objets Musicaux: Essai Interdisciplines』に叙述されている音の分類に影響を受けていると指摘している。その他にも、シェフェールがこの作品に及ぼした影響について言及している文献はあるが、実際的な楽曲分析により、その影響がどのような形で現れているのかを検証しているものはないらしい。

本稿では、シェフェールの音に対する概念を考察した後、それに基づき〈*アクション－シチュエーション－シグニフィケイション*〉を分析した。その上で、音作りにおいてリンドベルイがどのように彼のアイディアを自分の作品に生かしているのかを検証した。

1. Introduction

The Finnish composer, Magnus Lindberg (1958-) is one of the representative figures of contemporary music today. His key work *Kraft* (1985), a large-scale piece scored for a soloist ensemble, huge orchestra and live electronics, reveals his unique compositional language known for its great vitality and vigor. The large number of junkyard percussion instruments (e.g. metal scraps, stones, etc.) that constitute the soloist ensemble, are assembled together to form huge sound masses and impart enormous energy to the music.

One of the distinct qualities of Lindberg's compositional practice in the 1980s is to be seen in his

exploration of timbre; the piece, *Action-Situation-Signification* (1982) can be held up as an example to illustrate this. Lindberg experiments with diverse timbres in this work, written three years prior to *Kraft* and scored for bass clarinet, piano, percussion, cello and tape. He actively makes use of various extended techniques for the respective instruments (e.g. blowing into the instrument, rubbing the tam-tam with styrofoam and etc.) so as to push the boundaries of their potentials. As a consequence, the palette of sounds is vastly expanded generating great numbers of unorthodox sonorities.

According to Risto Nieminen, in carrying out the sonorities and classifying the sounds, Lindberg based his ideas on the sound classification system of the French composer, acoustician and electronic engineer Pierre Schaeffer (1910-1995), drawn from Schaeffer's *Traité des Objets Musicaux: Essai Interdisciplines (Treatise on Musical Objects: An Essay across Disciplines)*[1]. Although Lindberg later perceived the German composer Helmut Lachenmann's ideas to be closer to his own[2], Schaeffer's ideas still prove to be the ones that exerted influence on the actual compositional process. While some articles mention Schaeffer's influence on the work (presumably based on Nieminen's account), sources that analyze the underlying influence in the actual music (its sound structures) are nowhere to be seen.

Accordingly, this paper aims to examine the sound structures in *Action-Situation-Signification* through the analysis of its score. The analysis was carried out on the basis of Schaeffer's sound classifications, which proved to be a useful guide in gaining a deeper understanding of the music. Ultimately, the main objective is to discuss Schaeffer's concepts, and, by providing examples, observe how Lindberg makes use of them in his composition.

2. Background

Action-Situation-Signification was composed in Paris in 1982. It was written for the Toimii Ensemble, an experimental ensemble founded in 1980 by Lindberg himself with some other fellow musicians (including Esa-Pekka Salonen, Anssi Karttunen, Otto Romanowski, and others). It was founded upon the idea of discovering new ways of creating music. The ensemble was more like a laboratory for composers, instrumentalists and artists of different disciplines, where they were able to freely conduct new artistic experiments. Lindberg benefitted from this greatly, as the unit proved to be a great vehicle for Lindberg's musical experiments – not to mention that it also gave the premier of *Kraft*.

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[1] Risto Nieminen, "Works," in *Magnus Lindberg,* tr. Nick Le Quesne (Helsinki: Finnish Music Information Centre, 1996), 87. Hereafter, the English translation of Schaeffer's work will be referred: Pierre Schaeffer, *Treatise on Musical Objects: An Essay across Disciplines*, tr. Christine North and John Dack (Oakland, California: University of California Press, 2017).

[2] Nieminen, *Works*, 87

In *Action-Situation-Signification*, Lindberg first explored musique concréte – an invention of Schaeffer – although with a slightly altered approach from the original one[3]. At the ending of each key movement (i.e. The Sea, Rain, Fire and Wind[4]), the instrumental music is met with sounds recorded in nature (e.g. recording of waves of the sea). The sounds of the tapes operate as the central elements of the music while they also serve as the model for their instrumental counterparts. In relation to this, the English composer Julian Anderson (1967-) writes as follows:

> Every aspect of playing technique is covered in music of raw, frenetic energy, which periodically coalesces into the recorded sounds of sea, rain, fire and wind, the acoustical properties of which govern the work's four movements[5].

The inner contents and hidden forms of the recordings are to be turned into instrumental music. Thus, in lieu of bringing the collected materials together as a collage of sounds (as would be done under the original principle of musique concréte), Lindberg juxtaposes his instrumentals with the samples. As a consequence, continuity is built around two subject matters, giving rise to a relationship between natural phenomena (sound recording) and human reaction (the performance) as a musical metaphor. Moreover, this relationship alludes to the extra-musical associations of the work – namely the "action" and "situation" mentioned in the title. The "situation" is revealed through the recordings, while the musicians' activities represent the "action" part, whereby "the situations are energized and, according to the composer, produce meaning ("signification")"[6].

3. Pierre Schaeffer - <Typology-Morphology>

As mentioned above, Pierre Schaeffer was a French composer, acoustician and electronic engineer. He worked at a radio station named Radio télévision francaise (RTF), where he also carried out his research on sounds. His most important treatise, entitled *Treatise on Musical Objects: An Essay across Disciplines* (published in 1966), focuses on the relationship between music and technology, drawing upon his experiences in the recording studio. In the fifth chapter of the treatise, his sound classification is put forward as a table called, *Summary Diagram of Typology (Tableau Récapitulatif de la Typologie)* – the chapter is titled *Morphology and Typology of Musical Objects*[7].

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[3] Schaeffer's principle of musique concréte emphasizes the assemblage and modification of the recorded sounds.

[4] The names of all the movements, in order: 1. *Earth I*, 2. *The Sea*, 3. *Wood*, 4. *Rain*, 5. *Metal*, 6. *Fire*, 7. *Wind*, 8. *Earth II*

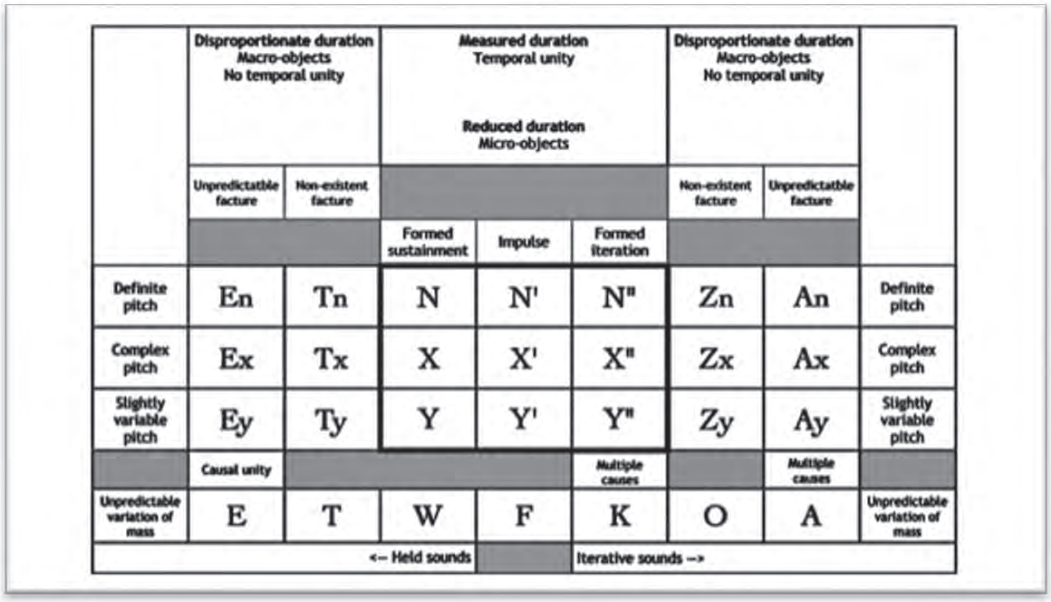
[5] Julian Anderson, "The Spectral Sounds of Magnus Lindberg. Julian Anderson Introduces One of Scandinavia's Leading Composers," *The Musical Times*, Vol. 133, No. 1797 (Nov., 1992): 565. JSTOR (1002573)

[6] Nieminen, *Works*, 87

[7] Pierre Schaeffer, "Book Five: Morphology and Typology of Sound Objects," in *Treatise on Musical Objects: An Essay across Disciplines*, tr. Christine North and John Dack (Oakland, California: University of California Press, 2017), 307

For this essay, the revised version by Robert Normandeau (1955-) was used due to its enhanced practicality[8]. The table is as follows:

The table: Summary Diagram of Typology
(Revision of the original by Robert Normandeau)[9]



	Disproportionate duration Macro-objects No temporal unity		Measured duration Temporal unity / Reduced duration Micro-objects			Disproportionate duration Macro-objects No temporal unity		
	Unpredictable facture	Non-existent facture				Non-existent facture	Unpredictable facture	
			Formed sustainment	Impulse	Formed iteration			
Definite pitch	En	Tn	N	N'	N"	Zn	An	Definite pitch
Complex pitch	Ex	Tx	X	X'	X"	Zx	Ax	Complex pitch
Slightly variable pitch	Ey	Ty	Y	Y'	Y"	Zy	Ay	Slightly variable pitch
	Causal unity				Multiple causes		Multiple causes	
Unpredictable variation of mass	E	T	W	F	K	O	A	Unpredictable variation of mass
	<– Held sounds				Iterative sounds –>			

Initially, to elaborate on this table, it is important to draw the attention to the column placed at the very center (i.e. the column where the N', X', Y' are placed). This column is called *impulse*. It describes the micro-objects, which can be described as sounds that occur in an instant. The classification generally stems from this point based upon the following three groups of criteria:

(1) mass – facture

(2) duration – variation

(3) balance – originality

The four horizontal rows are divided into two groups:

※ The three rows above indicate natural sounds

※ The fourth row below the three indicates artificial sounds

[8] The few changes applied by Normandeau seem more intelligible for readers. For instance, replacing homogeneous sounds (H) – which was placed at the second column from the left in Schaeffer's original version – with drone (T), seems to provide a more solid description of the sound type. In addition, Normandeau translates the French word 'trame', which is what the (T) stands for, into the word 'drone', which is rather more straightforward and easy to understand. (See 3.4 Typology of the Sound Objects)

[9] Robert Normandeau, "A revision of the TARTYP published by Pierre Schaeffer," Electroacoustic Music Studies Network, accessed June 18, 2019, http://www.ems-network.org/IMG/pdf_EMS10_Normandeau.pdf. 11.

The direction along the horizontal axis represents the types of sounds:

※ To the left – held sounds (formed sustainment)

※ To the right – iterative sounds (formed iteration)

3.1. Mass – Facture (Morphological)

Mass applies to the vertical axis of the table, which simply represents the types of pitches. These are placed as follows from top to bottom: *definite*, *complex*, *slightly variable* and *unpredictable*. The other morphological criterion is the *facture*. This shows the manner in which a sound gradually develops: *formed* (developing in a predictable pattern), *non-existent* (no temporal development) and *unpredictable* (developing in a random way).

3.2. Duration – Variation (Temporal)

Duration describes literally the duration of the sound (as one perceives it). In addition, changes in accordance with time – proportional to the *duration* – are called *variation*. They are also divided into three types: *formed, non-existent* and *unpredictable*.

3.3. Balance – Originality (Structural)

The nine cells at the center represent the *balanced* objects. They are "neither too elementary nor too structured."[10] In a nutshell, this means that the objects that fall into this class are not too simple or overly complex, and hence maintain balance – not to mention optimum duration. Following this is the measure of *originality*. In classes that fall outside of the nine cells, attention is drawn to the temporal changes of the sounds, which are related to the morphological and temporal criteria as well. Here, the measure of *originality* is determined by how much surprise a sound is able to cause; thus, the more complex the changes are, the greater the *originality* becomes. This is divided into two criteria: *predictable* and *unpredictable*. Also, notice the classes are respectively labeled with a capital letter followed by a lower-case one. The lower-case letter indicates the type of pitch (e.g. the class *En* means *eccentric sounds with definite pitch*).

3.4 Typology of the Sound Objects

The following chart describes the respective cells (namely, the types of sound objects) and the symbols that are in use:

[10] Schaeffer, *Treatise on Musical Objects*, 345

N	Balanced object: definite pitch	**A**	Accumulation
X	Balanced object: complex pitch	**W**	Large Note
Y	Balanced object: slightly variable pitch	**F**	Fragment
T	Redundant held sounds: e.g. drone	**K**	Cell
Z	Redundant iterative sounds	**O**	Ostinato
E	Eccentric sound	**“**	Iteration
‘	Impulse		

The typology system cannot be claimed as being an absolute criterion for defining all sound phenomena. However, through the phenomenological lens, it certainly is capable of providing a strong conceptual framework for interpretation of sound types. With the help of this system, it is possible to consider each sound as an individual object, enabling one to analyze their respective characteristics. Additionally, the musical tendencies of the classification system should not be overlooked, because the classification was designed with the intention of making music; Schaeffer states before classifying the sounds, “In the first place we want to use sounds to make music.”[11] All of these allude to the classification’s quality as a reliable guide for analyzing sounds, especially with respect to its musical associations; it has proven to be useful in the following analysis.

4. The Analysis of M. Lindberg’s *Action-Situation-Signification*

Before delving into the piece, it should be stressed that this classification was utilized as a means to achieve Lindberg’s compositional objectives. Therefore, it is necessary to discuss not only where and how the sound materials were employed, but also what they accomplish musically as a result. This is to underline the significance of the classification for its musical functions, as well as its aesthetic value. Also, the main focus will be placed only upon the key examples, those that are able to speak for the observations.

Lindberg’s use of the *impulse* seems to be open to interpretation. In many instances, when a sound occurs in an instant, it is left to resonate, although the duration of it may be very short. Since Schaeffer specifically explains what an X’ (*impulse*) sound should be – i.e. “struck and immediately muted”[12] – consideration should be given to this type of sound. Even so, there are few instances that are convincing enough to call them as such, and one example will therefore be given here. In the first movement *Earth I*, there is a place where a snap of the fingers (i.e. N’ in the center column) by the clarinetist can suddenly be heard (figure 1). This is particularly striking because it is heard at the heart of the transitional phase that directly connects to the climax. Additionally, at the very

[11] Schaeffer, *Treatise on Musical Objects*, 342

[12] Schaeffer, *Treatise on Musical Objects*, 356

moment of the *impulse*, all the attention is called to it, which makes the event stand out all the more. This hints at the importance of the structural aspect of music, which, to a great extent, governs its horizontal unfolding. Its ability to magnify the effect of the musical materials is, hence, justified.

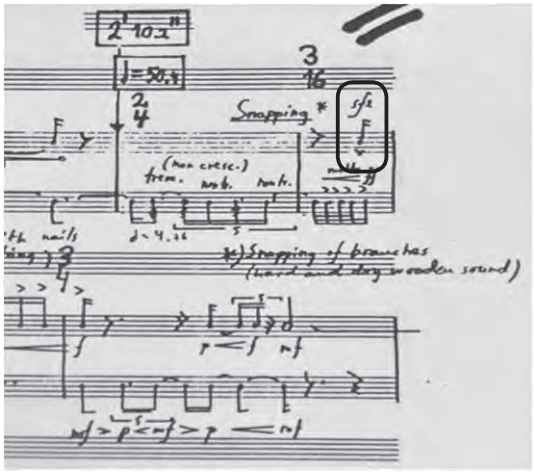


Figure 1. Snap of the fingers by the clarinetist

For the *mass* criterion (the *facture* criterion will be discussed later), the example from the second movement, *The Sea* will be discussed. In this movement, the music evolves around numerous recurring passages of 'buildup and release' – analogous to 'tension and release' in tonality. The buildups accumulate the momentum (i.e. predominantly consisting of fierce and robust materials), and the releases emit the energy (i.e. a sustained note usually playing a tremolo or trill), so there is a certain elasticity involved. This reinforces the intensity of the music, and, all the while, Lindberg employs both *definite* and *complex* pitches along the way, going back and forth from one to the other. This gives a feeling of fierceness, as if the sounds are constantly battling against each other to return to well-formed *definite* pitches, but they keep falling back; some of them even fade away at some point (see figure 2). Such applications bring forth intensity in the piece, imparting dramatic vitality.

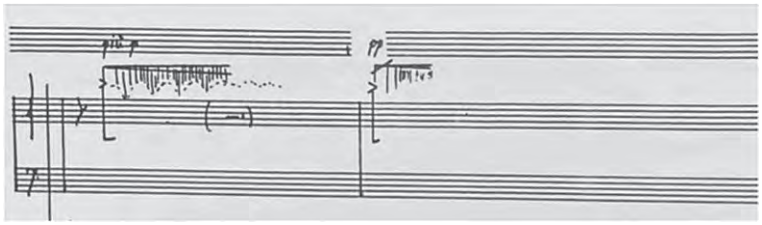


Figure 2. The piano fading away from the scene

The horizontal unfolding, with the alternation of the *masses*, calls attention to the temporal aspect of the piece, namely the *duration-variation* criterion. A distinct feature of the piece is that it does not involve any rests. This, in conjunction with the alternation of the *masses*, forms continuity around the musical flow – it turns the piece into a continuum of ever-repeating/changing musical events. In this respect, the piece can be referred to as a sound composition, whose characteristics reflect, to a certain degree, the sound class *E* (eccentric sounds). The recurring 'buildup and release' passages accumulate into a continuous whole that can be thought of as an extended line (i.e. the *duration* of an assembled sound object). At the same time, the accumulated musical events are put together so as to constantly challenge one's expectations, causing numerous surprises (i.e. *variation*) along the way. For instance, a piano passage that begins at the point of 3'40.75" (see figure 3), starts off with a whole note playing a chord (*object N*). It is immediately followed by a sound generated by scratching of the strings inside the piano (*object X*), after which a sudden drop of a ball onto the string (*object X"*) interrupts the flow, causing an unexpected surprise. Moreover, immediately after this, the music is met with definite pitches (*object N"*) again, although this time the materials are *iterative*. These variations that consist in an ever-continuous line of musical events (*duration*) govern the structure of this work, whereby a continuum of sound events is established.

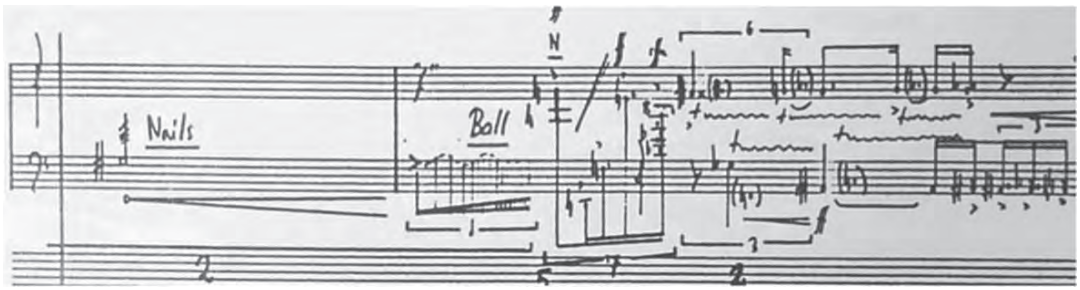


Figure 3. The entire phrase

Moving on, one of the interesting uses of the *facture* criterion is to be seen in the succeeding movement, *The Wood*. The instrumentation of this short piece consists of five different pieces of wood, namely those that produce high and low pitches (indeterminate pitches). Generally, the distinct feature is that the *facture* of the sounds is unchanging throughout the piece; it is merely repeated. According to Schaeffer, a *redundant* sound can be acquired by extending a note long enough until the dynamic form has vanished (this applies to all *mass* types)[13]. Lindberg seems to be well aware of this as his intention is reflected in the application of the materials. He uses only *iterative balanced objects* (i.e. rolls played on the pieces of wood) that appear in chain one after the other. They give rise to continuity as one object fades out, while the other emerges from it; so,

[13] Schaeffer, *Treatise on Musical Objects*, 356

it is as if the former material is giving birth to the latter. Conceptually speaking, this appears to be an extension of an *X" object*; hence, with time, the sound is likely to become *redundant* – not to mention that the sources of the sounds are the same as well (i.e. pieces of wood). However, because of the interplay between the *masses* (even though the pitches are indeterminate), the materials are given a new vitality. As a consequence, the repeated redundant facture does not sound redundant anymore – an irony is created. Although it is the interplay between the *masses* that actually achieves this irony on the surface, the repetition of *redundant facture* exists as the precondition – that is, the very cause of the irony.

In the movement, *Rain, balanced objects* make appearances as the predominant components in a unique manner. This connects to the very last criterion: *balance-originality*. During the early 1980s, Lindberg strove to achieve "as blocklike forms as possible"[14] in his compositions, and this movement is a good example that reveals such preoccupations. Although the latter part of the piece shows fluid movements, each blocklike section of the former part is labeled with a double barline at the end. The effect of such blocklike forms is that they bring the focus onto the very moment of each part. This, in turn, calls the attention to the individual components that comprise the respective sections. In this piece, many of the same/similar units of rhythm are shared between the instruments (played simultaneously), but they are put together in a specific way. While the layers of rhythm share related materials, their respective subparts are distributed to different instruments. This creates a unique sonority, which is generated by accenting different portions of the rhythmic units (e.g. one subpart is omitted from the piano parts, while that omitted portion is given to the cello, or vice versa). Through this means of accentuating the details, the *balanced objects* (or *impulses*) are subtly magnified, while the music is being propelled forward – it is reminiscent of falling rain (macroscopic) VS the individual raindrops falling on the surface (microscopic).

Lastly, the focus is on *originality*. The movement *Earth 1* will be held up as an example once again. At the beginning of *Earth I*, three different types of sound objects are introduced in succession. A tremolo of the sandpaper blocks and cello (*object Zx*) opens up the music, after which rhythmic figures on the sandpaper are introduced (*object X"*). It is difficult to draw an exact conclusion as to which cell this object could belong to, as the measures that contain it have rhythmic changes. However, these rhythmic figures (e.g. quintuplets) foreshadow the climax of the piece, at which they appear in a repetitive manner on the cello, clarinet and percussion instruments. Thus, for now, it can be classified as a *balanced object X"*. Finally, a sound object that belongs to the *Ex* cell (eccentric held note) is introduced on a metal string. This sound bears great originality as it is constantly changing over time. Not only that, since the other two counterparts (the sandpaper

[14] Magnus Lindberg, "Magnus Lindberg: A voice from the 1980s," Finnish Music Quarterly, published September 15, 1987, accessed August 17, 2019, https://fmq.fi/articles/magnus-lindberg-a-voice-from-the-1980s.

blocks, cello and sandpaper) lean rather towards *balance* and *redundancy*, its presence is further emphasized. Moreover, as the piece develops, the sources of the sounds change as well (i.e. grater against metal, rubbing the tam-tam with styrofoam and etc.); they generate harsher timbres, which bring out a greater presence of the *object Ex*. Hence, once again, it is noticeable that the materials are used in specific musical contexts by which the characteristics of the objects are intensified, in turn reinforcing the effects of the materials.

5. Conclusion

It is now clear, to a certain extent, how Schaeffer's *Summary Diagram of Typology* (*Tableau Récapitulatif de la Typologie*) has exerted influence on Lindberg's compositional practice. The examples put forward from the work *Action-Situation-Signification* may seem open to interpretation; however, they certainly show the marks of Schaeffer's ideas in Lindberg's explorations of sounds, especially in relation to their temporal features (i.e. how they change and evolve over time). Also, Lindberg's application of the ideas demonstrates the classification's musical inclinations and its theoretical accuracy in conceptualizing sounds. As a consequence, *Action-Situation-Signification's* sound structure can serve as a good model by which to gain insight into the manipulation of sound materials through attention to Schaeffer's sound concepts.

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Score

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