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UNIVERSITY OF CALIFORNIA, SAN DIEGO

In Pursuit of a Mental Model for the Architectural Interpretation
of Music in Performance

A dissertation submitted in partial satisfaction
of the requirements for the degree
Doctor of Contemporary Music Performance
in
Music

by

Katalin Lukács

Committee in charge:

Professor Aleck Karis, Chair
Professor Alain J.-J. Cohen
Professor Lei Liang
Professor Jane Stevens
Professor Gábor Tompa

2013

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The dissertation of Katalin Lukács is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

Chair

University of California, San Diego

2013

DEDICATION

To my family for their love and support.

TABLE OF CONTENTS

Signature Page.....	iii
Dedication.....	iv
Table of Contents.....	v
List of Figures.....	vi
Acknowledgements.....	vii
Vita.....	viii
Abstract of the Dissertation.....	ix
1. Introduction.....	1
2. The Architectural Performance and Interpretation	4
3. The Learning Process.....	10
4. The Multidimensional Mental Model	
4.1 Music and architecture.....	18
4.2 Sensation of space in music.....	22
4.3 The spatial aspect of the mental representation. The multidimensional model.....	24
4.4 The multi-dimensional model in performance.....	28
5. Application of the Multidimensional Model to Works of The Contemporary Repertoire.....	32
5.1 <i>Voicelessness. The Snow Has No Voice</i> by Beat Furrer.....	37
5.2 <i>Serynade</i> by Helmut Lachenmann.....	55
6. Conclusion.....	84
Bibliography.....	88

LIST OF FIGURES

Figure 4.1: Edgar Varèse's sketch for the <i>Poème électronique</i>	20
Figure 4.2: Diagram of the sound routes made by Iannis Xenakis.....	21
Figure 5.1: <i>Voicelessness. The Snow Has No Voice</i> , p. 1.....	38
Figure 5.2: Graphs of range, volume, tempo and density in <i>Voicelessness. The Snow Has No Voice</i>	45
Figure 5.3: Sound objects and phrases in <i>Serynade</i> , mm. 1-13	70
Figure 5.4: Sound objects and phrases in <i>Serynade</i> , mm. 14-25	71
Figure 5.5: Filtering of resonances in <i>Serynade</i> , mm. 1-25	73
Figure 5.6: <i>Serynade</i> , mm. 38-47	78
Figure 5.7: <i>Serynade</i> , mm. 145-172	80
Figure 5.8: <i>Serynade</i> , mm. 228-241	81

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VITA

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|------|---|
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ABSTRACT OF THE DISSERTATION

In Pursuit of a Mental Model for the Architectural Interpretation of Music in Performance

by

by Katalin Lukács

Doctor of Musical Arts in Contemporary Music Performance

University of California, San Diego, 2013

Professor Aleck Karis, Chair

This document addresses how musicians realize an architectural performance; one that conveys a clear mental image of the piece and brings a sense of space to the listener. I discuss the processes that lead to the realization of a multidimensional mental representation of classical music. Next I examine how the realization of this model applies to complex works of contemporary (late 20th century) repertoire, discussing in detail two works: *Voicesslessness. The Snow Has No Voice* by Beat Furrer, and *Serynade* by Helmut Lachenmann.

1. INTRODUCTION

The idea for this paper occurred to me after a lesson I taught to one of my talented young students. For a few months already I had been directing my student's work on a quite demanding piece, which I believed, was coming along really well, but still had a few stages of development ahead. During the lesson a series of questions came up about the state of the piece at that time and all the work that was still ahead of him. I had similar discussions in the past with this student, but they were not so in-detail and down to the core of the meaning of what practicing and knowing a piece really means. I realized during this lesson, that my student experienced frustration with the speed of the learning process. He was still not satisfied with his performance. Even after having worked on the piece extensively, from many angles, he felt his version was not sounding as good as the recording of X pianist.

As a teacher, I always explain my choices and reasoning to the students, so they understand why I am giving them a particular advice. I have learned that doing this is more constructive than just giving them indications on what to do next without informing the student about the reasoning behind the thought. This way I can give them an opportunity to learn, and maybe apply their new knowledge to another piece in the future. However, during this lesson I realized, that while my student was well informed about the solutions needed for learning music, he was too young and inexperienced about the entire learning process itself; about its intricacies, about the immediate and long-term goals that it involved. At the time of this lesson I launched into an inspiring talk about what I believed the ultimate goal of music-learning was; about how the learning process of a piece unfolds in time, on multiple levels. At the same time it also dawned on me, that my inspiring speech was the result of many

years of experience in the field, and not something that has been taught to me. I realized, that my view might be difficult to understand by someone who did not possess the same amount of experience; someone whose view of the process was more simple than mine: focused towards immediate goals and quick results.

We had a great discussion, even if my idea about the ultimate goal of learning might have sounded a bit outlandish. My student seemed inspired and more motivated to continue his work. But, this lesson left me thinking about a few issues related to music performance and music education, thoughts that have been preoccupying me since my undergraduate years. It made me wonder, at what point in their development do musicians come to a realization about the goal of the learning process, and ultimately the goal of music performance and, in my opinion, that the creation of a mental performance model for a piece is of great necessity. Secondly, if we performers and teachers agree on the fact that a performance model is necessary in order to produce a good performance, how do we convey this goal to the student? Most piano lessons - at least up to a quite advanced age - revolve around working out solutions to resolve localized problems. In my experience the necessity of allowing all the details to become a part of a greater picture is not being taught to students from an early age. More exactly, the emphasis on having a performance model in mind might be lacking from the instruction process. While learning a musical work can be a frustrating experience, not being aware of the ultimate goal of learning and the stages of development that can get us there can make the process more difficult and unrewarding. On the other hand, maybe if a student is taught to work towards developing a performance model and he is

involved in the process of creating it, he/she will become more willing to work and explore further possibilities of perfecting that model on his own.

The goal of my paper is to explain the notion of the performance model, and discuss the processes that help us create one. Since this subject is closely related to music psychology, I will make some references to papers that orient themselves towards the research of spatial perception in music. After a detailed discussion on the creation and the characteristics of the model, I will attempt to analyze/make projections on how the model behaves during the actual performance. Finally, I will bring up the question whether realizing an architectural performance can be possible in contemporary piano pieces. Detailed discussion of two works will follow:

Voicelessness by Beat Furrer, and *Serynade* by Helmut Lachenmann. I will address the possibilities and difficulties of arriving at such a model when learning these pieces based on my own experience performing these works. Lastly, I will try to draw some conclusions from the research I have done; some knowledge that will help me (and others) become a better piano teacher and mentor.

2. THE ARCHITECTURAL PERFORMANCE AND INTERPRETATION

All music listeners - whether musically trained or not - agree, that some performances we hear are better than others. Especially now, when recorded music is so omnipresent in our lives, it has become easier than ever for us to draw comparisons between several renditions of a piece. Our reasons for liking one performance versus another may vary based on multiple criteria: the technical/musical abilities displayed by the performer, the accuracy of the performance, the quality of sound produced, the truthfulness to the style/performance practice, and many others. In my opinion, all criteria mentioned above are very important when evaluating a performance. But, after having listened to thousands of live and recorded performances, I have come to the conclusion, that a truly great performance - one, that makes an impression on me that lasts a lifetime - is the performance, that contains the aspects mentioned above, plus one more, which can be as important as all of the others grouped together: in such a performance we get the sense that the performer has a great understanding of the piece, and a masterful plan of how the piece should unfold in time, all which he manages to convey to the audience.

Such a performance is very well-timed, well considered and weighted; each detail has its own well-defined quality and place in the musical construction and hierarchy. On the small scale, every note has its place within the musical structure, as much in the vertical sense, as well as horizontally. More exactly: in the vertical sense every note receives its due place within the harmonies of which it is a part, by having a characteristic timbre, color and intensity; while in the horizontal construction the notes clearly follow the function and emphasis assigned to them. On the large

scale, it is well balanced in its proportions, with a carefully thought out relationship between its parts. In this type of performance every technical and musical element has its role and place in the overall structure; no detail gets augmented for the sake of showing off the performer's abilities or to impress the audience. Over-emphasizing technical or musical aspects - the sort of "exquisite moments" that we sometimes hear in performances, that make some audience-members sigh - create a rift in the flow of the performance, producing a sort of "time-bubble," that distracts attention away from experiencing the structure of the piece. A great performance instead is well timed in its presentation, and unfolds naturally.

By the extraordinary clarity in all elements of interpretation - the dynamic weight, the progression from note to note in a phrase, the use of color, rubato, the clarity in the structuring of the piece - , this type of performance creates a sense of architecture, spatial feeling in the listener. It also brings a sense of awareness to the listening process by offering a well thought-out musical experience, within which the listener is aware of his location at every moment. On a personal note, if a performance possesses these characteristics, it becomes so powerful, that it gains an entity of its own. Unlike with other performances, where during the music I might contemplate the fact how the performer accomplishes certain technical or musical tasks, when I hear this kind of performance my mind is not busy with any extraneous thoughts. I am simply mesmerized, and I completely give in to the experience without questioning it.

To better explain my idea of a great performance, I have chosen a few musical examples. The first example is the *Aria* from Glenn Gould's 1981 highly

renowned and highly controversial recording of J. S. Bach's *Goldberg Variations*. I will discuss only the Aria from this interpretation since an analysis of the work in total would be enough for a paper in itself, especially when compared to his other recording of the work. Instead, I will present the Aria as an example of a small-scale, well thought-out, architectural performance. To further make my point, I will draw a comparison between Gould's recording of the Aria, and the recording of the same piece played by the Hungarian pianist András Schiff. This second recording is also a good rendition of the piece, but from my point of view it does not possess the same organizational character - clarity in structure and timing -, that would make it an architectural performance and give the listener a sensation of space in the musical experience.

This recording of the Aria in Glenn Gould's rendition, while its slow pace is rather unusual, it is amazing in the clarity of its construction. When listening to his rendition of the Aria, we are able to discern harmonic notes from passing notes, apoggiaturas, embellishments due to the tone color, and the varying degree of emphasis placed on them. I believe, that by choosing such a slow tempo, Glenn Gould grabs the listener's attention and draws us in, so we listen very closely, and hear every little detail of the musical structure. It is very difficult to make the music work at this slow speed, due to the limited sustaining ability of the piano, but Gould realizes it beautifully. The unusually slow tempo helps magnify Gould's interpretation of the musical structure, opening it up for the listener's enjoyment, and providing a full immersion in the experience. Listening to the Aria in Glenn Gould's recording is like experiencing a clear "sound image" of the piece. The listener needs to make no

effort whatsoever to understand it, he can just take it in.

The Aria in the rendition of András Schiff has a less architectural character from my point of view, and it provides the listener with a different experience. Schiff's quicker tempo contributes to the more global approach to the piece. At the tempo that he chose, we get to focus less on the note-to-note relationships, and more on the general phrasing. In that sense, it has a more sweeping, slightly Romantic character. Compared to Gould's recording, where every note "is alive" and has a different color and intensity according to its role in the vertical/horizontal scheme, Schiff's version sounds less polyphonic, less visceral in its intent of giving each and every note its due place in the overall construction and hierarchy. The vertical structure of the harmonies is less clear: the constantly moving voices are rather blended together, making it sound more like a melody with accompaniment.

The second musical example of a well-constructed, architectural performance is Gabriel Fauré's *Nocturne* No. 4 in E flat Op. 36 . The piece has an ABA form, and is based on a simple and beautiful melody that sounds like a song played on the piano with a chordal accompaniment. After its initial presentation, the undulating melody gets repeated in an octave augmentation, giving us a hint about what is about to follow. In the first recording of the piece, performed by the the largely unknown Brazilian pianist, Menininha Lobo, in this section the interpretation is kept to a minimum. It is played in a natural manner, following the rise and fall of the melody, while bringing out the harmonic tension inherent in the writing, which gives the music a sense of direction within the phrases and resolution at the cadences.

The opportunity to create an impressive sound structure arises in the middle -

in *Eb* minor - section of the piece. In this section, Fauré uses extrapolated layers of sound that consist of fragments of the initial melody and accompaniment to build up to an impressive climax. The initial downward leap of the melody is augmented, and becomes a sweeping gesture that constantly expands via repetition and harmonic development, while being supported by quickening accompaniment, which brings a sense of urgency and forward motion to the section.

Menininha Lobo builds up this section beautifully. In her performance, the accompaniment never overshadows the melody. We can always hear the melody's natural falling tendency pressing against the upward rushing accompaniment, creating layers of sonority that oppose or intertwine each other. She realizes the long crescendo building up to the climax by creating a vast expanse of sound, via the expansion of both the melody and accompaniment in volume, while always keeping the two in balance. This opens up the resonance of the piano, creating a spatial sensation in the listener.

The same piece in the recording of Kathryn Stott is somewhat affected in interpretation. In section A of the piece she often takes unnecessary time to emphasize musical elements that do not need to be emphasized, such as certain notes of the melodic line and in the resolution of cadences. It is a bit "precious" in its approach, and it prioritizes small scale detail versus presenting a clear picture of the musical construction. She also uses a lot of overlapping pedaling in this section, which very often creates a muddled effect of the harmonies.

The middle section of the piece in Kathryn Stott's interpretation is not as well thought out as the one we heard in the previous recording. She does not create a

sense of vast musical space; instead she brings the volume of accompaniment material to that of the melodic line, which makes the texture too heavy and dense, and not as clear and architectural as Lobo's recording. She also chooses to speed up the tempo to build to the climax. In her interpretation, this section becomes too fast and agitated long before the climax point, such that there is not much place for the piece to grow. Instead of opening up the piano's resonance and letting the piece unfold, the interpretation becomes aggressive. The *Nocturne* in Kathryn Stott's interpretation is still a good recording; but it is one that misses many opportunities to let the musical structure realize its full potential.

3. THE LEARNING PROCESS

How does a performer achieve that level of mastery, where he can create an architectural performance? To understand that, we need to investigate the learning process and understand the stages that lead to really knowing a composition. It is important to mention, that the learning process of a musical work can vary from one piece to the next. Each piece needs to be evaluated, considered based on its inherent challenges. Also, as we learn more music and acquire more learning strategies, our learning process changes. Our cumulative knowledge directly influences our future decisions, thus making our approach to each piece potentially a bit different. In the following section I will attempt to describe the learning process of a professional performer.

1.) The first encounter with the piece

Whether by listening, sight-reading, or just by looking at the musical score, the first encounter is an important step in the learning process, since it gives the performer an idea about the level of difficulty of the piece, and it can provide him with a lot of information regarding the work's musical and technical challenges. Sight-reading is usually the most common and most practical approach, since it provides a direct tactile/auditory experience. Sightreading also immediately brings up many questions about the piece (technical as well as musical), and it can provide many on-the-spot solutions - such as fingering and performance strategies - which are very helpful in the long run.

As it is the case with every mental process, the efficiency of sight-reading varies from person to person, or from one instance to another. From my personal experience I believe that there are different approaches/intensities to the sight-

reading process, depending on the performer's intentions and focus. On one hand it can be a somewhat automated process, when we just play what we see on the page. (I tend to do better when I do this.) At other times it is a more detail-oriented process. When I think too much about the details - all the theoretical, technical implications of everything I am supposed to do - the reading process becomes slower, and more learning-oriented. Knowing these two possibilities, when I sight-read something with the intention of learning it, I approach it more analytically. When I sight-read 'for fun', without the intention of immediately learning a lot of information about the piece, I try to turn off the analytical side of my brain. Sometimes I also take a different approach: I read first for fun - exploring the empirical, immediate side of the music; then I go back and approach the piece with a more inquisitive and analytical view. Second-time reading technically does not count as sight-reading, but if I categorize my first reading as a purely empirical, fun experience, which is guided more towards learning 'about the piece' rather than 'learning the piece', then second reading can fall pretty much in the same category. This illustrates how steps of the learning process are quite difficult to delineate clearly.

2.) The phase of purposeful learning and understanding of the piece

The second phase of learning begins after the initial acquaintance phase of the piece. It is during this phase when the performer takes a highly detail-oriented, analytical approach towards the piece, which is necessary to understand and realize the work's complexity (technical, musical, structural), and consolidate all that information into a strong performance model of the piece. During this phase, in the performer's mind a conscious deconstruction (analytical) and construction (unifying)

of the piece takes place, the two happening almost simultaneously.

- a.) Deconstructing processes: based on previous knowledge and learning experiences, the performer mentally analyzes the work, breaks it down to familiar elements that he can work with: fragments, patterns. This happens on two scales. On the large scale the piece gets broken down into its formal units (movements, sections, sub-sections) and harmonic segments (tonal centers, modulations, transitions). On the small scale it gets broken down into further sub-units (passages, note configurations), and harmonic units (chord progressions, sequences), that need to be worked out, investigated, magnified with the purpose of learning about them.
- b.) Constructing process: simultaneously with the deconstruction of the piece and an inquisitive look into its smallest details, the performer is engaged in a (re)constructing process of the piece, where all new and personal discoveries about the piece find their place in the big picture, thus realizing the mental structure of work from the consciously formed, polished smaller units.

The processes that are at work at understanding and working out one's own interpretation of the piece are so tightly linked together, that it is extremely difficult to delineate them clearly. The final goal of this deconstructing/constructing process is to understand every detail of the piece, down to the smallest detail, and to create a viable mental representation of it, with good performance strategies that will help in its execution. A more concrete version of this process could be the realization of the plans for an architectural structure. When making the plans - model - for a building, the architect needs to know all the building materials, elements and details that are involved in the making of the final structure, and have a clear plan on how the

construction will be executed.

In order arrive to a strong mental image and a good performance of the piece, a pianist needs to have good piano-technique, control of the instrument. The importance is twofold: mastering one's instrument helps the performer realize one's musical ideas, and allows him to further explore other possibilities of realization, which will ensure a better understanding of the piece, and a more advanced realization of the mental image and performance.

Young students, however, usually learn a piece in order to improve their technique and musicality. In their learning process the technical and musical aspects of the work are often separated. They are often taught to learn the technical aspects of a piece, execute it, and only later look for musical meaning in it, to add affect to their performance. While it might be necessary to use this layered learning approach in order to gain control over the execution of the piece, later in the student's musical development this method is not constructive to the understanding of the piece as a structure. Maybe the solution is to gradually change the student's learning approach from the layered to the unified learning approach, as soon as their technical and musical abilities develop enough to work on a piece both conceptually and physically. In the case of a somewhat advanced student who has good technique and has a pretty good knowledge of form and harmony the layered learning approach should already be avoided, and instead the importance of a unified learning process, that has the realization of a clear performance model and good performance strategies in mind should be emphasized.

Memory and perspective also play key roles in the understanding of the

piece, the realization of the performance model and its development in time. Making connections between abstract musical ideas, constructing the mental structure of the work all implies the use of memory. What more: memorization is an important step towards knowing a piece. It is a fact commonly known by musicians, that the performer really knows a piece if that piece has been committed to memory. In my opinion, there is a sizable difference between a performance that happens with the aid of the score, and one that is done from memory. When a piece is performed from the score, I have the impression that the complete command over the piece is missing. On the other hand, when a piece is memorized, I feel like the performance gains another dimension, a level of insight into it: it gets lifted off the paper and has a better chance in becoming an architectural performance. From the standpoint of the learning process, I consider memorization an important, but not the final step: I consider it the stage where the musician is able to perform abstract mental tasks on the piece, and on the performance model of the piece without having to play it on the piano, an important step in being able to realize the work's musical architecture.

Given the fact, that learning is a process that unfolds in time, perspective becomes a very important factor, not only at the architectural/construction level, but also in its further change and development in time, in the sense of time-perspective. While carefully considering every detail of a piece and determining its place and role in the overall structure requires an ability to shift one's perspective from the smallest detail to the construction of the big picture, an awareness of the development of the learning process, and having a time-perspective on the entire process is just as important. As frustrating as it might be, being a musician means working with an

abstract medium that is fluid, malleable, open to new insight and interpretation. As important as it is to have the goal of learning the realization of an architectural model of the piece, one has to be aware of the fact, that this model will change in time, as new insight is gained into the piece. In a sense, learning and the realization of this model is an always developing, spiraling continuum. And every performance, instead of being a final product, represents a snapshot of the performer's every effort that has come together until that moment, and in that very moment, in the performer's mind.

My belief, that we have to regard a musical work as a work of architecture, one which has a strong, personal model of interpretation came from my experience of learning one of my favorite pieces from the piano literature. In spite of being my favorite, it took me seven years to actually perform this piece in public.

Having studied at an art high-school and music conservatory, I have had several older colleagues who have studied the Liszt *Sonata* before me. I have also heard many performances of it, and owned several famous recordings of it- with Richter, Marta Argerich, Claudio Arrau. What more, my own sister learned it, and performed it numerous times. Needless to say, I got to know the piece really well, and I even deepened this knowledge during a few masterclasses I have witnessed, where my friends were coached by renowned artists from Russia and other countries. Before I even attempted to sight-read the piece, I felt I knew the piece extremely well, down to the details that had to be emphasized in certain lyrical passages, or make some technical passages really work. I really enjoyed the piece, but I had not thought of playing it, until my teacher who taught me during my Master

of Music studies handed me the score during the second week of studying with him, telling me that it would be a great piece for me. I did not think twice about it, and learned it very quickly. That project was accomplished in two weeks. (Learning the notes was not difficult in this case.)

When I performed it to my teacher, he was impressed by the speed I accomplished this task. And then he began questioning some of my choices in interpretation. Choices, which later turned out not to be mine. In the haste of wanting to learn the piece quickly, I did not give enough time to judge my decisions; decisions that have been mainly based on preconditioned knowledge, acquired by experiencing the piece through other people's lenses. At that point I realized, that what I was doing was a re-creation of other performances built on other musician's choices. I had made an arbitrary, quasi-Frankenstein version of the piece; my rendition of the Liszt *Sonata* was not original, since I was not the owner of the musical ideas I had about it. Therefore, in spite of being able to play the piece, I could not perform it. This realization set me back to square one. After a few months of work, which consisted mainly of discussing my choice about the piece and working out my version of the piece, I still had the feeling, that I was not able to come up with a viable version of it that I could call completely my own, so I abandoned it to work another piece, which was completely new to me. Needless to say, I did not encounter the same difficulty with the second piece, and within due time, I performed it on my masters recital.

Later, during the first years of my doctoral studies, when I had some time to work on tonal repertoire, my attention turned again towards the Liszt *Sonata*. This

time approaching it felt different and fresh. I have accomplished a great deal of work on it, and felt that I was getting closer to creating my own performance model of it. Two years later, when the opportunity came, I felt it was time to program it for a recital. It was an ideal companion piece for Philippe Manoury's *Première Sonate 'La Ville'*, which was inspired by the Liszt *Sonata*. Finally, I had - after seven years - managed to build up and call my own a version of the Liszt *B minor Sonata*. When I performed it, I felt that I managed to get to know the piece so well, that every note in it had its own meaning and role in the overall construction.

4. THE MULTIDIMENSIONAL MENTAL MODEL

4.1 Music and Architecture

The idea of similarity between music and architecture has been around for centuries. Architecture has been likened to "frozen music", while music has been described as "singing the architecture."¹ For me, the similarities between the two art-forms are quite stunning. Both work with materials that can be described in terms of volume/density/space/perspective/dimension. Experiencing both art-forms calls upon memory, and provides us with a way to experience time and space.

There are examples in the musical literature that have been composed with the goal of making a connection between music and architecture. One famous example is *Nuper Rosarum Flores*, a motet commissioned from Guillaume Dufay for the dedication of the new cathedral, *Santa Maria del Fiore* in Florence, on March 25, 1436. Another example are the works commissioned by the Phillips corporation for the opening of the Philips Pavilion at the Brussels World Fair in 1948: *Poème électronique* by Edgar Varèse, and *Concret PH* by Iannis Xenakis.

Dufay's motet contains references to the cathedral's structure and proportions by utilizing the numbers 6:4:3:2, and 4x7, or 4 and 7 in the motet's organization; combinations of which can be found in the proportions of the cathedral. It is interesting to mention, that at the time of the performance possibly only the musically educated elite might have been able to detect the connection between the music and architecture, beyond that of the dedication².

Varèse's *Poème Électronique* and *Concret PH* by Iannis Xenakis were

1 Marvin Trachtenberg, "Architecture and Music Reunited: A New Reading of Dufay's 'Nuper Rosarum Flores' and the Cathedral of Florence," *Renaissance Quarterly*, Vol. 54, No. 3, (Autumn, 2001), p.741.

2 Ibid., p. 772.

composed with the intention of being incorporated into a large-scale visual-sonic-architectural project, a sort of Gesamtkunstwerk, which was to be the Philips Pavilion. The *Poème* project was intended to showcase the latest technology by Philips. It was conceived by Le Corbusier as an eight-minute multi-media experience, which took place in an ultra-modern building designed by both Le Corbusier and Iannis Xenakis, with music composed by Varèse composed specifically for the site, and a movie projection realized by Philippe Agostini. Varèse's *Poème électronique* was written for the 350 loudspeakers installed in the building, and it consisted of pre-recorded sounds that were spatialized according to the building's dimensions³. As we can see from Varèse's sketch of the piece in Figure 4.1, the musical composition was clearly planned with the pavilion's paraboloid hyperbolas in mind. (See Figure 4.1)

3 Marc Treib, *Space Calculated in Seconds: The Philips Pavilion, Le Corbusier, Edgard Varèse*. Princeton, N.J.: Princeton University Press, 1996.

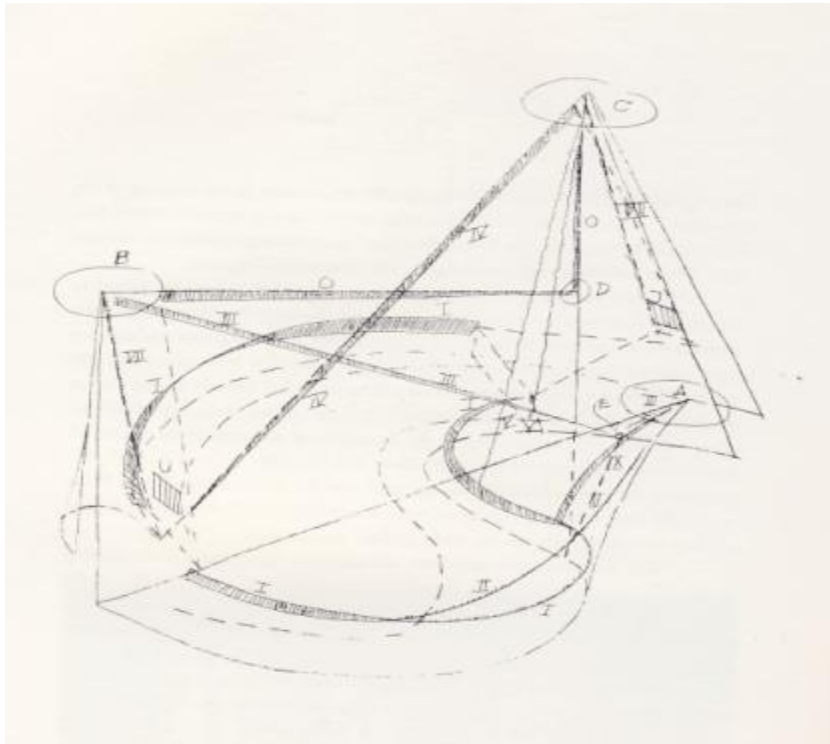


Figure 4.2: Diagram of the sound routes made by Iannis Xenakis

The *Poème* project has brought its audience an artistic experience that was new at that time. Unfortunately, the Philips Pavilion was demolished after the world fair. *Poème électronique* and *Concret PH* both survived on recorded media, and can be experienced even today. But there is no doubt, that the best way to experience both pieces was in the very space for which they were conceived, in conjunction with the architectural and visual elements for which they were conceived.

4.2 Sensation of space in Music

For me, listening to an architectural performance is similar to the experience of an actual work of architecture. However, in this case I am witnessing an abstract structure built with sound: it is like being inside a sonorous structure where the shapes and dimensions are created by pitch, volume, timbre, rhythm and resonance, instead of solid, tangible materials. Just like when visiting a cathedral, where I recognize familiar elements of the construction, such as the facade, column, levels, interior spaces, and so on, in the music I recognize familiar formal units, such as themes, modulations, variations, tonal relationships, and so on.

What is fascinating is, that both experiences rely on our sense of horizontal/vertical space and sense of depth, and - since both experiences unfold in time - the mental representations of both are created through perspective, with the aid of memory. As it happens when viewing a cathedral: we have to experience all exterior and interior spaces in order to have in our mind a clear mental representation of the building, which now becomes complete with all its details, from the smallest scale to the entire structure; when we listen to a piece of music, we perceive all its details as building elements that are part of a multidimensional construction, which is created in our mind as the piece unfolds.

While talking about our sense of space when experiencing architecture comes naturally, it is built into the medium itself; talking about the feeling of space in music is less obvious, even speculative. However, I will attempt to explain how in my view various aspects of our musical experience have a spatial component embedded in them. It is my view that imagining and describing music in spatial dimensions

helps me come to an architectural understanding of my interpretation of a piece of music. This architectural understanding of the interpretation of a piece allows me to create a more architecturally nuanced and balanced performance. I will describe the existence of horizontal and vertical musical space, the sense of depth in music, and finally the spatial aspect of the mental representation.

1. The notions of horizontal and vertical musical space are commonly known terms by musicians as well as music psychologists. By horizontal musical space we understand the beat-to-beat (and its subdivisions) organization of the piece, as it unfolds in time. Coupled with the notion of horizontal space I would mention the importance of rhythm, as it is the means by which the horizontal organization of music is realized. Together with rhythm, melody and its exponential counterparts, phrases, periods, sections, movements, etc. create the horizontal construction.

2. By vertical space in music we usually understand the relationship between notes that are sounded together. Such relationships are realized by counterpoint and harmony, which create a space between harmonic notes that is well defined by rules and conventions of music construction. What also adds to the feeling of vertical space is the harmonic range. It is somewhat obvious to the listener, that bringing the attention to a solo melody makes the listening experience more focused (centered), while an expansion in the harmonic range evokes the sense of openness in us.

3. A third type of spatial sense that we might feel when experiencing music is the sense of depth, which is created by volume. We can hear sounds in the foreground vs. the background based on their dynamic level. Also, when we experience a vast expanse of sound, we get the feeling of depth, broadness.

4. The fourth application of the spatial sensation in music can be found in the mental representation of our musical experience, namely in the mental model of the piece. I will present it in detail in the next part of my paper.

4.3 The spatial aspect of the mental representation. The multidimensional model

In my view, regardless of how we have acquired the mental representation of the music - by learning the piece, composing, or listening to it - it does have a spatial aspect.

The fact, that anyone who is knowledgeable enough about music to describe their musical experience in musical terms, is able to recall their listening experience and talk about events that took place within it, grabbed their attention, means to me that they have created a mind-model (interiorized model) of the piece, which is readily available for later analysis and introspection; listeners can readily access various components and aspects of it. In my opinion, the experience of listening to a piece of music in real time and space was recreated to a multidimensional image, which the listener is able to manipulate, augment or reduce in time at their own will. According to our liking, we can zoom in on the model and discuss small-scale elements of it, or we can zoom out and contemplate the balance of the form, or the interpretative decisions that helped shape it during the listening experience. We can perform a multitude of mental tasks on it: we can augment or reduce it, analyze, compare its building elements, even perform hypothetical operations on it. What more, we can mentally combine two interpretations of a piece by mentally comparing

their representation models in our mind, without having to listen to them again. All this - in my opinion- means that the mental representation of our music experience becomes a multidimensional model. Taking in consideration the spatial aspects of our musical experience, the model is at least 3D. If we think of the time element involved in music when we re-experience any aspect of this model in our mind, the model becomes 4D. Ultimately, all the factors that contribute to enriching the musical performance/experience and to the formation of a complex mental representational model - momentum, timbre, weight, balance - lead to realization of a multidimensional model.

What I call in my paper the “mental representational model” of a piece has been scientifically defined in music psychology as "musical imagery," and it has been defined as the capacity for the mental representation of musical sound in the absence of an audible sound source. It is not the experience of *real* music, but rather the mental re-experience, recall, or mental creation of a sonoric object or a musical process⁴. According to recent research in neuromusicology, musical imagery is very close to the actual experience of music, since the sensation of musical imagery results from the stimulation of brain areas that are active in sensory information processing. Using a method that provides an image which reflects areas of cerebral activities of a studied task, scientists provided evidence, that perception and imagery may share, at least partially, the same cortical neural substrate⁵.

I have found a few writings in music psychology and cognitive neuroscience

4 Marc Leman, "Modeling musical imagery in a framework of perceptually constrained spatio-temporal representations," *Musical Imagery*, Ed. by Rolf Inge Godoy and Harald Jorgensen, Pub. by Swets and Zeitlinger B. V. Lisse, The Netherlands, 2001, p. 57.

5 Ibid., pp. 58-59.

that support the idea of a relationship existing between musical and spatial processing. A study in cognitive neuroscience focused on the question as to whether apparently distinct perceptual abilities share computational or representational systems, suggested that pitch perception and visuo-spatial abilities have, at some level, a common spatial representation. A study of amusical ("tone-deaf") individuals investigated their ability to perform a visually presented mental rotation task of 3D shapes. The study found that amusical people were found to be significantly impaired in mentally rotating 3D visual shapes, while orchestral musicians displayed an enhanced ability at the same task. The researchers came to the conclusion that the inability to discriminate between pitches/identify melodies is strongly related to a deficit in spatial processing⁶.

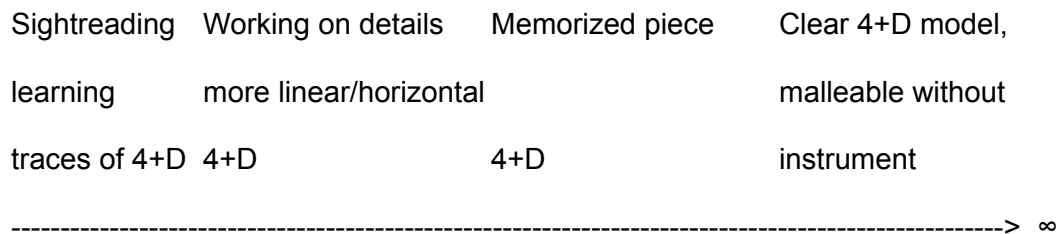
An article in the *Journal of Experimental Psychology* described an *fMRI* study on musicians, that showed that melodic and harmonic processing activates the inferior parietal lobules, the "spatial areas" of the brain. Because these areas are also activated in number comparison tasks, the finding suggests that shared areas are involved in number and in music processing. Added to their finding that musical pitch and numbers share similar spatial mental representations, these data may account for the controversial fact that music training increases spatial abilities⁷.

As a performer, I believe that the ultimate goal of music learning is to create a multidimensional mental representation of the piece we learn. I believe, that creating

6 Douglas KM, Bilkey DK, "Amusia is associated with deficits in spatial processing," *Nature Neuroscience*, 2007, Vol.10(7), pp.915-921.

7 Lidji P, Kolinsky R, Lochy A, Morais L., "Spatial Associations for Musical Stimuli: A Piano in the Head?," *Journal of Experimental Psychology: Human Perception and Performance* 2007, Vol. 33, No. 5, 1189 –1207, p. 1205.

this mental image can only happen as a result of a unified learning process, where there is no delineation between musical/analytical/technical work, but rather an overarching work on the piece on all levels. During the unified learning process the multidimensional development of the piece is the following: traces of the 4+D arise already at the beginning of the learning process, and gradually build up to form the multidimensional mental image, as the learning progresses. At the sight-reading phase some spatial elements, such as a sense for harmonic tension, melodic shaping, volume etc might be already present. At the second phase, as we have already made many decisions about the piece in order to have it memorized, the final image is shaping up. The last, and ultimate phase comes later, when we have the multidimensional model in our head, we can manipulate it in our mind, and think about it in the absence of the instrument. We can perform any mental task on it without playing a note. This ultimate mental image does change in time, since it is a model that we revisit, and reconsider at each encounter.



4.4 The multidimensional model in performance

As I have discussed before, having a clear mental representation of the piece is very important in the realization of a great performance. If the performer has a strong mental model of the piece, during the performance this model will transpire to the audience, who at their turn will be able to form a multidimensional mental representation of their musical experience. However, there are certain aspects of the performing process that have to be figured in when attempting to realize this mental model and convey it to the audience. Such factors are: the feedback from the instrument and performance space, and the moment's inspiration, both of which influence the outcome of the performance. (Contrary to popular belief, I don't think that wrong notes affect the realization of the mental model. I believe, that one can miss a few notes and still give a great performance, if it retains its architectural characteristics.)

Performing does not only consist of the simple execution of a well thought-out plan, an "unpacking" of previously thought-out ideas and performing strategies. On the contrary: performing is a highly complex task. During performance the musician is always thinking ahead, projecting the multidimensional model, while also executing the technical and musical details. Simultaneously with these mental and physical actions, the performer also has to listen closely to the sound produced, the feedback from the instrument and performance space; analyze to what extent the mental model has been realized, and make quick decisions about further actions necessary to realize a good performance. The performer operates simultaneously on many levels: mental, aural, technical, tactile and musical. What more: I would state, that

the performer operates in three time-dimensions: projecting the mental model into the future, executing the model in the present, analyzing the realized details from the present/near past, and - if necessary - adjust the plans for future actions to work with both projected model/realization. Someone who is not a performer might wonder, how is it possible to perform such a complex task. Accomplished performers have developed this ability during the course of practicing their instrument, and they consider it an absolute necessity in performance. While having a clear mental image of the piece is of crucial importance, the ability to function on all these levels - mental, aural, technical - , and in different time-dimensions is just as important for the realization of a great performance. Relying on this ability, the performer is able to judge how true to the mental model its realization has been realized, and if needed, adjust his performance strategies, and even certain aspects of the work's representational model.

The factors that most often impress change upon the multidimensional model and performance strategies are the quality of the instrument and the size/acoustics of the performance space. The following are some examples of situations when the performer needs to address the challenge of the performance space, the instrument, or both:

- When playing in a very big concert hall - especially when performing with a big orchestra - the performer might have to play up all dynamics of the piece.
- When performing a slow piece on an instrument that doesn't sustain sound very well might make the performer decide to choose a slightly faster tempo than the one previously envisioned.

-Performing on a piano that has a very light or very heavy action might make the performer change the tempi in fast sections to adjust to the challenges of the instrument. The pedaling might also change, based on the piano's resonance and the acoustics of the space.

While the acoustics of the performance space play an important role in the aural aspect of the performance, the most often encountered challenges are posed by the quality of the instrument. And - since pianists rarely get to practice a lot on the instrument they are going to perform - they need to possess excellent technique to make up for the challenges and shortcomings of the instrument, and realize the mental model as faithfully as possible.

Inspiration and momentary insight are crucial elements that are the key to learning and artistic interpretation. Since music is a medium that also relies on inspiration, we have to consider it as a factor that might impose some change on the realization of the mental model. As it is commonly known that one needs to perform a piece in order to get a better understanding of it (and to see how the mental model works in performance), we can accept that the performer might have a sudden revelation about certain aspects of the piece.

While it is important to acknowledge that there always be some factors that will impose changes on the realization of the projected model, it is imperative to realize that ideally the amount of deviation in performance from the projected model should be very little. One can only change very small details, those that do not influence the overall balance of the musical structure and its dimensions. In performance a certain amount of change might affect any dimension of the

performance model: time, speed, volume, timbre; however, one can only alter a limited number of parameters/dimensions, only small-scale details without ruining the balance of the model. Even when one makes some momentary adjustments based on feedback or momentary insight, these have to work with every other aspect/dimension of the performance.

Performance is not an opportunity to experiment, become self-indulgent, or to make arbitrary choices: the performer has to remain as true to the mental model as possible. If one doesn't follow the multidimensional mental model, one might lose the sense of structure of the piece, thus making the experience less compelling for the audience.

5. APPLICATION OF THE MULTIDIMENSIONAL MODEL TO THE WORKS OF THE CONTEMPORARY REPERTOIRE

Having a strong mental representation of a piece we intend to perform is just as important in contemporary music as it is in the traditional repertoire. However, the processes involved in realizing the 4+D model of this piece mentally and during performance might differ in some respects, but still be quite similar to the processes described in the case of classical music. What determines a new approach in the learning and performance process is the musical language and the compositional processes of the piece.

The most fundamental difference between classical and contemporary music lays in their musical language. Western art music is based on tonality, which has provided music a system in which it has evolved and expanded. Its concepts and formative elements - pitch and harmony - have conditioned our thinking of music. With the loss of tonality, contemporary music has challenged the understanding/definition of music by giving more - sometimes even primary - importance to elements that until then were secondary in the formation of music, such as rhythm, timbre, density and dynamic. The compositional tools, methods of organization of sound have also changed. Classical motives, phrases, periods and set forms are found rarely. Instead, composers use compositional processes that might vary from one work to the other. While the processes utilized in the composition might sometimes be obvious to the performer and listener, most of the time they are not. In spite of these differences, we can still make sense of the music, and realize a mental representation of it. All this owing to the fact, that while they might be using a different grammar and syntax, classical and contemporary music

share many aspects that serve us as guides in their listening/learning process and the forming of their representation.

In a study of the perception of boundaries in music, psychologists discovered that subjects with no or very little musical background used the same criteria to perceive segmentation boundaries in both Stockhausen *Klavierstück no. IX* and Mozart's *Fantasie in C minor*, K. 475. What guided the subjects in the perception of the musical boundaries were the parameters of rhythm, pitch, repetition, density, timbre, volume and silence. The fact that they might have relied more on a certain set of criteria while listening to the Stockhausen than while they listened to Mozart, is quite obvious. The experiment later required the subjects to locate certain extracted segments of the music in the structure heard before. The subjects performed on this task quite accurately. This experiment shows, that based on identical criteria in listening, listeners are able to form a mental representation of both classical and contemporary pieces⁸.

When learning contemporary music there might be few deviations from the phases of the classical learning process. The first deviation from the "traditional" learning process might already happen at the phase of the first encounter with the piece. In traditional music sightreading is the best way to get an idea about the piece. However, not every work of the contemporary repertoire can be sightread in the same sense as we understand this process in classical music. The notation and technical challenges of some pieces may not yield a very fruitful sightreading

⁸ Eric F. Clark & Carol L. Krumhansl, "Perceiving Musical Time," *Music Perception: An Interdisciplinary Journal*, Vol. 7, No. 3 (Spring, 1990), pp. 213- 251.

process, where one can not only grasp the work's difficulty, but also find solutions to some technical/musical issues. Nevertheless, sightreading is a useful approach in the learning of every type of composition.

The shift away from classical harmonic and formal compositional guidelines means, that every composition we approach might create its own universe, sound-world. Therefore; each piece might require an approach that is different not only from the traditional learning scheme, but also possibly from the learning process of every other contemporary piece. Naturally, we will always make a recourse to the learning skills we have accumulated throughout our musical life. But it also means, that the performer of contemporary music has to be flexible, inventive and positive in his approach to the learning process.

Another aspect of the learning process that might differ from the traditional scheme is the role of memory. While it plays a very important part of the learning process, the final memorization of the piece - the phase where we can perform the entire piece without the music - may or may not happen. There are quite a number of highly complex pieces that are extremely difficult to learn, let alone memorize with all details. There is no consensus among musicians on whether these works can/should be performed from memory. We see a great number of solo performances of contemporary music that is done with the aid of the score. While I sustain my previously expressed belief, that a piece gains another dimension once it has been lifted off the paper, I admit that the possibility exists that some details might suffer if such pieces would be performed from memory.

In spite of the differences in the musical language and challenges related to

the learning process, the process of realizing the multidimensional mental representation of a contemporary musical composition is quite similar to the way it happens in classical music. When we learn a classical piece we are able to place every information about it in a familiar framework. We might even be able to predict its musical and structural qualities. We do not have such references when learning contemporary pieces. However, our listening process and understanding of it is guided by mostly the same principles as in classical music: pitch, rhythm, repetition, density, volume, timbre, silence, etc. The study conducted by Krumhansl and Clark proves that individuals possessing no knowledge of these building principles are able to perceive structural reference points in contemporary music just as well.

In some contemporary works creating a perfect 4+D model might prove to be a difficult task, due to the complexity of the music. In some compositions traditionally encountered challenges are brought to a new level. Such challenges might be: a new or complex notation, an augmented technical or mental difficulty. In some cases - such as the works of Xenakis or Ferneyhough - it is even impossible to realize a perfect 4+D mental model in the sense presented the case of classical compositions. Works of these composers often present a level of difficulty that makes it impossible to process the work mentally, and technically execute the way it is written. I have found that when presented with insurmountable challenges, performers have two avenues to perform these pieces. The first option is to work out a version of the piece that is possible to execute; the second option is to attempt to approximate the music as written to the best of their abilities each time a performance is undertaken. Each of the two choices has a downside: in the first case, the performer might get

complacent about being able to play a version of the piece which in fact is not the actual piece; while in case of the second choice the performer might leave too much up to the moment's inspiration and not attempt to realize what is in the score. In such pieces realizing a perfect 4+D model and recreating it in performance would necessitate the development of new mental and physical skills.

Ultimately, when realized, the 4+D model of a contemporary composition will be vastly different from that of a classical piece. In classical music - as in traditional architecture - the final structure of a piece is achieved by a strong correlation between all building principles and materials used. Melody, harmony, counterpoint, form, together with all other elements of the music come together to create a balanced architectural structure such as a sonata, concerto, fugue, etc. On the contrary, contemporary music resembles contemporary architecture: it challenges the traditional rules of construction by its choice of building materials and the way these come together to achieve balance. At first impression, such a structure might seem disjointed, unbalanced. A relationship existent between all parts may not be in the foreground. What creates an overall sense of balance in this type of architecture is the strong relationship of cohesion/tension existent between its building elements, which makes them oppose/relate to each other. It is the performer's challenge to bring out these connections and realize the 4+D model of the musical structure.

5.1 *Voicelessness. The Snow Has No Voice* by Beat Furrer

I have chosen to present *Voicelessness* as a small-scale example of how my idea of creation and realization of a multidimensional model works in contemporary music.

Beat Furrer's *Voicelessness. The Snow Has No Voice* for solo piano was composed in 1986. As its title points to it, it was inspired by a poem of the American poet, Sylvia Plath, *The Munich Mannequins* the very last verse of the poem being the title of the piece. It is a hauntingly beautiful piece, that combines an interesting compositional strategy with unique sonorities, providing us with a unique musical experience.

The piece is written using a complex rhythmic notation. There is no "piano grand staff" indicating treble and bass clefs. Instead, it is somewhat like a canon: each line gets played in combination with the next line, which in turn is repeated in combination with the following line. Figure 5.1 is the first page from the score. This way line 1 is played with line 2, line 2 with line 3, 3 with 4, 4 with 5, and so on. What makes this notation complex is, that each individual line in the piece has its own time-signature, a feature that Furrer uses to notate complex polyrhythms and metric modulations. When we hear the first melodic line of the piece (Staff 1: the superposition of lines 1 and 2), we hear the superposition of two time signatures: 12/4 and 13/4. Staff 2 is the superposition of 13/4 and 14/4, etc. By doing this, Furrer notates complex polyrhythms: 12 over 13, 13/14, 14/15, which often occur in contemporary music. Moreover, by linking the staves together and repeating each line in combination with the following line, Furrer realizes metric modulations and

für Alfred Schlee
voicelessness
the snow has no voice (1986)
Sehr ruhig: gespannt-schimmernd
ppppp
Ped. ad lib.

beat furrer
 (*1954)

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Figure 5.1: Voicelessness. The Snow Has No Voice, p.1

builds up his piece in a unique way. This unique canon-like compositional technique allows him to realize a gradual development of the piece, where structure is achieved by the slow expansion in range, density and dynamics. (Other compositions where Furrer uses a similar layering compositional technique are *Lied* for violin and piano, composed in 1993, and in the 3rd movement of his *First String Quartett*, composed in 1984. In these compositions we encounter the superposition of two different tempi. However, the work's structure is not realized by the mean of linking the multi-layered staffs together.)

The superposition of the two lines and their respective rhythmic formulations - that consists mostly of divisions of triplets/quintuplets - leads to the realization of a texture, that is interwoven to a degree, that the listener is unable to distinguish one line from the other, or to sense a foreground-background relationship existing between the two lines. This tempo/rhythmical superposition of the lines also creates an ambiguity regarding the feeling of beat/tempo in most of the piece. Besides one section that presents a regular pulse, in most of the piece there is rarely a note that falls on the beat (quarter note), that our ears could "latch onto." When this occasionally happens, it does not create a sensation of pulse/tempo in us, due to the fact that its iteration is concealed by the rhythmic formulation of the other line, which happens at a different tempo, thus throwing us immediately off.

The extremely slow tempo and the dynamic of *ppppp* of the piece results in an almost muted, quasi non-productive piano-playing, that suggests the musical version of the voicelessness indicated in the title. The sound of the piano would be almost inaudible, in-understandable at this dynamic level if it were not for the

pedaling, that supports the wavering sound created by the overlapping lines. What also adds to the muffled/choked impression of sound in most of the piece is the close positioning of each layer's pitch material. By example, in the first line we hear the following pitches: middle C, E and their neighboring notes B, D#. The extreme closeness of these pairs of pitches (distance of a minor second between B,C and D#,E) almost gives the impression, that their purpose is to cancel out each other. The overlay of each line's rhythm in slightly different tempi results in a constant wavering between the two upper/lower pairs of notes, which gives the listener no sense of direction, or sense of hierarchy between the two groups. At first we might have a slight expectation to hear the leading tones move to resolve up. But this expectation is thwarted. Instead of establishing a relationship between the two groups of notes, their sonorities just co-exist, float together, being supported and possibly slightly shaped only by the resonant base of the pedaling.

There is another effect occasionally caused by the close proximity of the two layers' pitch collections that iterate their respective rhythmic subdivisions at two different tempi: notes that unintentionally come out of the texture, producing a sort of phantom-melody, a sort of shadow-play in the piece, that rises from the sound-texture. This melody is surprising to hear and unpredictable: it might happen in some performances, not in others; connections are made that the performer was unaware of before, depending on the timing correspondence/overlap/closeness of the subdivisions/rhythms. This phantom-melody adds to the mysterious character of the piece.

As the piece unfolds, the only moments of change that we perceive is the

entrance of new lines that behave like the musical equivalent of verses: building on the previous lines and adding new sonorities. The new lines, which constantly expand in register, gradually open up the space of the piece. At the same time, the rhythmic landscape also becomes busier. They gradually build up to a highpoint at a section where the rhythmic formulation of the overlapping lines are constantly inter-cutting each other, thus creating a dense texture of sounds.

After this highpoint, the rhythmic intensity and texture is gradually reduced to almost nothing, and the writing becomes very sparse. This drop in the level of activity slows down our feeling of time, and provides an opportunity to open up the resonance of the piano. We hear intervals and notes that remind us of the beginning sounds of the piece, spread across the entire range of the piano, iterating quite extreme dynamic levels. At a certain point - after one of the loudest events has sounded - all we hear is the resonance of the piano by itself, a disappearing sound-cloud; all activity in the music has stopped.

A sudden change disturbing the resonant landscape is the appearance of a very slow steady pulse. It is for the first time in the entire piece that we get a sense of the beat, let alone a pulse. This new element suddenly shifts the dimensions of the piece from multi-layered, irregular, spatial to regular and linear. It is almost like bringing the blurry image created by the piece to a focus, to an almost concrete image, and then back to indecipherable again.

Gradually, to this slow pulse other, quicker pulses are added, together with fragments quoting the first section. An agglomeration in the pulse layers creates yet another high-point in the piece at a point: each separate panel of pulsing rhythm

splits into multiple voices, each voice becoming an independent layer of its own, punctuating its own dynamic crescendo or decrescendo. This agglomeration of independent voices creates the impression of hearing multiple panels of sound shifting, moving in different directions. The variation in speed and the dynamic process exerted on each separate line brings a feeling of forward motion, momentum to this section.

After this second high-point, the pulse becomes gradually less present, and sounds from the beginning of the piece replace them, bringing back the the aura of timeless floating sonorities.

As we can see, the overall shape/structure of the piece is somewhat classical in its shape. It starts off with a slow, gradual build-up to a climax, after which it drops in intensity. Another climax is realized close to the end, after which the piece quiets down.

In *Voicelessness* Furrer's compositional strategy works the following way: if we choose the tempo of eighth-note = 40 for the first line, it translates to superpositions of the tempi of eighth-note = 40 and eighth-note = 43. Staff 2 is a line in 13/4 over 14/4, which means 43/46. Staff 3 is 14/4 over 15/4, which is 46/50. Staff 5 consists of 15/4 and 13/4, which is 50/43 in speed⁹. The metric structuring of the piece is the following:

Page 1

Staff 1: 12/13 at 40/43

Staff 2: 13/13 at 43/46

⁹ Tempo in this sense refers to rate of events, not beats per minute

Staff 3: 14/15 at 46/50* minor peak

Staff 4: 15/13 at 50/43

Page 2

Staff 5: 13/14 at 43/46

Staff 6: 14/14 at 46/46

Staff 7: 14/15 at 46/50

Staff 8: 15/16 at 50/53* busiest, fastest

Page 3

Staff 9: 16/15 at 53/50* beginning of the breaking down section

Staff 10: 15/13 at 50/43

Staff 11: 13/11 at 43/36* the slowest line of the piece

Staff 12: 11/12 at 36/40*

Line 13: 12/13 at 40/43

Page 4

Staff 14: 13/14/13 at 43/46/43

Staff 15: 13/12 at 43/40

Staff 16: 12/11 at 40/36

Staff 17: 11/10 at 36/33* end of the piece

As we can see, the gradation in tempo is realized in very small, almost imperceptible increments. However, the overall tempo shift achieved throughout the piece (40 to 50; 43 to 53, back to 36, then 33), is quite a change. I have marked the places, where a peak or culmination in tempo is achieved, with asterisk. The question is, whether these culminations in tempo can be sensed by the listener; whether all parameters work together to achieve that affect, or they negate each other.

The purpose of the graphs shown in Figure 5.2 is to illustrate the development/expansion of most parameters/dimensions of the piece - at least those parameters that can approximately be mapped - throughout the piece. These graphs are by no means the exact reduction/mapping of the piece's content and its development. It would be impossible to map all this information while also including the element of time, timbre, momentum, pitch, etc. That task can be accomplished only by the music itself. Alas, my graphs serve as visual aids in my analysis of each dimension's development and interaction/function in the the overall architecture.

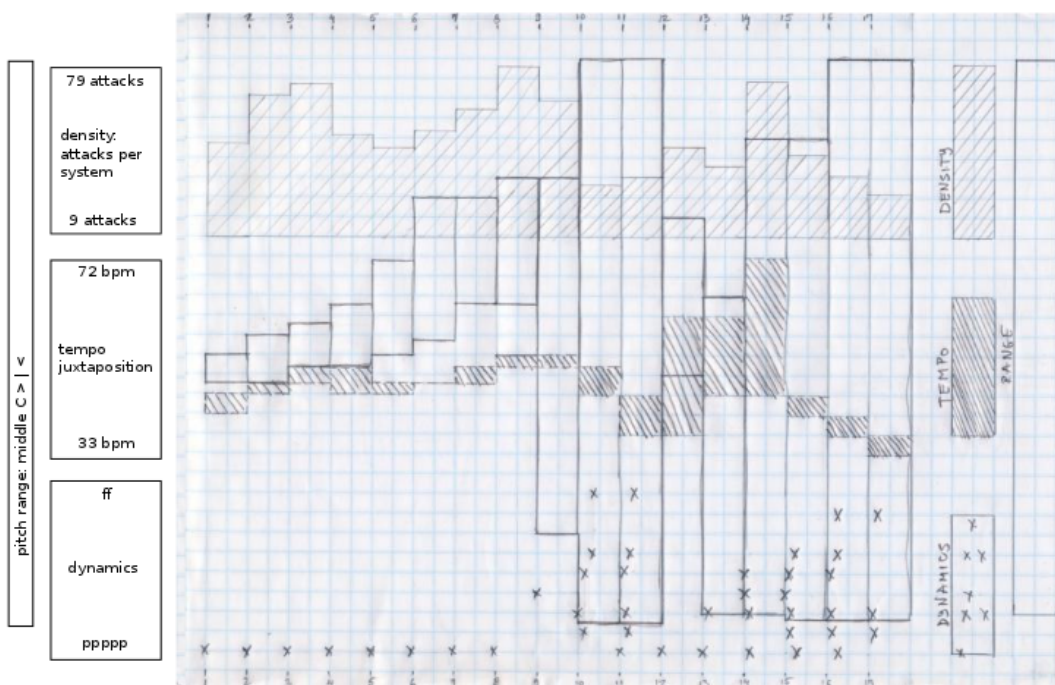


Figure 5.2: Graphs of range, volume, tempo and density in *Voicelessness. The Snow Has No Voice*

The shortcomings of my graphs are the result of attempting to separately visualize dimensions of the piece:

- The graph of range does not contain the time element: to show the expansion of range in the piece, I have only marked the elements of each Staff that inflict a change upon the range, are the new highest/lowest peaks. Their place of occurrence within the musical line is not represented.
- The tempo graph illustrates the changes in tempo throughout the piece, but it is not a true representation of the tempi as they unfold in time. The graph does not show

the actual time-duration of each line. Each staff is represented by the same unit, where it is obvious that a very slow line takes longer to perform.

-The density graph only represents the overall density of each staff. Naturally, the number of notes cannot represent the horizontal and vertical rhythmic complexity/polyrhythms of each staff .

-The graph of dynamic range maps the dynamic markings present in each staff. It cannot and does not represent the dynamic landscape of the piece.

As we can see from these graphs - and also from the previously presented tempo-scheme -, development happens in all parameters in the piece.

What is interesting about this piece - and occurs very often in contemporary music - is, that peaks and culminations in the music are not achieved in the same fashion as in classical music. In classical music - due to the characteristics of the musical language - the dimensions/parameters work together, support each other in the realization of the work's structure/architecture.

As heard in the Fauré *Nocturne* presented in the beginning of my paper, after the initial presentation of the melody and its accompaniment, the parameter of distance/range was augmented by widening the leaps of the melody and of the accompaniment passages. This was further developed in the *E♭* minor middle section, where not only the parameter of range, but all parameters - range, density and volume - were augmented/came together in the realization of the climax.

As we can see from the graphs of range/volume/tempo and density, in *Voicelessness* the parameters do not present such synchronization. Changes/peaks in the structure's overall shape are achieved by the change of one or more

parameters at a time, maybe two, and rarely three that work together. Judging by the graphs, it seems that the parameters of density and tempo, and on the other hand volume and range work together in the shaping the piece.

Density and tempo both show a gradual development until Staff 3 (3 and 4 in tempo), after which they drop back. Another peak is reached at Staff 8 (8 and 9 in tempo). After a period when both parameters develop independently, they reach together the highest peak at Staff 14, after which they both drop down to the lowest point in the entire piece.

Investigating the development of the other two parameters - range and volume - we see, that at the beginning the parameter of range develops entirely independently, while volume stays constant. A sudden augmentation begins at/after Staff 8, which peaks at Staffs 10 and 11. A drop in both parameters' development happens suddenly at Staff 12, after which it picks up again to realize another peak at Staffs 16 and 17.

Comparing the development of the two groups of parameters - density and tempo on one hand, range and volume on the other - we can draw the conclusion, that besides two places, where the range and volume slightly support the density and tempo at Staffs 3, 8 and 14, their high-points never coincide; what more: starting from Staff 10 they almost seem to be working in counterpoint.

Further I will discuss sections that are of interest regarding the development of these parameters throughout the piece:

- Staff 1: beginning of the piece. Closely iterated, wavering thirds presented earlier.

- Staff 3 represents a minor peak at the beginning of the piece, not only in tempo, but

also in density. It is the densest line on the first page if we consider the cluster of notes it is built on (D, E, F#, G and C#, G#, A), the overall rate of occurrence of the superposed polyrhythms and the number of grace notes occurring.

-Staff 8 is clearly the fastest segment of the piece, and also the densest. It iterates an 8-note cluster, and - since its lower constituting line gradually becomes polyrhythmic in itself - we technically hear the superposition of the polyrhythms of three superposed lines. There are also a number of grace notes that are to be fit in between the actual note values, which make Staff 8 even busier. Together with Staff 9 - which marks the beginning of the breaking-down section - it represents the climax of the piece.

-Staff 10 is where the climax of the piece occurs in volume and range. While this happens, the density of the writing and the tempo drops.

-Staff 11 also represents a culmination in the piece: besides the end, it is the slowest section of the piece. We hear the steady pulse of eight notes at the combined tempo of 43/36. Judging only by the tempo-indications, actually Staff 12 would be the slowest in the entire piece at 36/40. But, since in Staff 12 instead of an eight-note beat we get the pulse of triplets at the speed of 36; therefore, what we hear is the pulse of eight-note=60, the speed represented in the graph. -Staffs 11 and 12 mark the beginning of a new section, that is based on a the feeling of a steady pulse interspersed with elements of the previous section.

-Staff 14: climax of the tempo parameter, due to the triplet eight-note pulse occurring at 72 in the second line. It is also supported by all other parameters.

-Staff 17: the end of the piece. Marks the slowest tempo in the entire piece. At this

point, every trace of a pulse is gone, the parameter of density is also at its lowest. Conversely, range is at its highest point, volume at near-highest.

From observing the graph and the interaction of the four parameters discussed above, it seems that by removing one or more parameter when another peaks, Furrer preserves the mysterious character of the piece. It becomes "voiceless," lacking something in a way, somehow anxious/void/almost tilting to negative/dark.

Learning and performing *Voicelessness* presents a few challenges that result from the unique compositional method Furrer uses to realize the work's material and structure. These challenges are: 1) keeping two tempi going at the same time; 2) realizing the metric modulations accurately; 3) the physical/mental challenge of playing the piece.

1.) Keeping two levels/time panels alive at the same time, and realizing the metric modulation accurately.

Furrer's multi-layered compositional approach is somewhat similar to polyphonic writing we encounter in the compositions of J. S. Bach. Performing both requires a multi-layered mental processing. What represents a complexity in a Bach fugue, that is not present in the Furrer, is that the performer has to keep track of the subjects, counter-subjects, their shapes and development throughout the piece, and shape them. In Furrer's piece the rhythmic and melodic formulas do not develop. On the other hand, the complexity of the Furrer piece lies in its rhythmic construction and ambiguity, where in the Bach we get clear beats and subdivisions.

Keeping track of two lines unfolding at different tempi is a skill often required

of contemporary musicians. It is not an overly difficult task in itself; however, once subdivisions occur in each line, it poses a new level of difficulty, that might be challenging for most musicians, including myself. Of course, there are always musicians that have a special ability in performing this task, or others - such as Bob Milne, the ragtime pianist - who possess the supernatural ability of being able to simultaneously listen to four different recordings in his mind¹⁰. Musicians as myself, not being in the possession of such an ability, or maybe not having developed it enough, have to resort to finding solutions to resolve this challenge.

In order to realize the the different tempi of the piece the most accurately, at the beginning of each line I have written out the tempo at which it is supposed to be performed. When I practice and perform the piece, I try to focus on the tempo of one of the two lines. Since it is the first of each pair that brings a new tempo, I keep the internal pulse of the eighth-notes in that line going, while also attempting to feel the pulse of the second line on a different - secondary - plane. Besides this "fitting in" performing approach (before, on, after), I also practice each line separately with the metronome, to form a mental image of their metric subdivisions, then I alternate between playing them separately and superposing them, in an attempt to get a feel for the way their ratios exactly overlap (the same approach I was taught to use when practicing simple 3 over 2 ratios - triplets - in my formative years).

2) realizing the metric modulations accurately:

With the occurrence of each new staff I observe the new tempo, which in most cases consists of only a slight gradation in the previous line's tempo. In order to

¹⁰ *Radiolab Podcast Articles*, "A 4-Track Mind." <http://www.radiolab.org/blogs/radiolab-blog/2011/jul/26/4-track-mind/>

realize this gradation successfully, I believe that it is very important to create a sort of "tempo-imprint," a memory of each line's tempo in the piece. While it might be difficult to realize the slight difference between the tempo of eight note=40 and that of eight-note=43, via the lot of practice of very exact tempi and checking with the metronome, the contemporary musician can form a fairly accurate imprint of what such a slight tempo-shift feels like. It is a skill that can be refined by first getting a sense of the most usual tempi encountered in the music that we play - such as 40, 46, 60, 72, etc - and gradually become more sensitive to very minute tempo changes. (In other words: we form a memory of what certain pulses feel like. On some days I am quite accurate.)

3) The physical/mental challenge of playing the piece.

The most difficult sections of the piece are the ones where the augmentation of density and range coincide, such as in Staves 8 and 14. The rhythmic complexity and the added challenge of playing notes across a wide range makes these sections difficult to process mentally and execute.

-Staff 8:

In this staff the two hands are playing a highly detailed three-layered polyrhythmic structure. The clusters played by both hands are spread out over the distance of a 9th and a 10th respectively - which added to the fact that a good portion of the two clusters overlap -, makes this segment particularly difficult to realize. Learning and practicing this section requires a divided attention between the two lines. One can slowly work on the details of each line and their combinations at any speed comfortable. However, when it comes to perform it, relying on the

strategies described earlier in my paper as the projecting of the mental model/feedback from the instrument and adjusting the execution does not work here due to the complexity of this passage and quick rate of change. By the time the performer projects/executes the material presented in one line, he might already miss playing something in the other line.

The solution to this problem lays exactly in the aspect of its physical difficulty. After practicing its details and knowing the way all details overlap, the performer has to practice "getting through" this section. More exactly: the performer has to create an imprint of the physical sensation that represents playing this piece. Since it cannot be verified and modified during the time it takes to perform, one just has to "take the plunge" and to commit to executing this section to the best of one's abilities. And that requires relying on the physical sensation of it. In a way it is like having to go through a passage that one cannot comfortably fit through: one knows that he/she will have to brush up against some rough surfaces to get to the other side.

-Staff 14: here we have to play again the combination of two pulses that happen at different rates (43/72), plus the material of the third line that spreads out over a wide range. Furrer brings the difficulty of this passage to another level by doubling each pulsing line at the octave and adding dynamic changes to them, which all happen at a different place and rate. The task here is to focus on the two + added lines, to realize them without a perceptible rhythmic or dynamic glitch, while fitting in the notes of the third line.

Judging from the material presented above, we can draw the conclusion that the mental/physical challenges inherent in the piece might become obstacles for

some performers in the creation and realization of a perfect 4+D model; at least in the sense I presented it in classical music. Due to the impossibility in creating a perfect 4+D model, there will be some tension between the mental and the physical aspects of the performance. I believe that in performance, while faced with the challenge of resolving this tension, one can try to overcome one's limitations, kick into high gear/survival mode. I believe that this might cause yet another sensation of space - mental space this time - and excitement in the performer. It is unclear whether creating this tension was the composer's intention or not, but I believe that it adds a degree of focus/intention to the piece, maybe even another dimension, that might be missing if it were a piece that was easy to execute.

Interestingly, the tension between the physical and mental challenges of the piece also adds a certain degree of intensity to the performance, a dualism, which posits the beauty/serenity inherent in the music against the difficulties of process of creating them. In spite of this, when I think of *Voicelessness*, its primary quality that comes to my mind is its unique sound-world and spatial character. The piece creates a sound-world of its own, one where the layers of sonority seem to simply exist, without progressing/going anywhere. Performing, as well as listening to it produces in us an almost timeless, dizzying, hallucinatory sensation, that resembles somewhat the listening of LaMonte Young's *The Well-Tempered Piano*. However, behind this timeless aural experience lays a lot of mental/technical work, and challenges that have to be overcome.

I believe that *Voicelessness* poses a special challenge to the performer: that of having to focus on the sound-creation in the piece, while also achieving accuracy

in realizing its rhythmic structure as faithfully as possible. The work's rhythmic complexity and technical aspect are present at every moment in the piece. However, one has to realize, that this complexity only serves the purpose of providing an architectural structure, a framework for the realization of a one-of-a-kind listening experience. If during performance the pianist focuses on realizing the sound-world of the piece, the tension inherent in the piece will serve to support and shape this experience.

On a personal note: I have found it difficult when performing this piece to resist the temptation of doing too much, to let the music simply unfold. Given the floating, weightless character of the piece which is in strong antithesis with the work's rhythmic complexity, I find myself occasionally tempted to exaggerate certain aspects of it. I have a tendency to try to "shape" the experience more than needed, add a slight crescendo to the most difficult and agglomerated sections, or exaggerate the accented notes in the piece. Having gained a new perspective on the work by re-evaluating its every element for the purpose of writing this paper, I have decided to try a new approach in my future performances: that of letting the piece happen, without interfering. I believe, that it takes a great degree of self-awareness and discipline to perform this piece without falling in the trap of its technical or musical complexity.

5.2 *Serynade* by Helmut Lachenmann

Realizing a multi-dimensional mental model in the performance of contemporary music can be much more difficult than in the performance of traditional music. Performing Lachenmann's *Serynade* is a good example of such a challenge. *Serynade* is a unique piece in many respects. Its challenges and language place performing, experiencing, and learning in a new perspective, and seeks to challenge and perhaps change our preconceived ideas about these facets of musical experience.

The unique character of the piece lies in its compositional language. Lachenmann developed his own compositional language in order to create a new listening experience. He believed, that - in spite of finding new ways of organization - modern and contemporary composers have not managed to avoid the pitfall of history. More exactly: while the means with which they organized their compositions were new, they kept the language of music intact, which was heavy with meaning acquired through hundreds of years of musical history - therefore, they could not create something new without avoiding associations with history.

What provided him with a solution to his quest to find new ways of listening was the electronic music produced by Pierre Schaeffer and his *Groupe de Recherche de Musique Concrète*. This group – through recording media - was furthering the ideas introduced to music by John Cage: the introduction of noise, silence and non-musical elements to the musical discourse. For the realization of their electronic pieces the *GRMC* used recorded sounds of everyday life and noises of the urban and industrial environment. Because of their music's strong connections to these

unconventionally produced, real-world sounds, it acquired the name of *musique concrète*. In *musique concrète* sounds got separated from their source, causing a rift between the sonorous instrument and sound, between the cause and effect. When replayed in their pure state, these recorded sounds carried the characteristics of the media that has produced them; the listener's mind could complete the picture of the source object or instrument. Composers of the *musique concrète*, through various manipulations of the recorded sounds, were able to eliminate this source-sound association that could arise during the listening process. This step in the evolution of the electronic media became a source of inspiration for Lachenmann.¹¹

In *musique concrète*. Lachenmann recognized the possibility for new directions in composition. The possibility of creating taking apart the resonance of a sound and its creating circumstances meant for him the ability to create sounds that can have their own identity, without bearing the connotations of the past. Instead of borrowing sounds from the outside world, for many years Lachenmann experimented with creating an acoustical version of *musique concrète*, exploring the noise-creation potential of instruments. He created a new language, where the sounds were not defined by intervals, harmony and rhythm, but by their means of creation. To point of this music's close connection to Pierre Schaeffer and the *GRMC*, he called it *musique concrète instrumentale*.

Taking apart the resonance of a sound and the circumstances that helped create it is a characteristic of musical deconstructivism. While deconstructivism has

11 Chris Mercer, "Music Concrète Revisited," *New Music and Aesthetics in the 21st Century*, ed. by Claus-Steffen Mahnkopf, Frank Cox, and Wolfram Schurig, Vol.2: *Musical Morphology*, (Hofheim: Wolke Verlag, 2004), pp. 162-176.

always been an inherent part of the compositional, interpretative and the listening process, deconstruction as a purposeful compositional method appeared first in the music of Lachenmann, Beat Furrer, Klaus K. Hubler and Klaus-Steffen Mahnkopf. In their compositions these composers deconstruct the essence of music-making. 1) On the small level they deconstruct: a) the sound itself to its elements of timbre, duration; b) the approach to one's instrument by making the performer play not on the part of the instrument that he's is used to play; c) the process of sound production itself by taking apart the two essential elements of sound production which during the history of music were always closely related: the event of attack and the resonance that follows it. This particular aspect of deconstruction is found in *musique concrète instrumentale*. 2) On the large level these composers attempt to deconstruct the classical elements of musical construction: the overall arch-form, classically built motifs and phrases.

Some of these composers utilize in their work simultaneously the concept of deconstructivism and that of constructivism. The two characteristics sometimes can be difficult to delineate, since they use deconstructive elements to build larger groups of sound and the overall form of the piece. In Lachenmann's music again these two aspects combine. His vision of deconstructivism is best described by the following statement:

...the negative - the destructured, music-absent musical state - evokes the Nothingness, the void, the silence, that, where the speech is silent. Still, this state is a happy, beautiful one. If one breaks or destroys something, that is only to better see that which is concealed in ourselves, to free it, or even to free us from it. The field of ruins becomes a field of power. I like to say - in a somewhat provocative way - that my music is *serene*.¹²

12 Ibid., p. 207.

Composed between 1997 and 1998, Lachenmann's *Serynade* constitutes a milestone of piano-writing in the music of the last half of the 20th century. In this piece Lachenmann's deconstructivist ideas presented in the short piano piece *Ein Kinderspiel*, developed in the piano concerto *Ausklang* and the chamber work *Allegro Sostenuto*, here become crystallized, making up a half hour long work. In *Serynade* deconstruction is present on many levels. On the primary level Lachenmann deconstructs the act of piano-playing itself. The piano becomes a new instrument, which produces sounds that we have never heard before. In order to achieve that, the performer's approach to his instrument is deconstructed. In *Serynade* the pianist is playing on the keys of the instrument and on the pedals as well.

On the level of sound production, Lachenmann takes apart the two elements of traditional piano playing that have always belonged together: attack and resonance. In *Serynade* the act of depressing the piano keys does not always produce immediate sound. On occasion, the act of piano playing is inversed, when the performer instead of striking the keys, releases already depressed notes in a rhythmical pattern, reducing the sounding notes one-by-one. This motion creates an interesting auditory effect, which can be compared to the "negative" of a melody. The gradual release of the already depressed keys gives way to the resonance of the remaining sounding notes. The resonances thus created are perceived as a melody. The only difference is that this melody results from the opposite of the regular piano-playing activity. Visually some listeners interpret this phenomenon as "playing the piano backwards".

The deconstruction of the act of piano playing has an effect on the overall creation of timbres and resonances in the piece. Lachenmann achieves new sounds and effects by exploring the resonant and damping capabilities of the modern concert piano. Inherent in the sound of the piano is its tone's immediate decay. Lachenmann chooses to manipulate this through several techniques. Most notable among these is his clever use of the piano's damper and sostenuto pedals in combination with silently depressed keys. Through this, the "normal" sounds of the piano are colored, shaded, and made fluid in different ways. The most important techniques he uses to manipulate the sound are the following:

- 1.) Certain notes or groups of notes are being silently held down with the help of the sostenuto pedal before producing another sound. This results in the over-ringing sounds of the already depressed notes.

- 2.) The exact opposite can be heard when, after a loud cluster, a group of notes is to be held over on the keyboard, which filters out the sound of the cluster. Occasionally, this also happens as a gradual, step-by-step filtering by removing of component notes to reduce their resonance.

- 3.) Lachenmann's third method of sound manipulation happens when the resonance of a chord/cluster played in *ff* or *fff* is shaped and reduced by the rhythmical quivering of the damper pedal.

While listening to *Serynade* one discovers a different sound world of the piano and the manifold possibilities this instrument has to offer. Due to its sounds and the treatment of the musical material, at the first hearing it is difficult to fully grasp the overall shape of the work. The bits and pieces of musical information,

sound materials that appear at unexpected times can be disorienting. The various sonorities and textures don't seem to relate to each other, they do not follow the logic that our previous listening experiences invested us with. Berio's *Sequenza IV* for piano composed in 1966 is probably the piece that most closely approaches the sound effects we experience today in *Serynade*. In *Sequenza IV*, the piano sounds are similarly prolonged via the sostenuto pedal, but the piece does not exploit such a wide range of possibilities as does *Serynade*.

In *Serynade* we are invited to experience listening as the existential act that Lachenmann defines it. According to him, to listen "means to discover one's own ability to change and to oppose it against the just recognized non-freedom as a resistance; to listen means to rediscover oneself, means to change oneself [...] It is a new, changed perception." Lachenmann presents this listening experience as an existential process, where the listener not only confronts the piece, but also encounters a confrontation with himself. Once we become aware of our predetermination, the question of *what* we listen to becomes subordinate to that of *how* we listen. The listening experience becomes a journey of self-observation and self-discovery. In this process, the piece becomes a "landscape, through which we are to touch our way in the process of listening. In it we recognize our own predetermined structure of perception as sublimated, as broken-up and as possible, too; maybe only in this regained freedom can we be reconciled with it (our predetermined structure) without yielding to it anew."¹³

According to Lachenmann, listening, as well as composing and performing,

13 Helmut Lachenmann, "Vier Grundbestimmungen des Musikhörens (1979)". *Musik als Existentielle Erfahrung. Schriften 1966-1995* (Wiesbaden: Breitkopf & Härtel. 1996).

are the processes of “touching the way through” the musical material, discovering the structures and relations existent in it and making sense of them, building a world out of them. Lachenmann uses the word “Abtasten” (“touching the way through”), which speaks of both the cognitive and physical aspects of the process. The connotation of corporeality found in the word “Abtasten” is a very important element of Lachenmann’s aesthetics and is also recurrent in his essays, due to its strong relations to the physical and acoustical sound-world that his pieces exploit, that of the *musique concrète instrumentale*.¹⁴ The word also describes the empirical quality of the listening experience: “feeling through” the music, experiencing it without recurring to preconceived ideas about the character of the music. It has the connotation of a blind man, who at any given moment experiences a certain object by virtue of its characteristics. With the experience of each new object, the image becomes more complete, eventually gaining a hypothetical picture of the entire landscape.

In his attempt to create a new way of listening Lachenmann created a new set of tools and elements of construction. His aim was to organize sound as form. “Form should be experienced as a unique super-dimensional sound, the structure of which we experience (Abtasten) from one sound-fragment to another, thus giving ourselves account for our purely simultaneous, increasing experience of sound-perception.”¹⁵ Instead of defining sounds by their characteristics – register, sound-

14 Mohammad, Iyad, “The Theory of Perception in the Aesthetic Conception of Helmut Lachenmann: A ‘Redefinition’ Trial of the ‘Functional’ Aspect of Music.” *Contemporary Music Review* 23, No. 3/4, (September/December 2004), pp. 91- 95.

15 Helmut Lachenmann, “Klangtypen der Neuen Musik”. *Musik als Existentielle Erfahrung. Schriften 1966-1995*, (Wiesbaden: Breitkopf & Härtel, 1996), p. 20.

color, volume and duration - he defines them using his own parameters: sound as state and sound as a process. Sound as state represents sound as a simultaneity of many parameters, whose duration is limited from the outside; whereas sound as process is an operation that imposes its own temporal boundaries. With these parameters he defines the following sound-categories:

- 1.) Kadenzklang: a sound with a characteristic envelope, regardless of its duration.
- 2.) Farbklang: is a sound with a characteristic spectrum.
- 3.) Fluktuationsklang: the repeated cycling of a small group of notes. It implies a process exerted upon the sound more or less regularly.
- 4.) Texturklang: a result of dense layering of sounds. The process is present – sounds can change in the texture – but the time element is more important.
- 5.) Strukturklang: a combination of all sound types mentioned above. In Lachenmann's concept it could represent the whole structure, the entire piece.

From the initial sketches to their final notation, Lachenmann's compositions go through a number of stages. Sometimes details get modified in rehearsals, after many years of performance. Time grids and chord blocks jotted down later meet instrumental techniques, undergo various compositional processes, thus making up the final scheme, called by Lachenmann "Strukturschema." At its turn, when all procedures indicated have been applied to it, this scheme spreads out into a half-hour long piece. For those of use that are unfamiliar with the work's design, what guides us in the interpretation of the piece is the listening experience itself. The performer, as well as the listener "touches his way through" the piece, experiencing each acoustic object in itself as it unfolds in time. Once the listener/performer

realizes the identity of these objects, their inner dialogue becomes clear and results in an interpretation of the work's design.

Hearing and performing *Serynade* brings to the listener the sense of experiencing an abstract structure of architecture created with sound, that is fragmented, angular, which simultaneously presents different levels of depth and angles of perspective. Experiencing the piece provides for a non-linear musical experience, which is very different from our listening experiences of classical music.

Listeners accustomed to hearing music composed of melody, harmony and a note-to-note development are puzzled, and at the same time fascinated by the new experience *Serynade* provides. At any moment in the piece there is a lot to take in, a lot of activity happening: the pianist prepares the action by silently depressing notes, depresses the sostenuto pedal to sustain the raised dampers; depresses the damper pedal to produce greater resonance. This preparation is followed by the actual sound producing action of playing the notes, after which the pianist executes possibly several layers of filtering of the resonances, most of the time both with the aid of the pedals and also the hands. By the complexity of actions performed, the performance becomes not only a new listening experience, but also a visual spectacle. Audiences are fascinated by the intricate hand and foot-work performed in the piece. Trying to follow the cause and effect of these actions makes the performance similar to watching an automaton: the pianist becomes a sound-making machine. At least at the beginning of the piece, the visual aspect of the performance gets in the way of the listening process and also specifically the architectural listening. In order to really "listen" to the piece, one needs to give in to the piece, give up all speculations on

how various sounds and effects are produced, and experience the piece as the sonic architecture it is, without distractions from the visual field. I will discuss the effects of the visual aspects on the perception of the architectural shape later in my paper.

With all its complexity inherent in this new type of piano-playing, *Serynade* is a composition that is challenging, but very well written for the piano. It is very well and very clearly notated, and every detail of the piece can be executed exactly the way it is indicated in the score. However, there are a few aspects of this new type of piano-playing that poses difficulties to the performer. The first two challenges of the piece are related to technical issues encountered during the learning process. The third - and greatest challenge - is that of the interpretation of its musical material and constructing the piece.

1.) The first challenge of the piece lays in its notation. Lachenmann devised a notation that represents every detail of the piece. Each different type of note - those silently depressed, the actually played notes, and those to be held over - has its own notation. Multiple staves - sometimes as many as four - are used to represent the entire range of the piano. Besides the notes, the exact duration of the filtered resonances is also notated in minute detail, with small lines followed by rests. In one place, where the performer has to dampen certain notes on the strings, on the staff above the dampened notes Lachenmann marks the group of overtones resulting from dampening action, thus precisely indicating the place of the dampening to get the desired results. The pedaling action - done via the sostenuto and damper pedals - also has its own rhythmic scheme. In spite of this amazing clarity in detail, the reading of the score proves somewhat difficult, due to the many layers of information

it contains. However, once the pianist gets used to this new notation, the score can be read just like any score of classical music.

2.) The second technical challenge in *Serynade* is brought on by the work's deconstructive approach to piano-playing, and the way this makes use of the piano's mechanism:

a.) Working with the Sostenuito pedal. Have to make sure that all the silent notes are depressed enough, otherwise the damper makes a clicking noise. Need a great amount of control.

b.) A great amount of attention is needed when playing the chords and clusters in the piece. It has to be done in a controlled manner, with a gesture that contains both the intentions of playing them and taking them off.

c.) The action of releasing already resonating notes is very important in the piece, due to the fact that it represents a counterpoint to the resonances. It needs to be performed with a great amount of control. If the release happens with an abrupt gesture, the dampers that have been lifted/sustained will fall back very quickly, in an uncontrolled manner, creating a thumping sound. This adds an unwanted noise to the resonances and it is distracting from the piece. The solution to this issue is to release the already depressed notes with a small and controlled finger-motion, that is cushioned by the wrist.

d.) Creating the sound-world of *Serynade* depends very much on the resonant capabilities of the instrument it is performed on and on the acoustics of the performance venue. It is mentioned in the performance instructions, that "a concerto grand piano with sostenuto pedal, preferably a Steinway D or C, is required." Smaller

pianos do not possess the resonance and sustaining capabilities to realize this piece. I have practiced the piece on smaller/less reverberant pianos, and I can state that the difference is notable. Lachenmann also mentions, that "the work should only be played in halls with acoustics suited to the resonances of the harmonics that occur here, i. e. in halls with short period of reverberation." Obviously, venues that have echo-y acoustics would interfere with the actual resonance of the piano. For performances in hall where it is difficult to hear the reverberations/harmonics, or with pianos that produce only weak reverberations, Lachenmann suggests remedying the situation with the use of microphones and electrical amplification of the resonances.

3.) The challenge of interpreting the musical material

The greatest challenge of *Serynade* lies in its interpretation. What is a fascinating fact about the piece, is that this challenge does not present itself at every stage of the interpretation process. More exactly the piece is so well written for the piano, and so clearly notated, that it poses no real challenge, no room for interpretation on the small scale. It is like a set of equations: execute its every detail as written to get to the sounds desired by Lachenmann. Moreover, it is inherent in Lachenmann's writing, that on the small scale the performer does not have to "interpret" the music in the traditional sense. By "interpreting" in the traditional sense I mean voicing of chords, bringing out contours of fast passages, making it "musical." Being a classically trained pianist, I have done all the above in the piece, because it was an ingrained habit, and because I enjoy "coloring" sounds, bringing out the unique timbre of each chord. However, when I have performed the piece to Lachenmann, he brought it to my attention to play the passages and chords as

indicated, as musical units, without adding to them. I believe these traditional means of interpretation would add an extra layer of meaning to music, that would remind us of our experiences in classical music, both of which Lachenmann is trying to avoid.

What seems to be challenging, however, is the following stage, where the performer has to understand and interpret the deconstructed sounds, and build larger structures from them. Making sense of the musical material can be challenging on this level, due to the deconstructed musical form, the deconstructed piano-playing techniques and the lack of linear note-to-note development of the music. Instead of building larger structures with cells and motives, the performer is presented with sound objects that are created, shaped and molded via unusual piano-playing techniques.

In *Serynade* a sound object might be any musical unit that possesses a unique material, character and dimensions. It might be a chord with a unique sound-color, a cluster of notes, several chords that form a unit, or a fast string of notes. Each sound object is differently shaped from the others, and weighted differently from all others, based on their placement in time, whether they are on the beat, offbeat. These sound objects are shaped by a process of filtering that affects their resonances. The resonance of each sound object is filtered in a very unique way, bringing out various facets of its resonances, molding its shape in time and space, thus forming multidimensional blocks/elements of an abstract construction. This filtering is realized via the sound-manipulation techniques described previously. While it is impossible to accurately describe how the filtering process affects the dimensions of the sound objects, it is important to mention the two types of filtering

processes, that work the following way:

1) Filtering by preparation: it happens when notes or groups of notes are silently depressed before a chord gets played.

2) Filtering by reduction: when the notes of an already resonating chord get filtered out by lifting the fingers and/or the pedals, or by silently depressing another chord, thus reducing its resonance.

While both types of filtering serve the same purpose, they have different effect on the resonances. Filtering by preparation (1) lifts the dampers from a certain number of strings, thus letting the notes of a played chord resonate more than it normally would, adding to its overtones. Filtering by reduction (2) reduces the sounding resonances more abruptly. By lifting the fingers and/or the pedals, the normal envelope of the resonances is reduced or cut off. This kind of reduction in the sound is indicated in the score by small crescendo hairpins placed in brackets above the notes that are being “cut off.” As Lachenmann indicates it in the performance notes: these markings “indicate desired ‘psychological’ crescendo effects [...] almost as if “ripping out” the held sound just when is it acoustically unfolding, or by filtering out of a chord hidden in or below a more compact sound through elimination of all other tones.”

When these two types of filtering are combined in the piece, their effect can change and influence - combine or replace - each other. These resonances behave somewhat like the faux shadows/continuations of the played sonorities in time and space. They are fake for the reason, that they do not sustain the actual notes depressed, but a selected group of overtones of these notes, thus creating a

shadow/body of resonance that is shifted, manipulated in its angles and proportions. There is a trace of the cause-and-effect present, however: it is distorted to a degree, that creates no logical continuity, fact that makes building up the piece more difficult. By using these filtering techniques together with a clever use of the damper pedals, Lachenmann adds dimensions to the sounds, that cannot be described: they are felt, sensed during the listening process. The meaning of *Abtasten* hereby transcends the description of experience of the musical surface: it grows into a physical experience of the piece in space and time.

To give a idea of the rich aural landscape of *Serynade* presents, I will present the shaping of the sound objects as it happens in the first section of the piece.

-Sound object 1: As we can see it in Figure 5.3 below, in measure 1 the filtering of the first chord is prepared well ahead. When first chord of the piece is played in *p*, instead of the immediate decay of the sound we hear the enhanced resonance of the chord. This body of resonance is quickly cut by the preparation for the second chord. The resonance of this second chord only last while it is being played: it quickly changes, shifting up to give space to the shadow created by the over-ringing notes of the pre-filtering chord in a higher register. I consider these two chords a single sound-object, since they seem to complement each other: the short resonance of the first chord seems to be replaced by the displaced, longer-lasting resonance of the second, creating two angled, distorted parts of one gesture.

für Yukiko

SERYNADE

Musik für Klavier

Helmut Lachenmann, 1997/98

Allegretto spirituosissimo $\text{♩} = 63$

1 2 3 4 5 6 7 8 9 10

pp *mf* *ff* *ff* *ff* *mf* *f* *mf* *ff*

Sost. Ped. *Sost. Ped.* *Sost. Ped.* *Sost. Ped.* *Sost. Ped.* *Sost. Ped.* *Sost. Ped.* *Sost. Ped.* *Sost. Ped.* *Sost. Ped.*

Edition Breitkopf 9117

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Figure 5.3: Sound objects and phrases in *Serynade*, mm. 1-13

2

14

10

11

mp

p

pp

Sost. Red.

18

12

13

p

f

ff

Sost. Red.

14

15

16

17

18

19

20

21

22

23

24

25

4 poco più largo

ff

Sost. Red.

Breitskopf EB 9117

Figure 5.4: Sound objects and phrases in *Serynade*, mm. 14-25

- Sound object 2: a chord played in *f*, that has its natural envelope and resonance reduced in stages, by almost symmetrically filtering out its component notes, to a "foreign" note the: the low E.
- Sound object 3: a pre-filtered *ff* chromatic three-octaves wide cluster, that fills up the space of the instrument. This rich resonance is suddenly reduced to a silently held cluster, that is also abruptly cut off.
- Sound object 4: is similar to the the previous one, at a lower dynamic level
- Sound object 5: a *fff* cluster, whose sonority is rhythmically filtered out reduced by the fluttering of the damper pedal. The resonance/dimensions of the chord audibly changes at every pedal fluttering.
- Sound object 6 builds again on the interaction of two chords: the sonority of the *mf* staccato chord is replaced by the following *p* chord and its filtered resonance.
- Sound object 7: the resonance of the attack is enriched by the prepared cluster in the bass. This gained body of resonance gets reduced to a higher resonance, that at its turn is filtered and cut off.
- Sound object 8: another chord that gets filtered down in several steps.
- Sound object 9: the enriched resonances of a *ff* chord that is also reduced do a cluster
- Sound object 10: a rhythmically iterated chord, whose components are symmetrically reduced to a single note, then its resonance replaced at the very end of the measure by a chromatic chord, that becomes similarly reduced, to one note.
- Sound object 11: reiterates the previous object's last sound, *Bb*, and the enriched resonance of the fluttering rhythmic formula.

- Sound object 12: a rhythmic-melodic shape that is broken up over several registers and played over a resonant and filtered cluster. The first segment of the formula opens up the sound of the piano, while the filtering process and the *pp* ending completely reduces/eliminates this spatial effect.
- Sound object 13: a resonant *p* chord filtered down in stages.
- Sound object 14: a grandiose gesture in *fff* happening over several measures, that brings out the piano's high resonances. It is reduced in two stages.

The following graph shows the multiple stages of filtering that affect the sonorities in this section. The two types of filtering - done by preparation and reduction - are marked with forward and backward pointing arrows. The graph does not, however, represent the spatial character and richness of the sonorities obtained by their sound-manipulations. (See Figure 5.5)

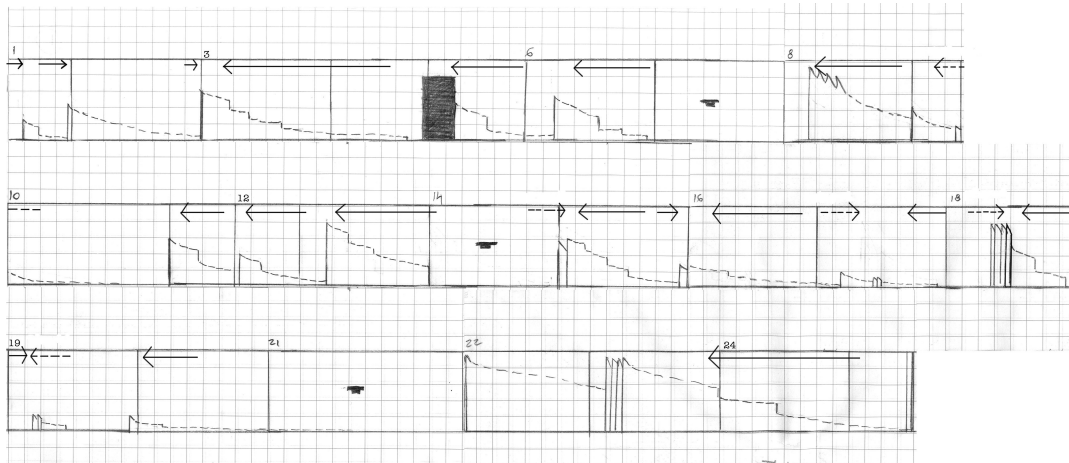


Figure 5.5: Filtering of resonances in *Serynade*, mm. 1-25

Constructing larger structures from the seemingly disjointed, linearly non-connected sounds poses a challenge to the performer. Based on the character, dimensions, placement/weight of each sound object the performer can detect various grouping tendencies/mechanisms, such as: interaction (filtering, closeness in register), opposition (counterpoint in sound quality, register, rhythmic placement), gradation/reduction in certain characteristics. By observing the qualities of the sound objects and grouping them together, the performer builds larger structures - phrases, in a way - that eventually build up the entire musical architecture. However, these grouping mechanisms are not always clear; in many situations the levels of interaction between the objects, or the lack of it might become difficult to interpret. In spite of this, the performer has to arrive at an understanding of how these objects work together and construct the piece - therefore the listening experience - accordingly. In spite of being a composition based on the idea of deconstructivism, the structure relies on constructing large-scale units out of the deconstructed elements. This means that the piece can be interpreted in terms of understanding of the classical form: phrases, that emulate the antecedent and precedent phrases of classical music, clear openings and endings, sections that refer to each other mirroring the behavior of the classical exposition and recapitulation, and even coda.

When working on *Serynade* with the composer, Lachenmann strongly emphasizes the importance of building momentum into the piece, creating connections between the displaced/disjointed units. He asks the performer to tie elements together by showing the intent of connecting them, by physically/gesturally displaying the tension inherent in the preparation of the next step, of building a larger

structure. In other words: in a way the visual aspect of the performance has to make up for the challenges inherent in the writing, the two ending up complementing, completing each other. Although, when working with Lachenmann on *Serynade* he emphasizes the importance of connecting physical gestures in the realization of the larger units, he also states that his music does not have a theatrical character. In spite of this statement, I believe that a certain degree of theatricality is inherent to the performance and perception of *Serynade*. While this is clearly not Lachenmann's intention, this element of theatricality is brought on by the deconstructive language of his music, and it manifests in the piece on three levels. First, we find it on the level of sound production, where the physical/visual aspects of the performance are so closely connected to the experience of sound, that it possibly deters attention away from the sonic experience. Secondary, the sounds of the piece - as a result of their connection to *musique concrète* - have a strong physical/visual character. Without actually making references to any non-musical methods of sound production, their unique character and their shaping in time and space make them like abstract objects that we can almost feel and sense. This enriched experience of the music is described by the word "Abtasten" in Lachenmann's writing. Finally, the third aspect of visual manifestation in *Serynade* involves the visual quality of performing the piece, namely the connecting gestures necessary in order to build larger structures in the piece. I believe, that once gestures gain a primary importance in the performance of a musical work, it becomes a visual/theatrical experience. There is no other composition in the entire piano literature whose structural perception depends on the gestures executed by its performer, other than those absolutely necessary to

rendering the work audible. By this added dimension/characteristic, witnessing *Serynade* becomes a visual/theatrical experience.

Further in my paper I will discuss how larger structures in *Serynade* can be realized, by presenting how I build up the very first section of the piece.

As seen already from the description of sound objects, certain grouping tendencies can already be found on the very small level. That's how - based on the behavior of the two first clusters - the first actual sound object is made up of two elements: the second cluster is in such close proximity to the first in both time and range, that its resonance ends up replacing that of the first. A similar tendency can be noticed in measures 10-11. However, these two clusters are more displaced in time and therefore are perceived as two separate sound objects. As we can see, these groupings are based on my listening experience and interpretation.

In the first phrase, there is a gradual build-up in both resonance and dynamics to the third sound object - the *ff* cluster in measure 4, and a slight decrease in intensity in sound object 4. Object 5 is a further removed/displaced high-point of the phrase, followed by Object 6, which sound similar to a cadence-like ending.

The next phrase begins with a gesture similar to the interaction of the two chords in Object 1. Sound objects 7-8 have to be gesturally connected in order to lead to Object 9 in an overall crescendo.

In the next short phrase Objects 10 and 11 are practically connected by the resonance of a common element, the A# that is re-iterated as Bb. This phrase displays a slight decrescendo and downward movement, opposing the previous phrase.

Object 12, punctuated by Object 13 present a sharp peak in dynamics, and a downward motion across many registers. This phrase, as well as the previous one, somewhat balance out the upward direction of 7-8-9.

Object 14 is in sharp contrast with all other sounds heard in this section. I consider it a conclusion, a coda to this section. What also points to this is the tempo indication marked above it: "poco più largo."

As we can see, at this level of construction, building blocks of the piece are neither alike, nor symmetrical. The performer needs to interpret their tendencies of relating/opposing to each other, and create larger structures from them. In my view of this section, the piece opens with one larger, disjointed phrase, which is followed by three short phrases that balance each other out. The section ends with a short, contrasting conclusion/coda.

There are sections in the piece that do not pose a challenge in interpretation. These are the sections where: a) the constructive process is more prominent/explicit, and b) sections where the construction process is entirely missing.

a) An example of a section that basically constructs itself is found between measures 38-47. Here the sound objects are more linear, surface-like passages, with a clear direction, posing no issues regarding interpretation. (See Figure 5.6)

The image displays a handwritten musical score for a piece titled "Serynade", specifically measures 38 through 47. The score is organized into five systems, each consisting of a grand staff with a treble and bass clef. The notation is handwritten and includes various musical symbols such as notes, rests, and dynamic markings like "f" (forte) and "ff" (fortissimo). The piece is in 3/4 time. The notation is handwritten and includes some corrections and annotations. The score is written on five systems of grand staves (treble and bass clef). It includes various musical notations such as notes, rests, and dynamic markings like "f" (forte) and "ff" (fortissimo). The piece is in 3/4 time. The notation is handwritten and includes some corrections and annotations.

Figure 5.6: *Serynade*, mm. 38-47

b) There are two sections that present no obvious construction process happening.

The first one is a section built on a cluster that is filtered and shaped in many ways. It creates the impression of a wide open field scattered with huge abstractly-shaped blocks, that at first all seem to be identical. As we experience each block on its own, we discover minute differences between them. In this section time slows down, and - just as we did in the Aria from the *Goldberg Variations* in Glenn Gould's recording - we focus on the minute details happening in the sound. (See Figure 5.7)

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Figure 5.7: *Serynade*, mm. 145-172

Another example of a section in *Serynade* that lacks constructive process is the pedal solo. At a certain point in the piece the damper pedal is elevated to a completely autonomous role when all other types of piano-playing cease and all that is left is the thumps created by the accented release of the damper pedal, resulting a beautiful ringing, airy sound of the piano mechanism resonating within itself. It is an almost breathing-like sound. After having experienced the loud peaks of the sonic landscapes this sound projects us into the abyss. As Lachenmann presented it: it is desolate, but at the same time it is beautiful. His indication to performing this section is not to take the rhythmic notation of the pedal too literally; instead to adjust the rhythms to the resonance of the piano to create the desired airy effect. (See Figure 5.8)



Figure 5.8: *Serynade*, mm. 228-241

Given the deconstructive character and the new musical language of *Serynade*, it might seem like a difficult task to realize a mental representation of its overall structure. However, by experiencing and living the piece, by understanding and building it up from the very small level, it becomes as familiar a landscape as that of the Liszt *Sonata*. Once the performer becomes versed in Lachenmann's musical language and methods of shaping sounds in time and space, the tendencies of construction of larger structures becomes more clear. The performer then works toward realizing a cohesive, architectural musical experience out of the abstract, seemingly broken pieces of information that Lachenmann presents.

However, this experience may not be the same for the listener. As discussed before, the strong visual aspects inherent to the language of the piece, and necessary to the performance of the piece may not be conducive to the realization of a sonic architectural experience. Audiences witnessing *Serynade* might become distracted by the visual aspects of the experience on some level - most likely on the level of sound production - and may not be able to grasp the full architectural shape of the work. A solution to this problem is to also experience *Serynade* on a sound recording, where the listener can simply be immersed by the sounds of *Serynade*, and create a more full sonic multidimensional mental representation without encountering any distractions from the visual realm. In my approach to *Serynade* I attempt to create this type of sonic architectural mental model without paying too much attention to the visual aspect of the performance from an audience's perspective. Audience members that are familiar with Lachenmann will be able to hear past the physical side of the performance, or at least view it without distracting

from the complex sonic architecture of the piece and its interpretation.

My suggestion would be highly unusual in the case of any other piano piece. But, I believe that *Serynade* is unlike most other piano pieces. Lachenmann created the language of *Serynade* - *musique concrète instrumentale* - after he recognized a possibility in *musique concrète* to break with history, and write music based on sounds that carry no historical meaning. However, by writing a composition of *musique concrète instrumentale*, the piece gains such strong visual connotations during performance, that in a way it gains new meaning, it becomes a theatrical performance. It loses its idea of being a purely listening experience. The very element that distracts the listener from forming an architectural representation of *Serynade* is itself the human element of performance.

6. CONCLUSION

As conclusion to my investigation into the importance of realizing a multidimensional mental model of musical works we intend to perform, I would state, that creating a model of contemporary music works similarly to the traditional approach. In both types of music the learning process involves getting to know every detail of the work and build up an architectural musical structure by realizing the relationships between its elements. However, realizing the 4+D image of classical compositions relies on certain conventions/traditions/performance practice that has been established along centuries. While naturally, the process of realizing a 4+D model of a certain classical piece slightly differs from another classical piece, we have these conventions that we can rely on, that can guide us, give us an insight into the future of how that structure will be generally realized.

When learning a contemporary composition, we cannot rely on such conventions. As presented in the case of *Voicelessness* and *Serynade*- there is no structural, harmonic frame that we can fall back on. The tools that we gained in the learning of traditional music will help us in the process, but will not be enough. Given the difference in the language and compositional technique of contemporary music, the interpretation of each new piece we will need a new, independent approach, and the challenges of each piece has to be addressed separately. In certain cases - such as the Lachenmann- we will have to learn a different musical language.

While - as happens in classical versus contemporary architecture - the principles of constructing the final architectural shape will be more or less the same (fitting together pieces of the final model) - the building elements and the overall final shape will be different. Unlike in the case of a classical composition,

where all elements work together to realize the final grandiose shape of the structure, in contemporary music the constructing elements of the piece might seem disjoint, set against each other in their immediate relationship. The balance of the musical structure is realized by the relationship of tension and cohesion existent between its elements, that works on multiple levels. Given the complexity of this structure, I would state that the 4+D mental representation of a contemporary work presents more dimensions than the mental model of a classical piece.

Given this high degree of complexity and the interaction of its constructive elements, a contemporary piece might also pose a greater degree of challenge than classical pieces. These challenges will be the same that all piano pieces pose: physical, aural, mental. However, I would state, that - since contemporary music uses material in a non-cohesive/coordinate way to realize the musical architecture - the challenges that we encounter in these pieces are the same challenges we encounter in classical music, but augmented to a whole new level. As in a certain section of *Voicelessness*, the challenges augment to the level of impossibility. In spite of these challenges, the performer will need a great degree of flexibility and thriftiness to address and solve these challenges. As it is in the nature of the art that we practice, we will always have to keep aiming towards further developing our skills of learning and interpretation, and towards the realization of more perfect representational models.

Just as the learning and performance of classical music provides us with tools to solve the challenges of contemporary music, we can adopt some of our knowledge gained from the learning and performance of contemporary music to our

approach to traditional repertoire. To avoid the clichés and pitfalls encountered in the realm of the classical repertoire, we should approach every piece we learn as a clean canvas, and realize our mental representation based on our individual judgments of the music.

I would also encourage this approach in teaching- in my own, as well as in that of others. While I admit, that there is a fine line between original and arbitrary performances, I would like to hear more performances where the pianist has a unique take on the piece, that is so strong that - in spite of not agreeing with it - it holds its own and creates a convincing architectural musical experience.

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