Portfolio of Original Compositions

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Abstract

Exploring musical structure through three-dimensional visualisation

The main purpose of this PhD has been:

- to explore how multidimensional visualisations of musical parameters can inform a distinctive approach to composition.
- to balance pre-determined decisions with others taken intuitively and/or with the existence of extra-musical narratives within the music.

The portfolio includes six original compositions, as listed below:

Within the curves (string quartet)
Complexity (solo A clarinet)
The in-between (piano solo)
Grieving (for 10 performers)
α-mazed (graphic animated piece for santoor and flute)
Synesthesia (violin, saxophone, trumpet, visual artist)

In this work an architectonic software (SketchUp) was used to create three-dimensional visualisations, which served as a guide to control the interaction of musical parameters to create musical structure. *Within the curves* and *Complexity* are abstract pieces that use this approach as a primary focus of the piece. *Synesthesia* and *α-mazed* built on the idea of visualising musical structure in ways that prioritise performer freedoms . Regarding *The in-between* and *Grieving,* my methodology was applied for the creation of programmatic work, exploring the stages and characteristics of mental health conditions. Such characteristics play an important role in deciding the musical structure of each of the two pieces.

Declaration

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Copyright statements

Contents of Download

The pdf scores of the six pieces can be downloaded from the following address: https://drive.google.com/drive/folders/1OPjOCdzkSNXlTd9x5YwVNYqRxJrEPfsg?usp=sharing

N.B: *α-mazed* (santoor-flute) has been played from a video so there is only a pdf with instructions attached to this commentary.

Details of recordings and videos

The recordings (audio or video) can be downloaded from the following address: https://drive.google.com/drive/folders/1OzOf_ewzIqM494ZhGp2AQpj6HMl_jalB?usp=sharing

Within the curves – string quartet

> ***Positive*** (first movement) (9'39"): workshop performance by the Quatuor Danel, on December 6th 2018, Cosmo Rodewald Concert Hall, University of Manchester, United Kingdom.
>
> ***Negative*** (second movement) (estimated overall duration: 8'): bars 21-35 workshopped by the Solem Quartet, recorded January 28th 2021, online event, duration of recording: 58".

Complexity – clarinet A solo (9' 30"): recorded by Francesca Gale, on June 29th 2021, Martin Harris Centre of Music and Drama, University of Manchester, United Kingdom.

α-mazed (15'): performed by the Avazad Duo [Atefeh Einali (santoor) and Eliorah Goodman (flute)] on October 25th 2019, Cosmo Rodewald Concert Hall, University of Manchester, United Kingdom.

Synesthesia – violin, trumpet, saxophone, visual artist (8'): perfomed by the Vonnegut Collective and the visual artist Laura Orton on March 12th 2020, Cosmo Rodewald Concert Hall, University of Manchester, United Kingdom.

The in-between – piano solo (11' 30"): performed by Dr. Richard Whalley on April 3rd 2019, Anthony Burgess Foundation, Manchester, United Kingdom.

Grieving – chamber ensemble (estimated duration 20'): due to COVID-19 restrictions and social distancing rules, this piece could not be performed before submission.

Other supporting material

There are six videos of the visualised musical structures attached to this commentary, which can be downloaded from the following address:

https://drive.google.com/drive/folders/1OegXTI5R9zhPavq9bB-aW6kjNODaCkgB?usp=sharing

There are two videos for *Within the curves* – string quartet (first movement and second movement), one video for *Complexity* – solo A clarinet, one video for *The in-between* – piano solo, and two videos for *Grieving* – chamber ensemble (Part 1 and Part 2).

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Chapter 1 – Exploring musical structure through three-dimensional visualisation – Introduction

1.1. Important influences and general context as the genesis of the research aims and questions

During my Master's degree, I gradually became interested in the work by the composer Iannis Xenakis (1922-2001). The way he incorporated architectonic principles and thought in musical creation[1] inspired me to start controlling, comparing, and contrasting musical parameters through built structures and shapes drawn on paper. This approach led me compose a string quartet Étude for my Master's, which was exclusively based on a curved surface derived from a plotter and followed as an algorithm. This piece helped me shape the research questions mentioned below, and served as a guide for the first portfolio piece I composed (also a string quartet). My main divergence from Xenakis' approach is that my research does not engage with 'indeterminate stochastic phenomena'[2] or with any other applications of advanced mathematics in music.[3]

Another composer who truly represents the musical path I wanted to explore is Kaija Saariaho (1952-) and, especially, her piano solo pieces *Prelude for Piano* (2007) and *Ballade* (2005). Similar to Xenakis, Saariaho also works with '*structures of several levels*.'[4] According to Pirkko Moisala[5] '[...]Saariaho[...] draws a kind of harmonic map of the whole work and develops the other musical materials. She makes decisions about the instrumentation and she sketches different kinds of textures, sound colors, and playing techniques, as well as makes plans for the rhythmic characters of different parts and melodic gestures. Saariaho may draw sketches on graph paper in order to map the proportional durations and characteristics of different sections of the work'.[6] Saariaho is also known for being a spectral composer, for using 'compositional

1 Iannis Xenakis, *Formalized Music –Thought and Mathematics in Composition* (London: Indiana University Press, 1971)
2 Ibid. 12
3 Ibid. 131-134
4 Kaija Saariaho, *Timbre and harmony: Interpolations of timbral structures* (Contemporary Music Reviews, 2:1, 1987, 93-133), 107 (DOI:10.1080/07494468708567055) (accessed 15 December 2021)
5 Pirkko Moisala, *Kaija Saariaho Women Composers* (University of Illinois Press, 2010)
6 Ibid. 61

assistance language'[7] in her works, and for often engaging with 'electroacoustic or natural sounds'[8], areas that do not relate to the scope of this research. She inspired me to focus on the layers of texture and how they could inform musical form. Later, I will explain how she influenced me on harmony and rhythm.

Based on these, I turned to three-dimensional space at the beginning of this research, as I soon found limitations with two-dimensional paper. Working with architectonic software (SketchUp) provided even more practical possibilities which will be discussed in chapter 2. The first two research questions were:

1a) How can multidimensional visualisations of musical parameters inform a distinctive approach to composition?
1b) To what extent can the three-dimensional representations of parameters be varied, in order to facilitate an innovative approach to form?

Question 1a) is the basis and main context of this research. The answer is given through the discussion of the individual pieces, and also in the conclusion. Question 1b) is answered exclusively during chapter 5 where I discuss the non-traditionally-notated pieces (*α-mazed* for santoor and flute. *Synesthesia* for violin, trumpet, saxophone, and a visual artist).

2) How is it possible to achieve a balance between creative decisions and consistency to a pre-organised macro-structure without sacrificing either?

This question is addressed in chapter 2 regarding the research visualisation method. Further details are given in chapters 3 and 4 regarding the traditionally-notated pieces (*Within the curves* for string quartet, *Complexity* for clarinet solo, *The in-between* for piano solo, and *Grieving* for chamber ensemble).

Lastly, another important influence was Giacinto Scelsi's (1905-1988) monotonal approach and especially his piece *Quattro Pezzi* (1959). As he described in 1987:

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7 Kaija Saariaho, *Timbre and harmony: Interpolations of timbral structures* (Contemporary Music Reviews, 2:1, 1987, 93-133), 124, (DOI:10.1080/07494468708567055) (accessed 15 December 2021)
8 Pirkko Moisala, *Kaija Saariaho Women Composers* (University of Illinois Press, 2010), 63

'reiterating a note for a long time, it grows large, so large that you even hear harmony growing inside it... When you enter into a sound, the sound envelops you and you become part of the sound. Gradually, you are consumed by it and you need no other sound...All possible sounds are contained in it'.[9]The main difference with my approach is that such aesthetic only exists as part of the piece's structure and it is not the basic essence of its existence. The way I treat limited pitch material will be discussed later.

Scelsi's influence at the very beginning of the research shaped the following question:

3) How can interactions between other parameters, which will not be mapped in three dimensions, affect texture and structure?

This question is answered for each piece individually but is particularly vital in the pieces discussed further in chapters 3 and 4.

During the first year of research I worked on *The in-between*, which is based on a sleep disorder, known as *sleep paralysis*. I soon realised that I was working with an 'extra-musical' narrative that consisted of steps or stages that could be transformed into musical sections and parameters, providing a guide for structure. It was important to connect this with the three-dimensional approach I was exploring, forming the last research question:

4) How can three-dimensional visualisations as pre-compositional procedures aid the process of representing narratives as 'extra-musical' inspirations in composition? How can such pre-existing narratives balance with the composer's intuition and creativity?

This question refers to the two narrative pieces discussed in chapter 4.

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9 Giacinto Scelsi, interview (1987) with Franck Mallet, "Il suono lontano: Conversazione con Giancinto Scelsi,"trans. Marco Montaguti [French to Italian] in *Giancinto Scelsi*: *Viaggio al centro del suono,* ed. Pierre Albert Castanet and Nicola Cisternino (La Spezia, Italy: Luna Editore, 1993), 25 as cited in Gregory N. Reish, '*Una Nota Sola:* Giancinto Scelsi and the Genesis of Music on a Single Note', Journal of Musicological Research, 25:2 (2006), 150 (https://doi-org.manchester.idm.oclc.org/10.1080/01411890600613827)(accessed on the 18 May 2021)

Working on *The in-between* helped me realise that it would be useful to research the area of programmatic music regarding the aforementioned research question. The main difference with my approach is the absence of the traditional application of *leitmotifs,* an integral part of programmatic music. The way I utilise similar entities in my portfolio will be discussed later. In addition, I specifically worked with mental health conditions in order to explore and convey my own lived experiences through music. Beyond this goal, the pre-existing narrative is not the absolute musical goal but mostly a source of engaging structure.

A source of inspiration has been the work by Jocelyn Pook and her piece *Anxiety Fanfare and Variations for Voices* (2014) from her *Mental Health Trilogy*. According to her website, she 'took inspiration from conversations with people who suffer from anxiety, in all of its many forms, and was particularly interested in the experience of living with anxiety on an everyday basis'.[10]The main difference between her approach and mine is that I based my work on my own experiences as opposed to empirical research or interviews.

1.2 Musical and other aesthetic characteristics

1.2.1 Limited pitch material, static harmony, active rhythmic surface, and sectional form

In the coming paragraphs I will expand on topics relevant to the main characteristics of my music. Pitch material, harmony, rhythm, and form will be discussed separately, in order to give the reader an overall idea of how my combined influences and my own vision resulted in pieces which contribute to existing knowledge.

To begin with, the most important aspect of my music is the pre-determined material of a small number of pitches, chosen based on the horizontal intervals they form. These intervals can be both consonant and dissonant. That allows the existence of potential tonal functions within the same pre-determined pitch-group (for example, a horizontal semitone can be heard as a subtonic to tonic) or between different pitch-groups (for example, a horizontal perfect fourth can be heard as a dominant to tonic). Hinting tonal

10 Description found in Jocelyn Pook's official website (https://www.jocelynpook.com/home), (accessed 25 October 2021)

functions within my pieces is important for me, as my aesthetics have been heavily influenced by my experience in piano performance.

There are several of these pitch-groups within each piece. The groups share pitches and allow gradual and organic passing from one pitch-group to another. Some of these pitch-groups are musically more important than the others, due to their complexity and constant appearance, within a given piece. In order to categorise the pitch-groups I borrowed the term *motif* to label the more important pitch-groups. The motifs in my traditionally-notated pieces can be either built by steadily introducing their pitches (*fragments → motif*), or introduced as a whole and, then, they can appear fragmented (*motif → fragmentation*). During these constant back-and-forths between establishing and fragmenting the motifs, the music gives the impression of moving and progressing. In addition, the pitch-material is usually pushed to its extremes either regarding register, dynamics, or texture with a gradual passing from one extreme to the other. The method I followed to make appropriate decisions and coordinate all these will be discussed in chapter 2.

Such repetition of the pitch-material automatically results in harmonic stasis, despite any brief tonal functions or cadences. In my music more emphasis is given to the horizontal rather than the vertical harmonic events. Borrowing Saariaho's quote: 'to qualify the traditional conception of timbre's and harmony's respective functions, I would say that the function of timbre is considered as being vertical and that harmony as horizontal'.[11]In my aesthetics, harmonic stasis is inseparably connected to the piece's cohesion. During the discussion of the individual pieces the reader will come across more details regarding harmony, how it influenced other parameters, and whether it progresses within a given piece without losing its overall stasis.

In addition, Daniel March described Saariaho's approach over texture and rhythm as 'a slow-moving music articulated through a detailed, filigree surface'.[12]I was very influenced by the way she defines texture through the usage of fragmented tuplets and overlapping layers, and I followed a similar approach. This is more profound in my

11 Kaija Saariaho, *Timbre and harmony: Interpolations of timbral structures* (Contemporary Music Reviews, 2:1, 1987, 93-133), 94 (DOI:10.1080/07494468708567055 accessed 15 December 2021)
12 Daniel March, *From the Air to the Earth: Reading the Ashes* (edited by Tim Howell, Jon Hargreaves, Michael Rofe (Ashgate Publishing, Ltd., 2011), 29

traditionally-notated pieces. In these pieces the score's surface is rhythmically active to help my music to be constantly moving. This is also achieved by following a sectional form, where a piece develops through consecutive sections. These sections have many common characteristics as we mentioned the reoccuring pitch-material, but each one of them adds a new textural element or applies the same textural ideas in different registers. Lastly, some of these sections appear as contrasting to others or with contrasting characteristics, as will be explained later.

The repetition of restricted material shares some common ground with the area of *minimalism*. However, I do not consider myself a minimalistic composer, but rather one who embraces reductionism as a broader term. Timothy Johnson describes that: 'pieces focusing primarily on the process alone or pieces that lack goals and motion toward those goals best exemplify the delineation of minimalism as an aesthetic'[13], a statement, that does not entirely match the unsettling quality of my music.

1.2.2 Contrast, interference, and the aesthetics of failure

In the coming paragraphs I will expand on contrast, interference, and the aesthetics of failure topics. They will be separately discussed to give the reader an understanding of their application in my work.

The idea of contrast is not new in musical composition. From the contrasted subjects of the Sonata Form to the many and different approaches of contemporary composers, this idea has been thoroughly explored. Saariaho specifically said that ″[...]the construction of musical form has always used this principle of oppositions. In a composition it can be found on a small scale [...] and in the larger structure of the piece (slow section/fast section); and not only in music but in all the arts'.[14]In the understanding of my work, it is helpful to define how contrast affects the structural characteristics of my portfolio pieces and generally their macrostructure. Such characteristics are part of pre-composition. Common applications are a) contrasting registers, b) tension/release of

13 Timothy A. Johnson, *Minimalism: Aesthetic, Style or Technique?* (The Musical Quarterly Vol.78, No.4 (Winter 1994), 742-773), 744

14 Kaija Saariaho, *Timbre and harmony: Interpolations of timbral structures* (Contemporary Music Reviews, 2:1, 1987, 93-133), 97, (DOI:10.1080/07494468708567055) (accessed 15 December 2021)

tension through dynamics, textural density or speed, or c) contrasting interludes. Another important characteristic which defines my approach is the total absence of long silences, automatically excluding the application of sound versus silence as an intended use of contrast.

In my work, interference appears in the microstructure. The difference from contrast is that interference is more based on my intuition and creativity and it mostly affects the score's surface. For example in *Complexity* it appears as sudden jumps between registers, even within the same bar, while in *Grieving*, different instruments or groups of instruments interrupt each other.

The *Aesthetics of Failure* is a term that Kim Cascone[15] coined in discussion of electronic music. Cascone refers to the term glitch and gives a full analysis on this aesthetic. In my portfolio, failure can be understood mainly regarding the rhythmic surface. The acoustic result is a back-and-forth between the pitches in different rhythms, as if the score's surface 'stuck' while scrolling. It can be heard in *Complexity*, *The in-between*, and *Grieving*.

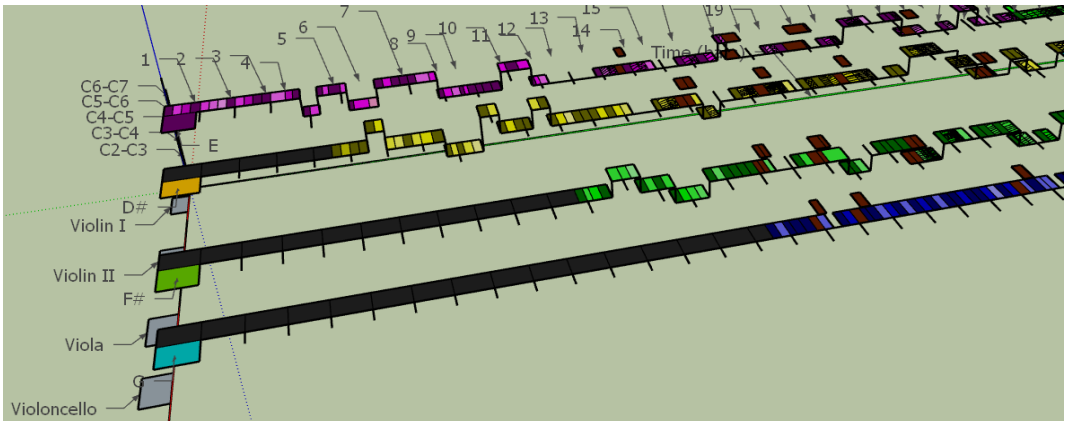
15 Kim Cascone, *The Aesthetics of Failure: "Post-Digital" Tendencies in Contemporary Computer Music* (Computer Music Journal, Vol. 24, No. 4, Winter 2000, 12-18) (http://www.jstor.org/stable/3681551) (accessed 10 March 2022)

Chapter 2 – The three-dimensional visualisations

2.1 Axes, space, dimensions, and shapes

In order to create the three-dimensional maps that could then dictate musical structure, I primarily used the software SketchUp. It allows the composer to draw an envisaged structure in three dimensions. More details and musical reasons are given at the beginning of section 2.2. Another benefit is the option to create videos from different angles. More details are given in chapter 5. SketchUp's default environment is defined by three axes (x,y, and z) and allows the user to place objects at chosen heights. Therefore, this commentary will only refer to 'space' as it stands within this limited, virtual area, rather than engaging with other practical or philosophical interpretations of the term.

Initially, I started organising the musical parameters of each piece into colourful, virtual surfaces. The x axis usually represents instrumentation, the y axis the range of the instrument's register, and the z axis time-passing. As soon as the pitch material was not part of the visualisation procedure, these surfaces could dictate register, dynamics, texture, and differentiation of sections. In the following chapters I will explain how I adapted this technique for each of the portfolio pieces in order to fully explore the method's possibilities. An example of how the visualisations work is given below.



Ex. 1 – *Within the curves* for string quartet (beginning of the first movement)

In Example 1, each of the string quartet instruments has its own rectangular colourful surface, which appears throughout the first section of the piece. The layer of violin I has purple colour to represent pitch E, and violin II, viola, and violoncello have the colours yellow, green, and blue to represent pitches D#, F#, and G, respectively. Each surface is placed on a specific height to show the register, and the darker shades of each colour represent louder dynamics. The grey colour represents rests, and the brown colour double stops.

It is also important to clarify the term 'dimension' in my work. I worked with width (x axis), length (z axis), and height (y axis). The visualisation dictating musical structure serves as a compositional tool, and always has a specific and fixed starting point, and a separate and fixed ending point. It is always built across a timeline (z axis) therefore the nature of my work is consistently linear in structure. The visualisation, representing the music, always has a fixed shape even in situations where performers have freedoms over creative decisions. My approach engages with linear procedures, surfaces, and musical structure/overall shape, therefore, I chose the term multi-faceted to describe my overall approach/method , and the term three-dimensional specifically to describe structure within my music.

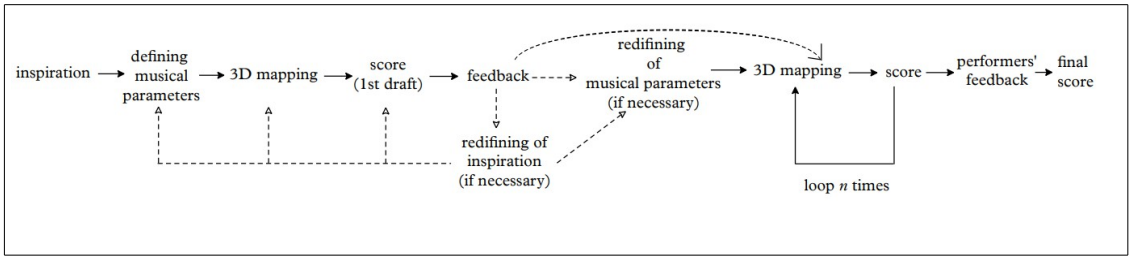
2.2 Balancing creative decisions and pre-organisation

The most important benefit of this method is that it allows the composer to instantly compare and contrast, at a glance, each musical parameter and engage with a great deal of detail. As a result, despite working with limited pitch material, it is possible to slightly, but constantly, transform it to help the musical form progress. In addition, it enables the composer to have an idea of the acoustic outcome and all its details, beginning to end, even before they compose anything, an approach that Xenakis first developed. As Sven Sterken[16] explains: 'The graphical method also had another important implication for Xenakis' compositional approach: it engendered a global conception of musical form, clearly inspired by his work as an architect. Contrary to the traditional organic composition technique, where one starts out from a cell (a theme or base row) and out of it creates the 'building' of a composition, Xenakis dealt with the

16 Sven Sterken, *Music as an Art of Space: Interactions between Music and Architecture in the Work of Iannis Xenakis* (Essays on the Intersection of Music and Architecture (Lulu.com, 2007)

overall form and the tiniest details simultaneously […]'.[17]

It is crucial to mention that my visualisations do not serve as algorithms even if there was a shared ground at the beginning. Julian Rohrhuber[18] explains that 'an algorithm is on the *verge of time*: on the one hand, it is strictly structural – a formal, unchanging entity. On the other hand, it is only a formula, but a formula that prescribes steps to be made the one after another, depending on one another. It is a formula that exists in order to unfold, in the form of a process, in time and over time, and dependent on its past inputs'.[19]In contrast, I always started by creating an initial visualisation and an initial draft of the piece. Then, I moved back and forth between the score and the visualisation, which served as feedback for every new score draft. Therefore, my shapes were changeable, not following the algorithmic definition. The final visualisation matches the final score barring small adaptions I might have made to the score, based on performer feedback. The graph in Example 2 goes some way towards describing this compositional procedure.



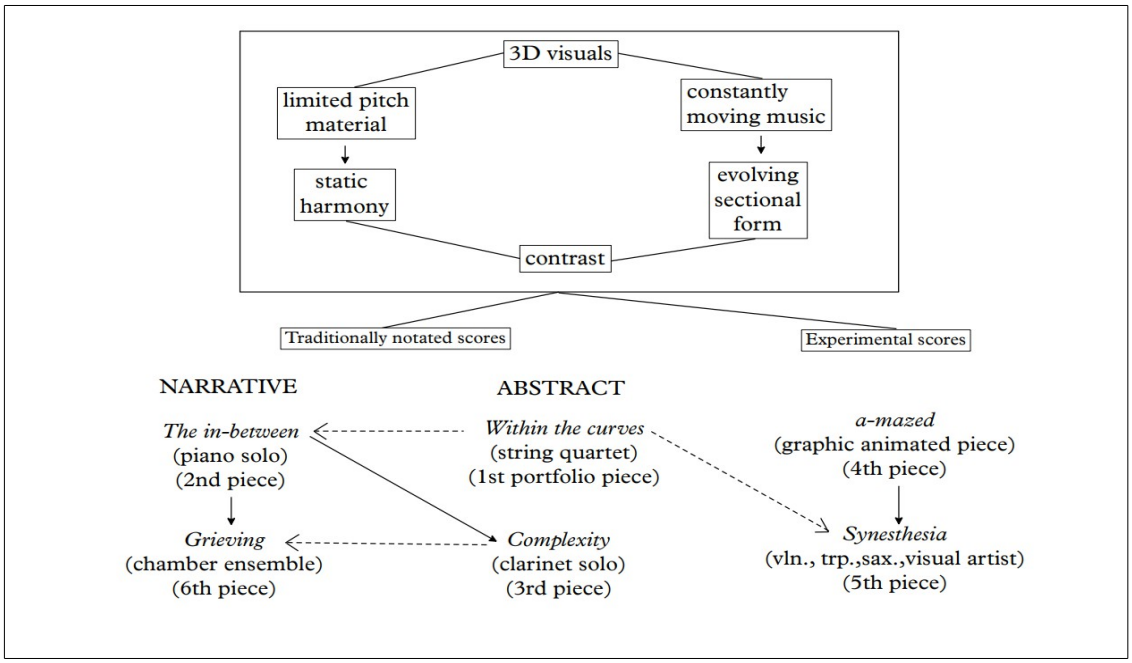
Ex. 2 – Compositional procedure

Serving my vision for each piece was the main reason I chose not to visualize everything and leave some important aspects of the acoustic outcome to my intuition or the performers' hands. Any dramatic narrative or trajectory was based on my intuition or on a basic plan I made beforehand, and the visualisations only complement this process, showing what was practically possible and efficient. This is also the main reason why my virtual shapes appear fragmented (cubes, for example, were the quickest shape to draw), as their appearance did not influence the traditionally-notated pieces' flow and musical progress. The cubes mainly existed to 'hold' musical

17 Ibid. 29
18 Julian Rohrhuber, *Algorithmic Music and the Philosophy of Time* (*The Oxford Handbook of Algorithmic Music* (Oxford University Press, 2018)
19 Ibid. 17

information. If we also take into consideration the potential existence of an extra-musical influence which would inherently influence form, then it is possible to understand that the borders between the various aspects of my work, such as intuition, aesthetics, control through visualisation, and narrative became fluid and different for each piece.

For *Within the curves* I followed the visualisations meticulously and tried to absorb any possible information the shapes could give me, while visualising and coordinating as many parameters as possible. For *Complexity* I tried to prioritise the development of texture for a monophonic instrument within the visualisation process. For *The in-between* I focused on the extra-musical narrative and mostly explored textural progression for a polyphonic instrument. For *Grieving*, due to the variety in instrumentation, I had to understand what was musically possible while finding a balance between narrative and intuition. The visualisations were a helpful tool in all these pieces, enabling me to dive into detail. Finally, for *α-mazed* and *Synesthesia* I had to leave aside my role as the absolute creator. Therefore, I exclusively focused on visualisation to explore its impact on form. Example 3 connects the portfolio pieces with my overall aesthetics and compositional goals. The pieces' connection, given in the graph with arrows (direct influence) or dashed arrows (non-direct influence), is explained over the coming chapters.



Ex. 3 – Overall research graph

Chapter 3 – Abstract, traditionally notated pieces

3.1 *Within the curves* – string quartet

3.1.1 General description

This was the first portfolio piece completed, and exhibits a wide range of influences as I was determining the paths I wanted to follow through this research. I followed some of my existing tools, such as the use of curved surfaces, as well as ideas which I later abandoned, such as showing curved shapes on the score's surface. The movements are based on contrast, with the second movement moving in an opposing musical direction to the first movement. The first movement was workshopped by The Quatuor Danel string quartet on the 6th of December 2018 at the Music Department in Manchester, which led me to expand the piece into a second movement, an abstract of which was workshopped by the Solem Quartet in an online event on the 28th of January 2021. I also workshopped the second movement with the Eskandari Quartet without recording.

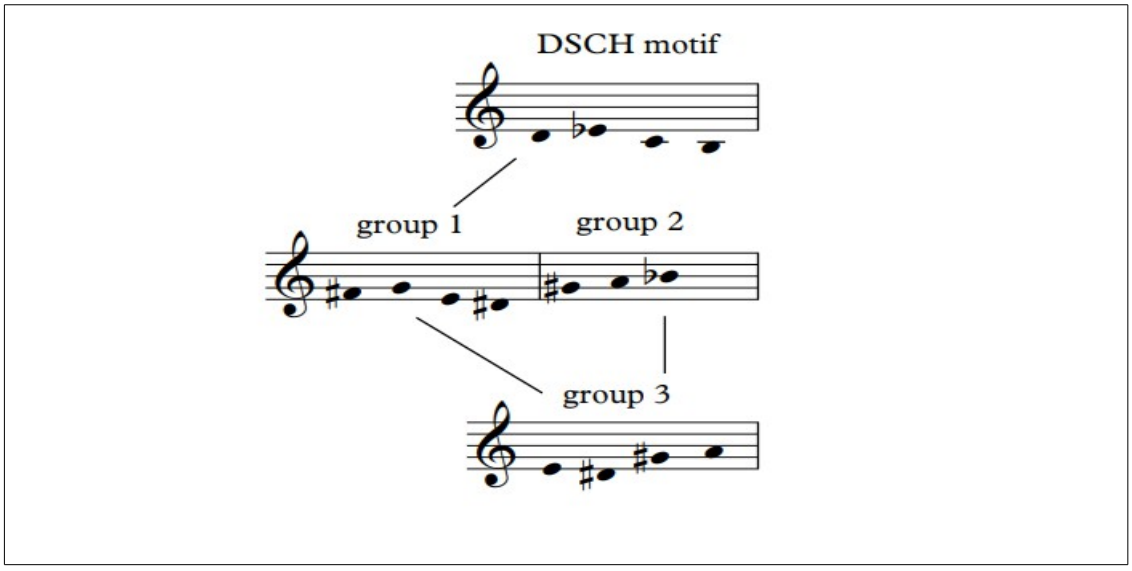
Due to the piece's length and complexity I will simultaneously explain the decisions behind structure, harmony, texture and other parameters while I provide the research context that influenced the first movement. I will, then, move to the movements' comparison and explain the decisions regarding the second movement.

3.1.2 Pitch material, harmony, and texture

1st movement: 'Positive'

This movement has four sections which are mainly defined by their pitch material and texture. It is worth mentioning that there is an intentional lack of surprises, as my goal was to create and maintain an even soundscape. To do so, all four instruments play throughout, with the exception of section B where the violin I is missing. Section A was the only one to be mapped in SketchUp in great detail. At that point I was considering using the visualisations instead of a traditionally-notated score, an idea that finally took shape in the two pieces discussed in chapter 5.

The pitch material consists of F#-G-E-D# (group 1) in section A, and G#-A-B♭ (group 2) in section B. These two are later combined to E-D#-G#-A (group 3) in sections C and D. Group 1 was inspired by Dmitri Shostakovich's *String Quartet No.8* (1960), forming the exact same intervals as the DSCH motif (Example 4). The main difference with his approach is that this material does not appear clearly as a fixed motif as each instrument is given one of the four pitches. From bar 29 they start exchanging them, causing instability to what was established, and preparing the listener for the next section. Scelsi's influence is clear, with section B driven exclusively by the pitch 'A' and the friction created by all pitched content being seconds.

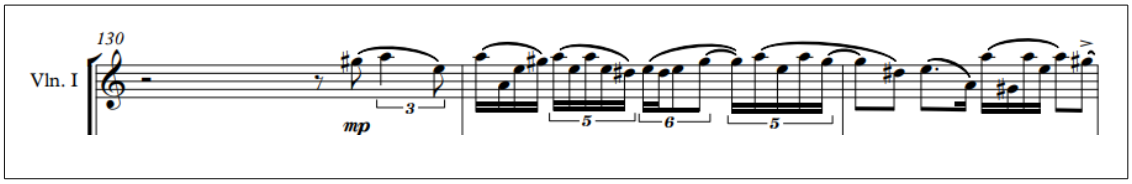


Ex. 4 – *Within the curves*, group of pitches

As a result, vertical harmony can be understood as static in the first two sections. I also focused on the horizontal events treating each instrument as an individual. My goal was to work from pitch independence (all pitches were of equal importance) to harmonic connection that could resemble functional harmony (chosen pitches could be heard as subtonics or dominants to others, depending on the intervals they form). I intend that this does not step in the way of harmonic stasis, with this connection only becoming apparent to a listener towards the end.

The harmonic connection happened gradually. To begin with, the pitch E of group 1 could be considered as a dominant to pitch A of group 2. This can be seen between bars 39-45 in the violoncello part as E and A form a perfect fourth interval. I considered this

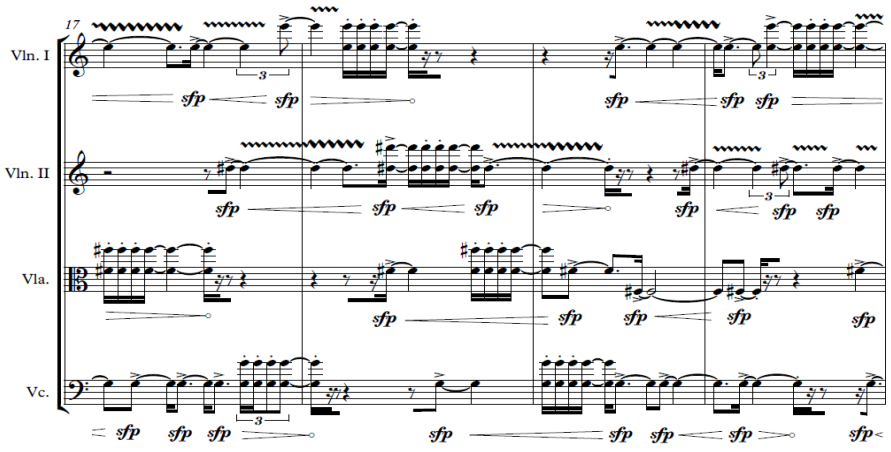
as the bass of a perfect cadence. Secondly, I personally considered that group 3 is built around a tonal centre of E major scale with a repetitive focus on the G#-A and D#-E connections mostly heard in violin I from bar 94. Focusing on this specific scale helped me remain focused for the second half of the piece. This is also the first time this line is heard, that is later expanded in section D (Example 5). In order to underline such a crucial event, the violin I was intentionally missing during the previous section. The constant fixed rhythmical repetitions (violin I part, bars 145 until the end) were inspired by Philips Glass' (1937-) *Violin Concerto No. 1* (1987). That was the only time I worked with this kind of 'blocky' repetition, as it did not serve my vision for the other pieces.



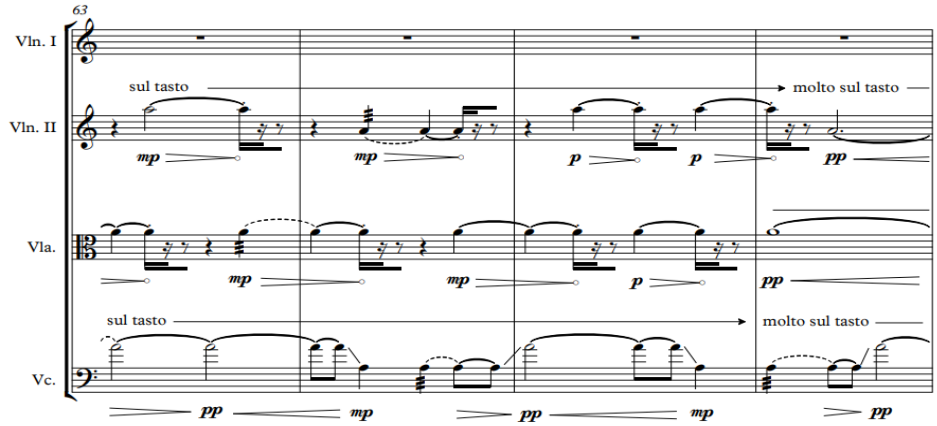
Ex. 5 – *Within the curves,* first movement, bars 130-132

Regarding textures, section A (bars 1-50) and section B (bars 51-78) are built from juxtaposing similar material. The goal was to create a spectrum from monophony to polyphony rather than work with absolutes. In section C (bars 79-103) violin I and violoncello create a duet, while the remaining instruments continue on and around pitch A. During the final section (section D) the texture is based on microholyphony and György Ligeti's influence is undeniable. However, my vision was not to exclusively work with sound masses. An example from each texture is given in Example 6.

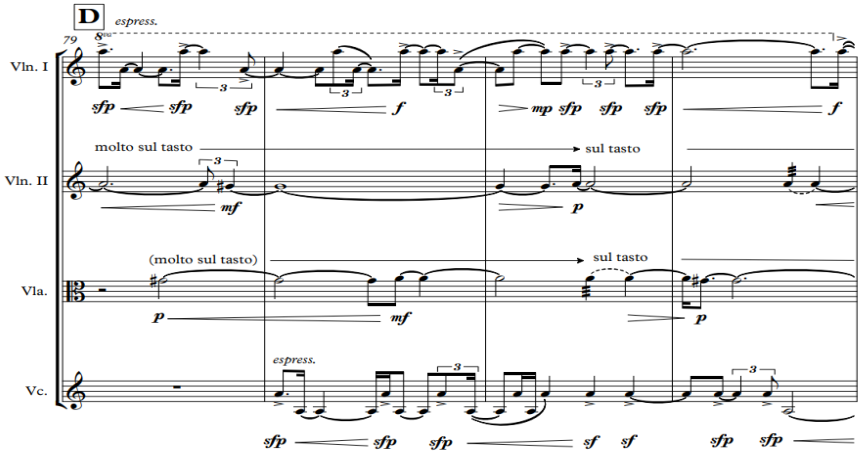
Section A (example: bars 17-20)



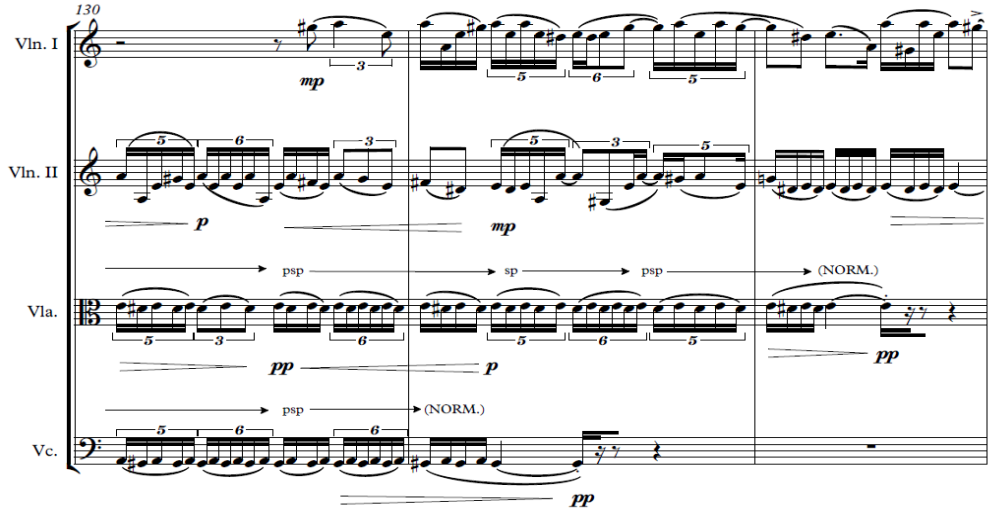
Section B (example: bars 63- 66)



Section C (example: bars 79 - 82)

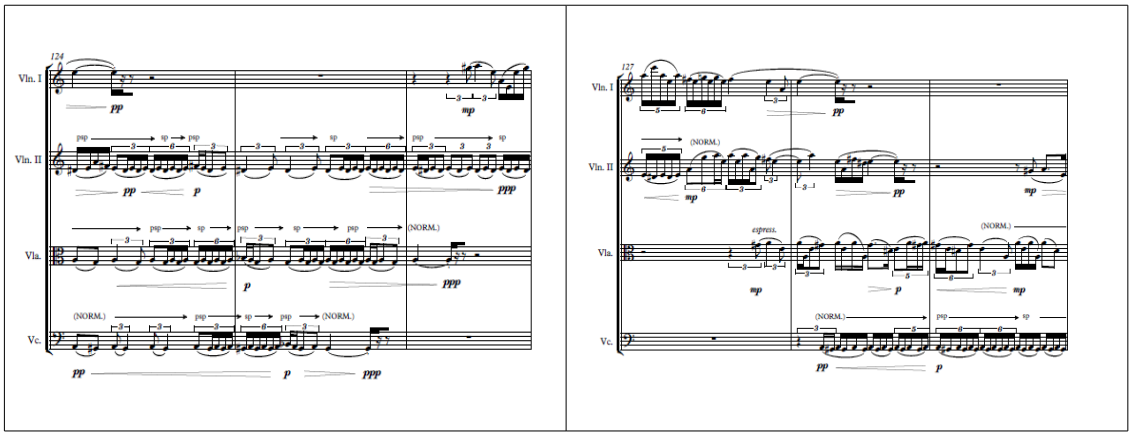


Section D (example: bars 130-132)



Ex. 6 – *Within the curves,* first movement, selected bars of each section

Also in section D, I created waves on the surface of the score by gradually introducing and removing the instruments (Example 7). This is actually the first and the last time wavy patterns appear on my scores, as they did not serve my vison for the other portfolio pieces. This was also the only section without a separate visualisation as it can be seen as a two-dimensional visualisation itself.



Ex. 7 – *Within the curves,* first movement, bars 124-129, wavy patterns

3.1.3 Register, timbre, and rhythm

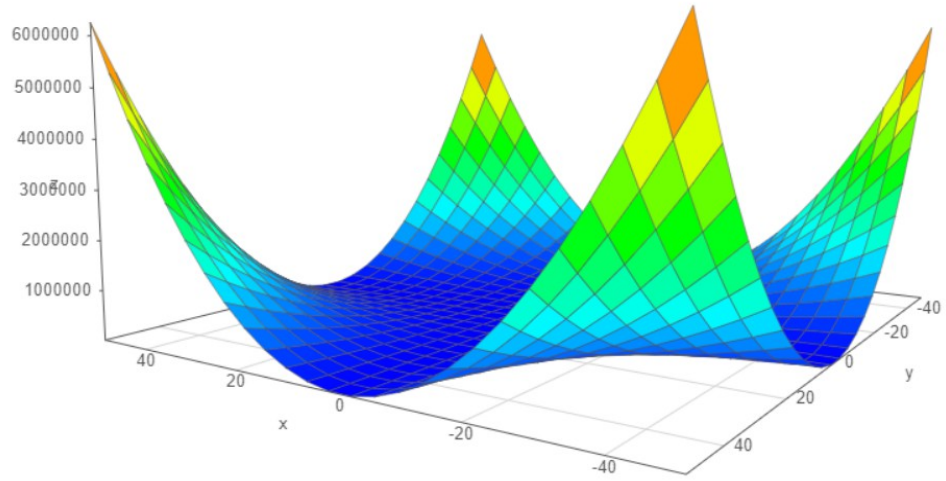
One of my main goals in *Within the Curves* was to move gradually between several timbral qualities, and extremes of register. To do that, I engaged with plane curved surfaces derived from a plotter, as the results of mathematical expressions in terms of x and y. They are explained in Example 8. I was inspired by the story behind the curved shape of Philips Pavilion 'adapted from a technique of notation [Xenakis] invented for the composition of polyvalent music'.[20]However, my curves' shape was creatively placed on the timeline, helping me coordinate the available range of the chosen parameters. As a result, the planes work as algorithms but are treated more creatively. What is more, the curvy shape indicated in itself that at any given moment all parameters are constantly shifting positions. That was translated on the score in sections B and C with arrows that instruct the performers to constantly adjust (Example 9).

Through the first two sections, the rhythm is driven by long sustained notes with

20 Iannis Xenakis and Iannis Le Corbusier, *'Philips Pavilion'* (ANY:Architecture New York, no.5, 1994), 34 (www.jstor.org/stable/41845639) (accessed 29 May 2021)

interruption with faster values, such as the semiquavers in bars 17-21. These long notes allow various vibrato techniques to be explored, and they highlight even the slightest differentiation in dynamics. The alteration of tuplets during the last section created the illusion of acceleration, and therefore movement, within the static micropolyphonic texture.

Curved surface No.1: [z= (x*y)^2], bars 51-67



x axis: instrumentation.
Point 40: violin II (the edge of the surface)

Point 0: viola (middle of the surface)

Point -40: violoncello (the other edge of the surface)

y axis: time (bars). The five points of this axis (40, 20, 0, -20,-40) represent bars 51, 56, 57, 63, and 66.

z axis: from top to the bottom:

Point 6000000: molto sul tasto

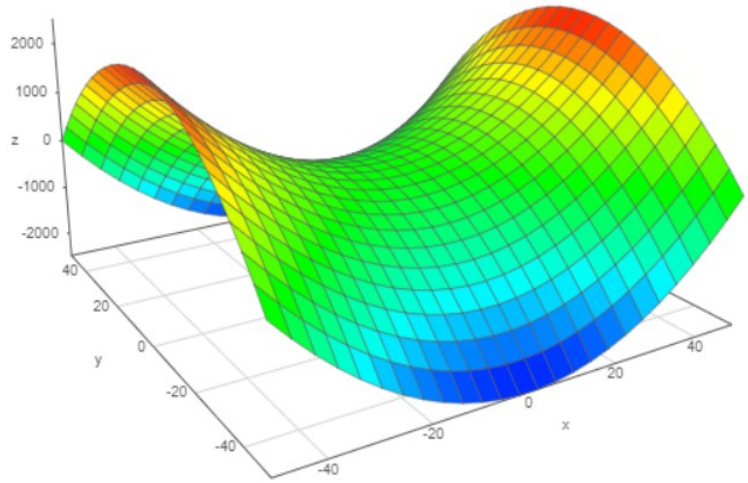
Point 4000000: sul tasto

Point 3000000: (NORM. playing)

Point 2000000: sul ponticello

Point 1000000: molto sul pont.

Curved surface No.2: [z= x^2-y^2], bars 68-78



y axis: instrumentation

Point 40: violin II

Point 0: viola

Point -40: violoncello

x axis: time (bars). The five points (-40,-20, 0, 20, 40) of this axis represent bars 68, 70, 71, 73, and 75.

z axis: from top to bottom

Point 2000: molto sul tasto

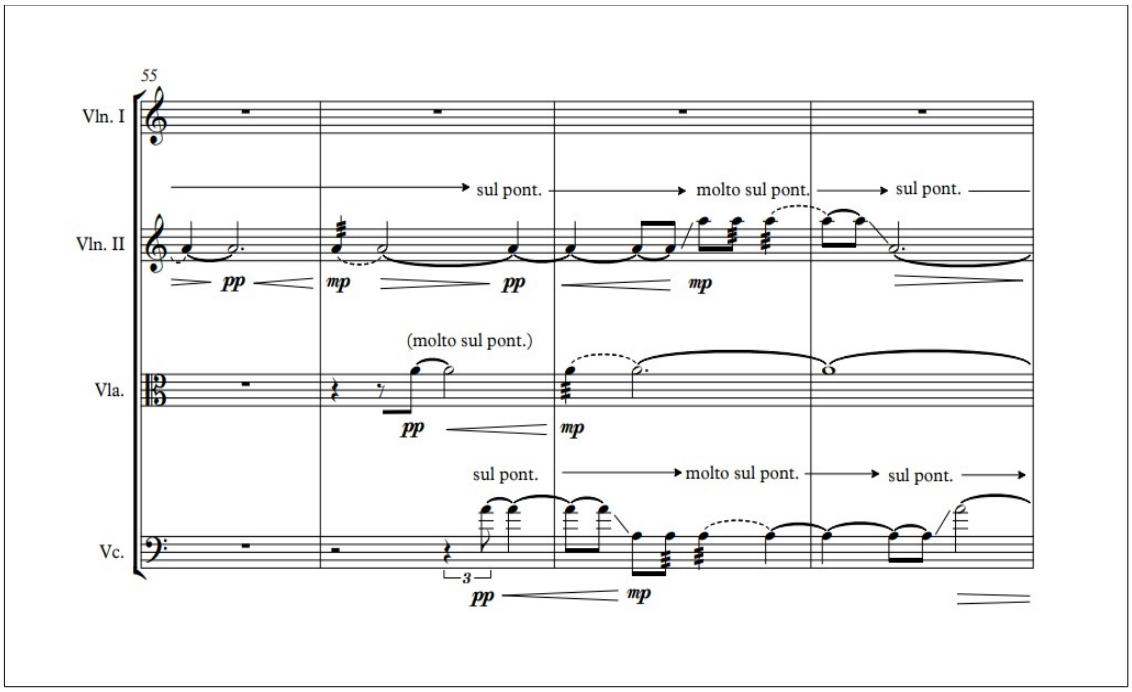
Point 1000: sul tasto

Point 0: (NORM.)

Point -1000: sul ponticello

Point -2000: molto sul pont.

Ex. 8 – *Within the curves,* first movement, curved surfaces from a plotter



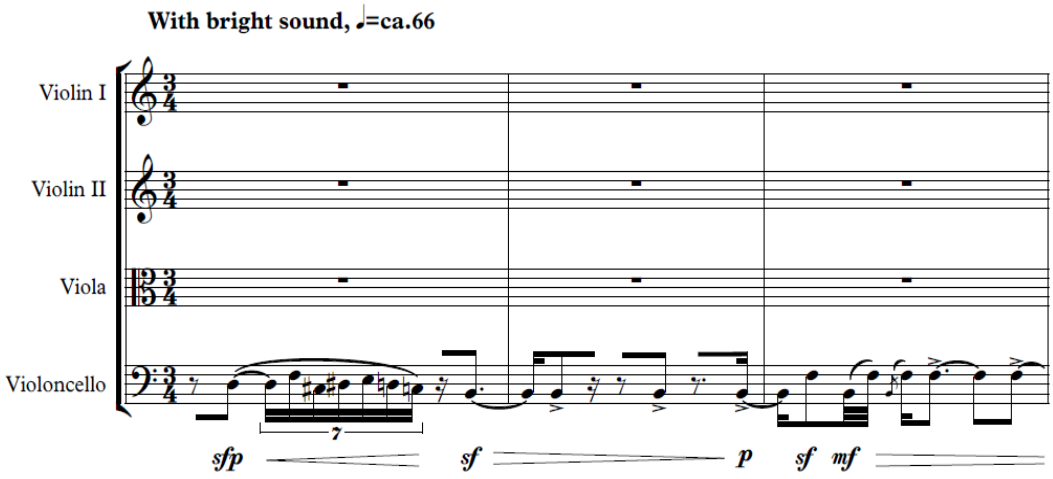
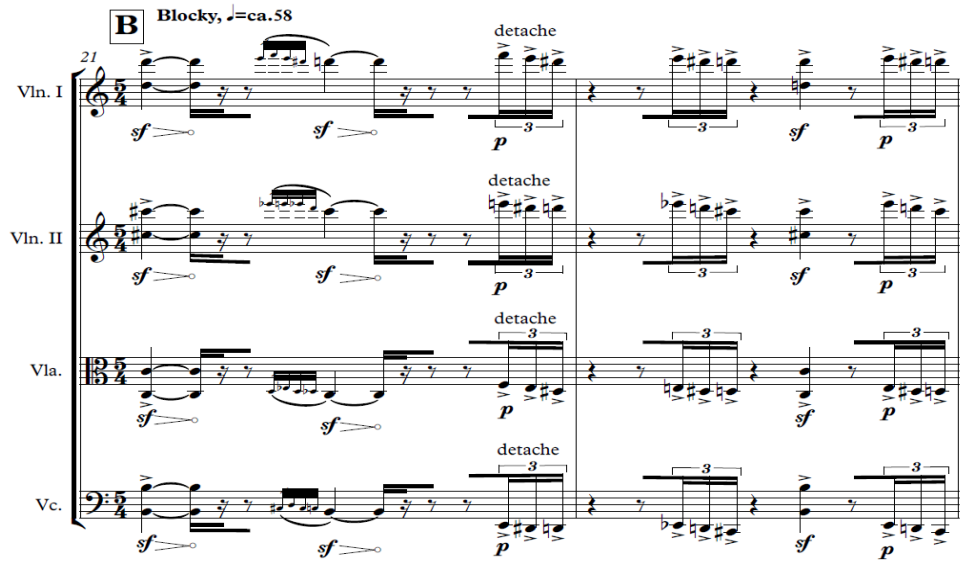
Ex. 9 – *Within the curves,* first movement, arrows on the score, bars 55-58

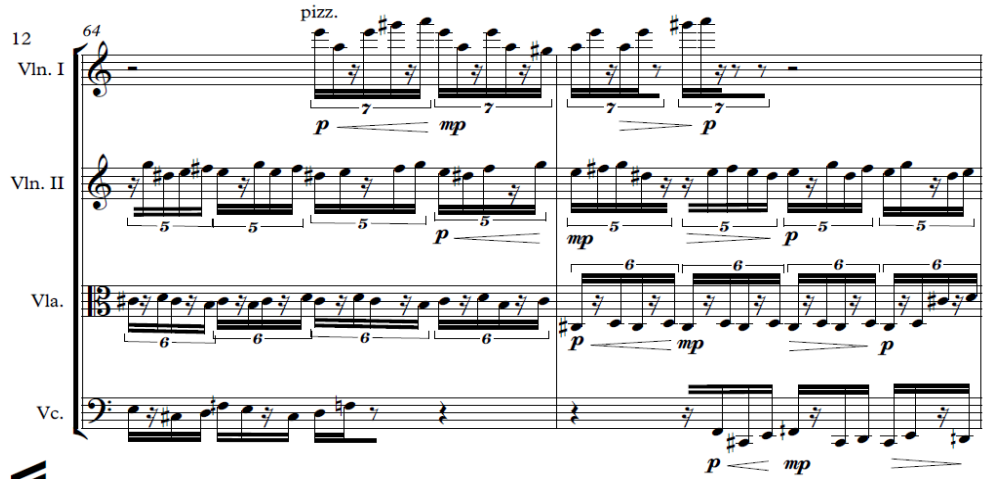
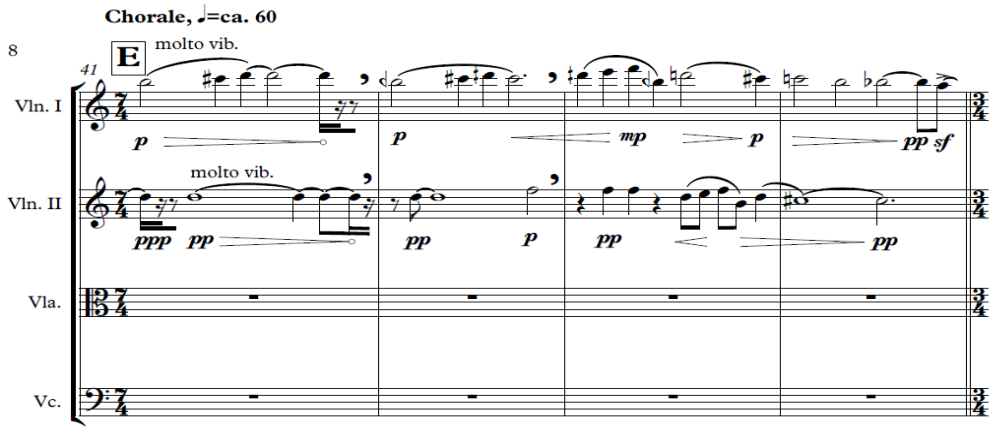
3.1.4 Contrast

2nd movement: 'Negative'

For the second movement I followed a completely different approach, prioritising contrast over other parameters. Below, I will explore how contrast challenged some of my basic aesthetic approaches, and how I balanced these two.

This movement was also organised on a four-section basis. Each section has its own instrumentation, time signature, and texture, providing each a unique character. Within the piece there are also several hybrid sections to help with cohesion. The order and characteristics of the sections can be seen in Examples 10 and 11. The whole movement was visualised exclusively in SketchUp, entirely relying on the software to explore its limits. The only parameter that was excluded from the visualisation process was rhythm. Similarly to the first movement, the rhythm was based in intuition, as I still wanted to engage with a filigree surface and remain loyal to this part of my aesthetic.

Section 1 (example: bars 1-3)
Instrumentation: **solo**
Time signature: **3/4**
Character: **bright sound**
Texture: **scratch notes, double stops**

Section 2 (example: bars 21-22)
Instrumentation: **quartet**
Time signature: **5/4**
Character: **Blocky**
Texture: **homophonic/homorhythmic**


Section 3 (example: bars 64-65)
Instrumentation: **trio**
Time signature: **4/4**
Character: **Scattered**
Texture: **micropolyphony**

Section 4 (example: bars 41-44)
Instrumentation: **duo**
Time signature:**7/4**
Character: **Chorale**
Texture: **counterpoint (two voices)**


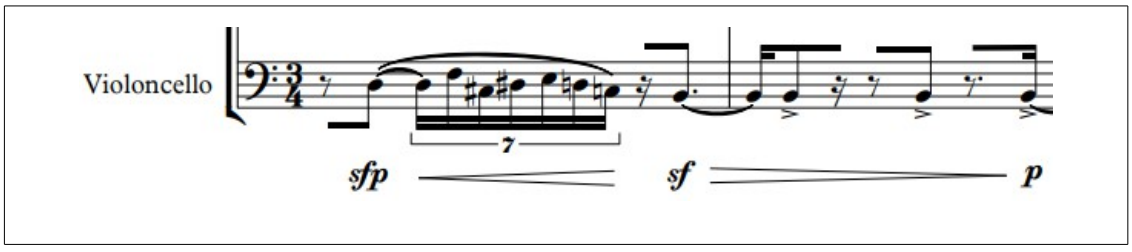
Ex. 10 – *Within the curves,* second movement, characteristics of each section

It is possible to see in Example 11 that the section numbered as 'Section 3' appears after the section numbered as 'Section 4'. When I organised the piece, I envisioned the musical characteristics of each section separately, while numbering the sections. Then, I put the sections in the order below without changing their initial sequence number.

Bars 1-20	Section 1
Bars 21-23	Section 2
Bars 24-40	Hybrid section formed by combining sections 1 and 2
Bars 41-44	Section 4
Bars 45-48	Section 1
Bars 49-50	Section 2
Bars 51-52	Section 1
Bar 53	Section 2
Bars 54-55	Section 1
Bars 56-58	Hybrid section formed by combining sections 2 and 3
Bars 59-80	Section 3
Bars 81-87	Hybrid section formed by combining sections 1, 3 and 4
Bars 88-94	Section 1
Bars 95-101	Hybrid section formed by combining sections 1 and 2
Bars 102-112	Hybrid section formed by combining sections 1 and 4

Ex. 11 – *Within the curves,* second movement, order of the sections and relevant bars

What is more, the very first bar of section 1 accommodates the main motif that appears throughout the movement as a connecting element (Example 12). My intention was to instantly provide the listener with a fixed motif in comparison with the first movement where a fixed motif (Example 5) appears towards the end. The augmented fourth between B and F as seen in bar 3 appears as an interval here for the first time. I was so pleased with its sound that it became a defining element within my aesthetic through other portfolio pieces.



Ex. 12 – *Within the curves,* second movement, main motif, bar 1

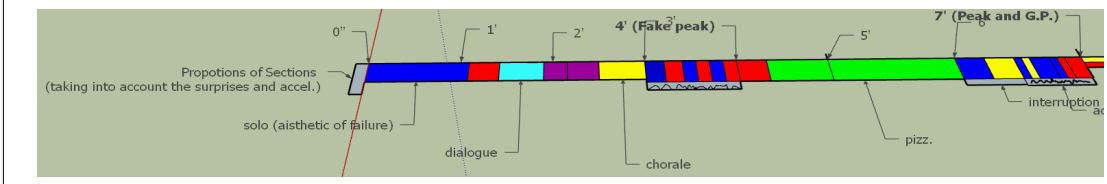
Moreover, it is important to mention that this movement does not include any indication of timbre. Sul tasto and sul ponticello are intentionally absent, as they had a central role in the first movement. The players are instructed to play with normal bowing throughout. This movement appears timbrally dull in comparison with the first movement. This was perhaps not the best decision in terms of timbre, but I was otherwise pleased with the extract I heard from the Solem Quartet.

Another difference is that greater attention is given to vertical events. Harmony can be heard as static in places but not overall, as each section is built on unrelated pitch content. Therefore, once again I prioritised contrast over harmonic stasis. As the movements are not meant to be performed separately and much stasis would have already been heard, however, I allowed myself to move away from that part of my aesthetic to explore the other side of the spectrum.

Below, a table of contrasting characteristics between the two movements is provided (Example 13). For this movement, I also organised in advance the proportion of each section as shown in Example 14. This later helped me organise character as discussed in 3.1.5.

1st movement ('Positive')	**2nd movement ('Negative')**
Long rhythmic values	Fast rhythmic patterns (also grace notes)
Focus on the horizontal events	Focus on both the horizontal and vertical events
4/4 exclusively	¾, 4/4, 5/4, 7/4
Tones/ Semitones	Tones/ Semitones/ Microtones
Section A→ Section B→ Section C→ Section D (clearly defined Sections)	Moving freely between Sections 1-4 (exchange of characteristics/Hybrid Sections)
All the players perform mostly throughout the piece	Groups of solos, duos, trios, quartet
Moving gradually between the registers	Moving rapidly between the registers
Sul pont.// Sul tasto	Normal
Character: radiant → mysterious	Moving between a variety of characters
Equal length of Sections (approx. 2 min. each)	Different length of Sections (3D mapping)

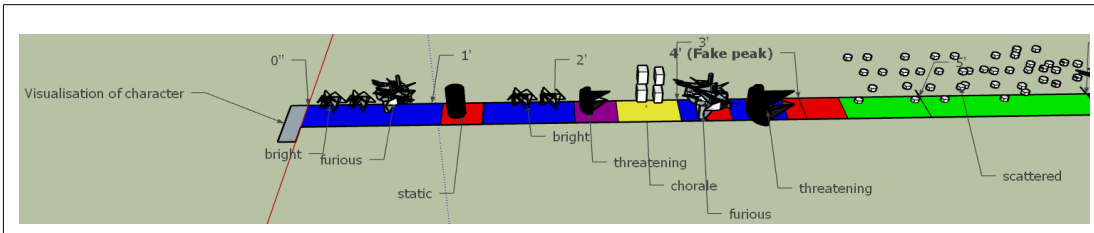
Ex. 13 – *Within the curves*, table of contasting characteristics in both movements



Ex. 14 – Visualising proportions of sections in *Within the curves,* second movement

3.1.5 Addressing the research questions and reflecting on the experience

As mentioned in the Introduction, question 1a referred to my method as a stimulus to explore a distinctive path in composition. After completing *Within the curves* I realised that the visualisations not only pushed me to combine static with constantly transforming elements, but also inspired me to focus on the piece's character. Character is derived by combination of the parameters but, for this piece, I visualised it through abstract shapes and placed it on a timeline (Example 15). As a result, character became an integral part of the pre-compositional process, a measurable parameter which would define form. The feedback I gained from this was a turning point for me and, since then, I have always thought about the development of each piece's character even without a SketchUp visualisation.



Ex. 15 – Visualising character in *Within the curves,* second movement

In addition, this piece helped me understand that harmony and texture can also move from being simpler to be more complicated and vice versa. Harmonic stasis can still be achieved within these two and *Within the Curves* showed that I can explore that without ruining my aesthetic.

Regarding the third research question, texture and structure were, indeed, affected by both pitch material and surface's rhythm. Treating the pitch material as four individual, and simultaneously related, sounding paths and the movements as total opposites were the musical goals. Texture and rhythm worked hand in hand to serve pitch material and without allowing the structure to fall apart.

3.2 *Complexity* – clarinet A solo

3.2.1 The illusion of polyphony

My main goal with *Complexity* was to explore how to achieve harmonic stasic through rhythmic fluidity, fragmentation of pitch-groups, and interference. I was also interested in creating an illusion of polyphony for a solo monophonic instrument with the help of distinctive textural layers, and exploring how much these layers can differentiate without the form falling apart, and whether my three-dimensional method is suitable for monophonic instruments.

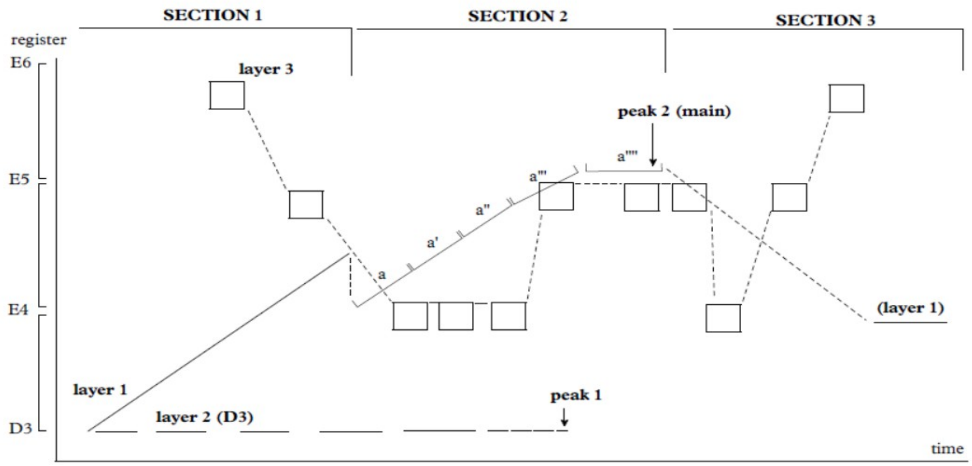
I studied several scores during the initial stages of composition, but the one with the greatest impact was Saariaho's *Laconisme de l'aile* (1982) for solo flute and optional electronics. Saariaho notes ′my intention [...] was to create an impression of polyphony on several levels for a solo instrument, to expand the melodic line in some way′.[21] The main difference is that I worked without any multiphonics. Another inspiration was her piece *DUFT* (2012) for solo clarinet.

3.2.2 Static harmony within textural and rhythmical fluidity

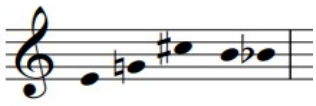
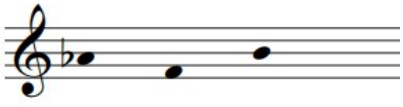
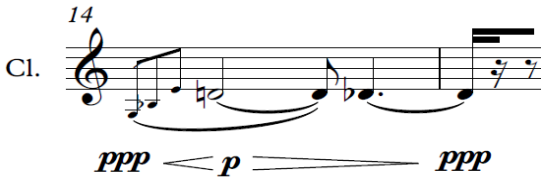
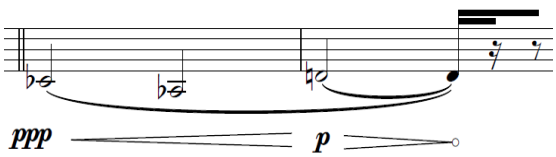
Complexity is divided into three sections. The most interesting feature of its macro structure is that all the musical information can be heard during the first section. The middle section functions structurally as an extension to what has already been established, and the last section as a coda. The sections appear in (Example 16).

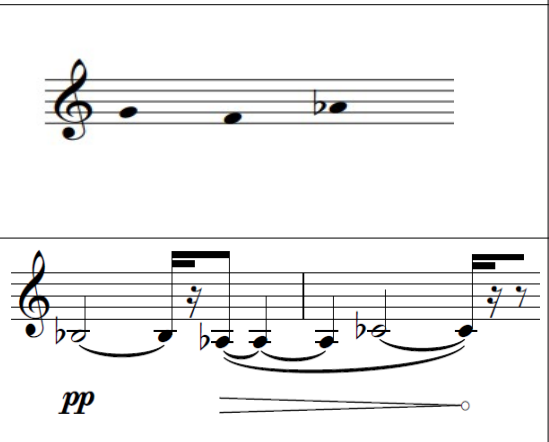
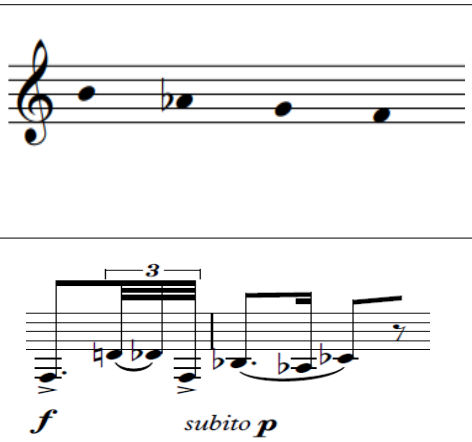
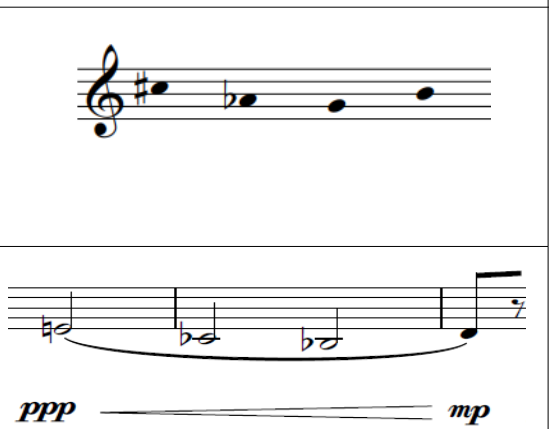
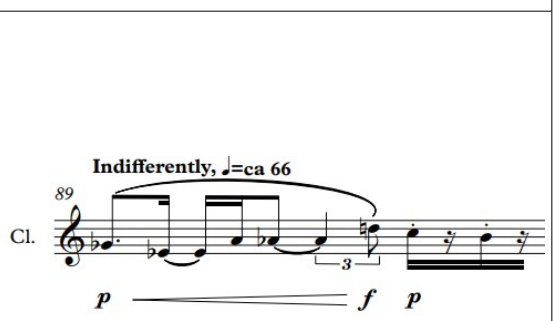
21 Kaija Saariaho, *Timbre and harmony: Interpolations of timbral structures* (Contemporary Music Reviews, 2:1, 1987, 93-133), 94, (DOI:10.1080/07494468708567055) (accessed 15 December 2021)

The piece is based on establishing its harmony through pitch related groups.This ensures that harmony will remain static throughout. Unlike in *Within the curves*, there were no particular intentions of functional tonal relationships between the chosen pitches. The pitches appear one by one as fixed motifs and steadily fragment. They are applied across three textural layers. For **layer 1** I chose E-G-C#-F-A♭-B-B♭ organised in five pitch combinations: Pitch subset 1: E-G-C#-B-B♭ (main motif), Pitch subset 2: A♭-F-B, Pitch subset 3: G-F-A♭, Pitch subset 4: B-A♭-G-F, and Pitch subset 5: C#-A♭-G-B. For **layer 3**, I chose C-D-E♭-B-B♭, and for **layer 2**, I decided to work exclusively with D3 (the piece's lowest pitch), which would interfere with layer 1 (Example 17 and 18).

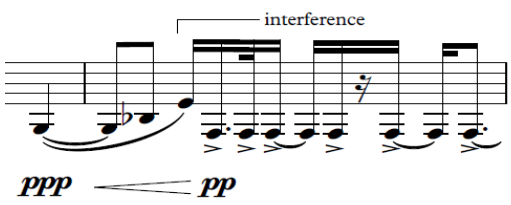
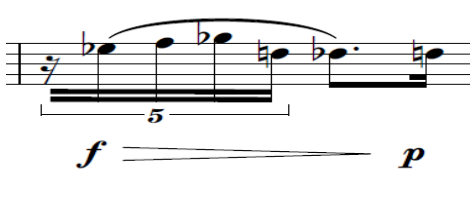


Ex. 16 – Sections and layers in *Complexity* (they appear equal in length for display reasons)

Layer 1 pitch subsets examples	
Pitch subset 1: bars 14-15	**Pitch subset 2:** bars 24-25
	
	

Pitch subset 3: bars 26-27	**Pitch subset 4:** bars 48-49
	
Pitch subset 5: C#-A♭-G-B (bars 72-74)	**Fixed 'a' pattern** (bar 89)
	

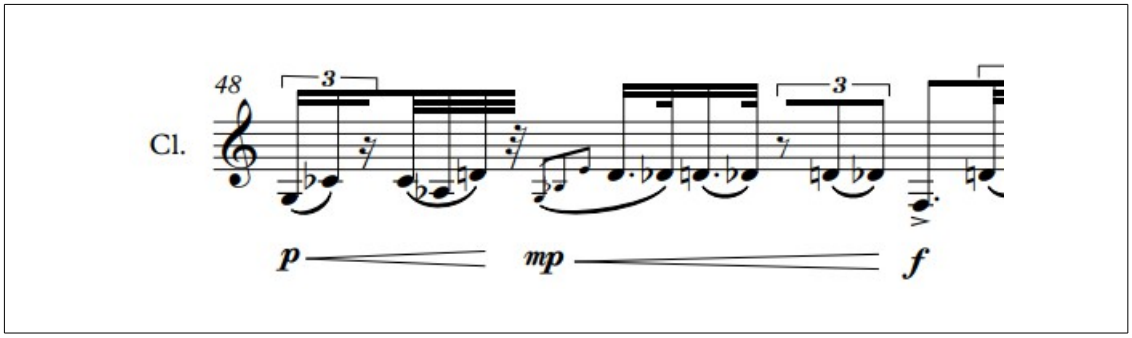
Ex. 17 – Pitch subsets (layer 1) in *Complexity* (transposed excerpt)

Layer 2 (bars 3-4)	**Layer 3** (bar 76)
	

Ex. 18 – Layers 2 and 3 in *Complexity* (transposed excerpt)

Section 1 (bars 1-88): this opening is a short, micro version of what occurs across the rest of the piece: *motif (bar 1-2)→ interfering layer (bars 4) → fragmentation of motif 1 (bars 5-6,8)→ 'failure' (bar 15)→ repetition (bars 17-23) → next motif (bar 24).* It is the only section with a three-dimensional visualisation, as it contains enough musical information that the rest of the piece could stem from it. This time the SketchUp visualisations included the rhythmic surface (one can see in the video the indications 'grace/fast notes' and 'offbeat rhythm'). The rest of the rhythm was decided intuitively to create a filigree surface (Example 19).

The usage of compact/fragmented three-dimensional shapes in SketchUp did not prevent me from gradually developing the parameters.The shapes mostly represented the events' density over time. Taking decisions regarding density firstly appeared in *Complexity*, but it was expanded in the chamber ensemble piece and in the pieces discussed in chapter 5.



Ex. 19 – *filigree surface* in *Complexity,* bar 48 (transposed excerpt)

In **Section 2 (bars 89-108)** the character changes constantly. As shown in Example 17 above, 'a' is a fixed pattern repeated four times sounding a major 3rd above on each repetition. There is not an organisation of establishing and fragmenting the patterns as happened in Section 1. This shows that what was established as a sequence of events is now steadily abandoned. In **Section 3 (bars 109-117)** has layer 3 materials and it does not introduce any new ideas. Its role is to release the tension built during the previous sections.

As we see, the fragmentation of a motif appears in both the macro structure (sections 2 and 3 deconstruct section 1) as well the micro structure (fragmented motifs). Sudden jumps in register define the sections. At the same time rhythmic 'failure' helps the piece rhythmically progress within its overall stasis (for example, bars 39-41). In contrast with the string quartet, the piece sustains harmony for long periods without utilising long sustained notes.

Another difference is that textural progression in *Complexity* was the main focus with the pitched material and rhythmic surface serving to reinforce and develop around it. As mentioned in 3.2.1, my vision was to create the illusion of polyphony, which would appear thicker in Section 1 (wider use of the register) and thinner during Sections 2 and 3.

3.2.3 Addressing the research questions

This piece was treated as a case study. I consider it a key piece in my portfolio as it proved that my visualisation method is applicable to solo monophonic writing. In addition, it included all of my aesthetic principles (limited and related pitch content, harmonic stasis, detailed surface, sectional form) encouraging me to follow this direction. In order to address research question 3, it is important to underline one more time that, for this piece, I did partly map the pitch material in SketchUp alongside information regarding rhythmic values unlike in the other traditionally-notated pieces.

Dynamics were not mapped at all, as I view them as reliant upon character and layering. Dynamics also support the overall narrative making it quite dramatic, as it starts very quietly and steadily moves towards the other extreme. This was a use of intuition over planning.

Chapter 4 – narrative, traditionally notated pieces

4.1 *The in-between* – piano solo

4.1.1 General description and goals

The in-between was performed by my supervisor Dr Richard Whalley on the 3rd of April 2019 in Manchester. It is musically connected to *Complexity*, treating pitch material in a similar way (*motif→ fragmentation* or vice versa) and aiming to achieve static harmony through repetition patterns with absence of long sustained notes or monotonal passages. However, the goals here were to explore the application of an extra-musical narrative as a stimulus to musical form. In addition, my creativity and the pre-made visualisations over what is possible and practical could all be balanced in this polyphonic instrument. Later, I will explain how and why I constantly prioritised one or another during the compositional stages. Here, it is crucial to say that playing pitch patterns on my piano has vastly influenced the decisions I took.

The piece describes the experience of sleep paralysis. According to the Encyclopedia Britannica: 'Sleep paralysis, total inability to move for a very brief period that occurs as one is either falling asleep or awakening from sleep. [...] An episode can last a few seconds or a few minutes. In some instances, sleep paralysis is accompanied by hallucinations […] and is closely associated with rapid eye movement (REM) sleep […]'.[22] The piece establishes a narrative, starting with REM sleep and ending when the protagonist wakes up. Duration, frequency and symptoms vary between individuals, so I focused on portraying my own experience. In order to overcome fright during sleep paralysis, my mind attempts to create a secure environment by bringing back happy or calming memories. In this piece, childhood memories are represented by musical quotations.

22 Encyclopedia Britannica, (https://www.britannica.com), (accessed 27 April 2021)

4.1.2 Musical influences

As mentioned in the Introduction, Saariaho's piano pieces worked as a stimulus for mine. I engaged with fragmented tuplets in a similar manner to create a detailed rhythmic surface. Extended pedaling was another characteristic I borrowed from her aesthetic. What is more, she also 'found the idea of dreams […] particularly inspirational in the late 1980s'.[23] In addition, her piece *Im Traume* 'actually has no clear harmony. The harmony that does exist is very static, […] harmony does not seem to play a strong structural role: differences in textural types are of primary importance'.[24] The main difference between our approaches is that *Im Traume* (1980), 'is indeed characterized by rapid changes of tempo and texture [...]′ and ′there are also sudden and extreme changes of dynamic'.[25]In my piece all changes, even interference, do not lead to total sound-distortion. For me, creating and maintaining a particular soundscape was crucial.

In addition, *The in-between* shares some approaches with Takemitsu's *Quotation of Dream-Say sea, take me!* of which Mark Hutchinson[26] notes that 'there are a number of different melodic figures that recur with varying frequency throughout, but variations of timbre also play an important structural role [...]. Alongside this, there are concerns of pitch hierarchy: although there is little in the way of functional tonal harmony here, the piece spends much of its time focused around D, and brief excursions to other focal pitches serve as audible breaks in continuity. Finally, the quotations from *La Mer* serve as perhaps the most obvious formal interruptions, outlooks onto another landscape entirely'.[27] Composing around a single pitch area and using quotations became, steadily, part of my own vision as it will be explained in the following section (4.1.3).

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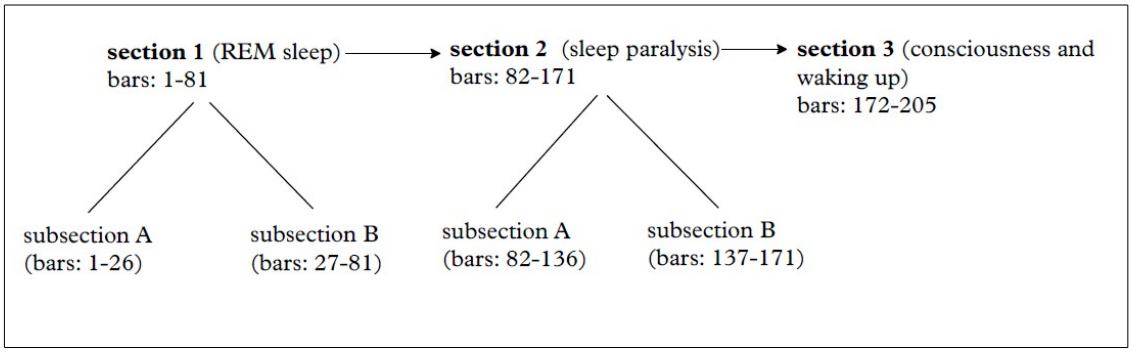
23 Tim Howell, Jon Hargreaves, and Michael Rofe (eds.), Kaija Saariaho: *Visions, Narratives, Dialogues* (Ashgate Publishing, Ltd.,2011), 51
24 Ibid. here 161
25 Ibid. here 44
26 Mark Hutchinson, *Dreams, Gardens, Mirrors:Layers of Narrative in Takemitsu's Quotation of Dream* (Contemporary Music Review, 33:4, 2014, 428-446 (DOI: 10.1080/07494467.2014.977031) (accessed 15 November 2021)
27 Ibid. 437

4.1.3 Pitch cells and quotations

A table regarding sections and the subsections in *The in-between* is given below, with their order matched to the extra-musical narrative (Example 20).



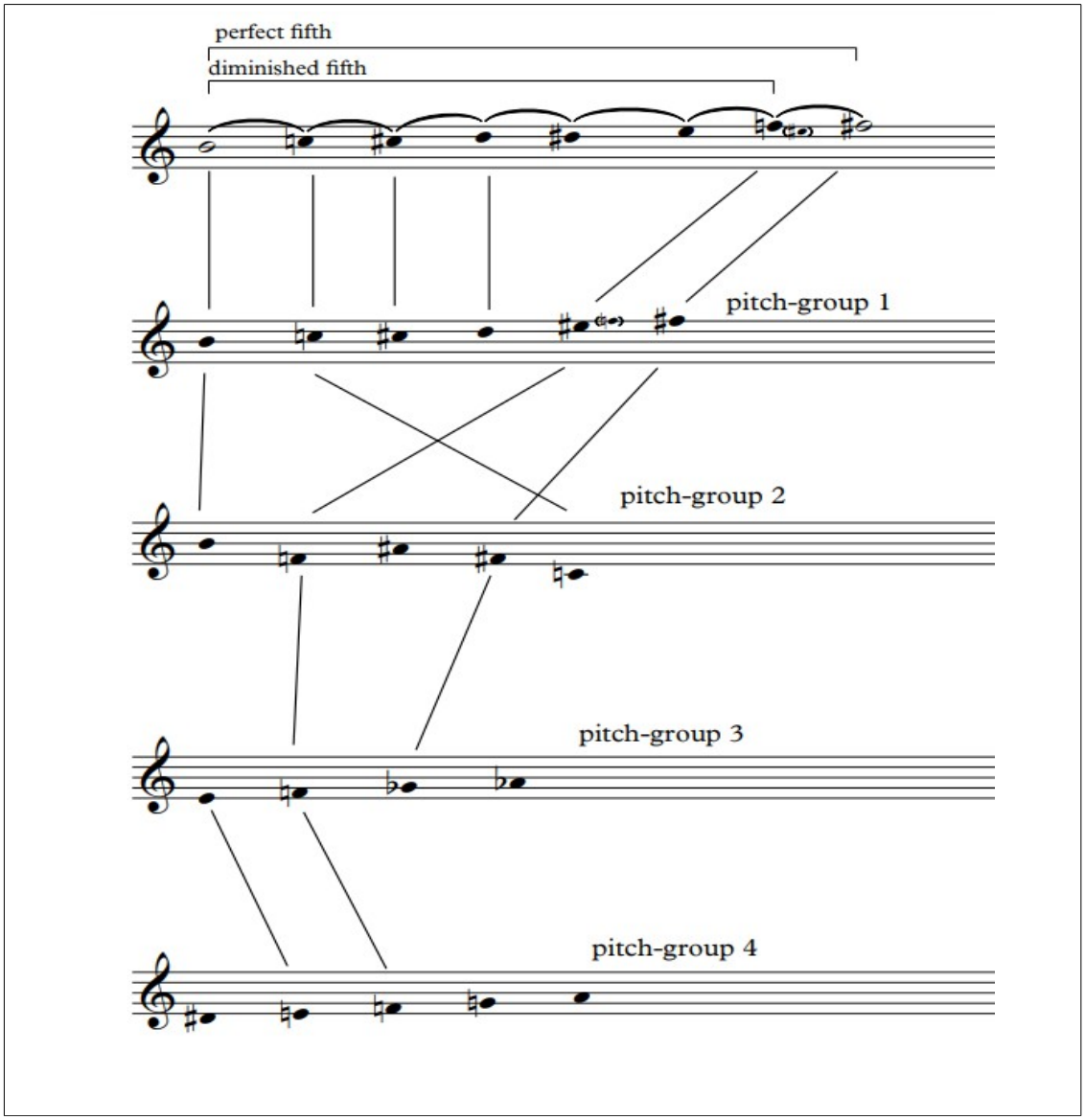
Ex. 20 – Sections and subsections in *The in-between*

I focused around the two lowest Bs of the instrument as my main pitch area. It is important to underline that, for the first twenty five bars, the piece is restricted to two octaves with each hand limited to diminished or perfect fifth (B-F or B-F#). These initial bars attempt to prioritise elements of extra-musical narrative by giving the listener the impression that what they hear is unshaped, wanders freely, though ironically within a limited range. This impression of instability and randomness is enriched through the rhythmic fluidity of the fragmented tuplets and the extended use of pedaling. All these showed how I conceived the creation of a dreamy environment which is unsafe and tense.

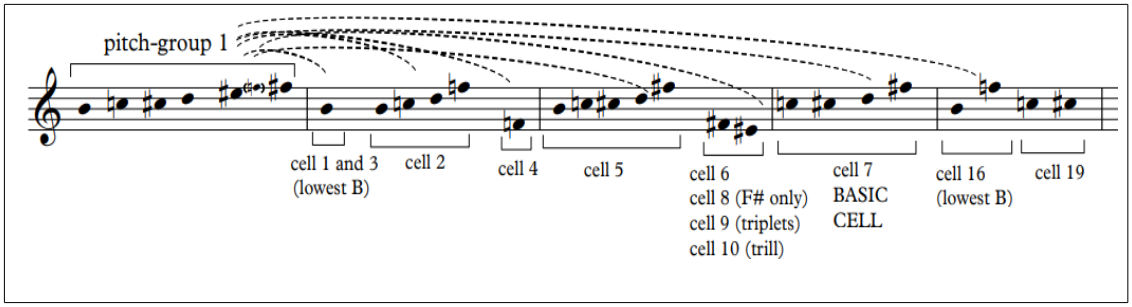
The rest of the pitch material was organised into four pitch-related groups derived from the aforementioned fifths as shown in Example 21. Then, I organised the recurring pitches in what I will refer to as musical cells. There are nineteen of these as shown in Examples 22 and 23. The selection of the cells and the intervals they form was an intuitive process I undertook through trying patterns at the piano. The only cells that were not part of this process were numbers seventeen and eighteen, with which I represented childhood memories in the extra-musical narrative. Musically speaking, they briefly break from the static harmony by providing a sense of a tonal melodic line. The quotations were: Loreena McKennitt's *Tango to Evora*[28], which was turned into a

28 Lorenna McKennitt, studio album *The Visit* (released in 1991)

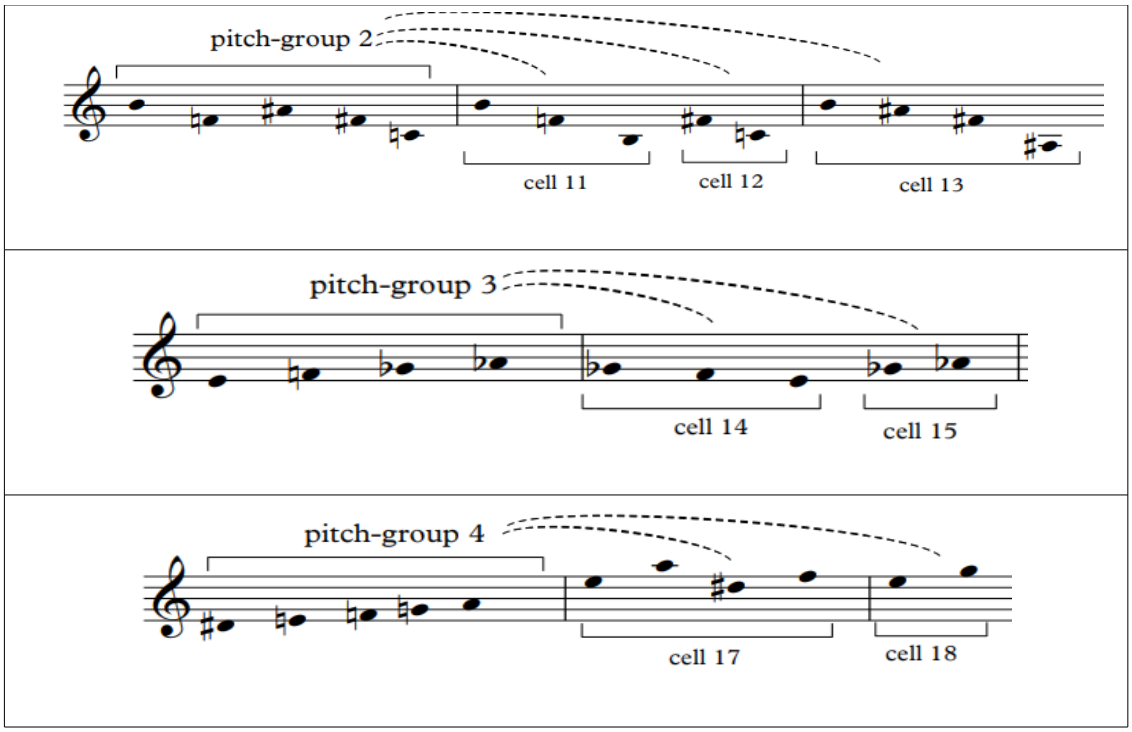
Greek song by the singer Haris Alexiou under the name *To Tango tis Nefelis*[29], and a G-E interval, which I played on the glockenspiel in my first music lesson.



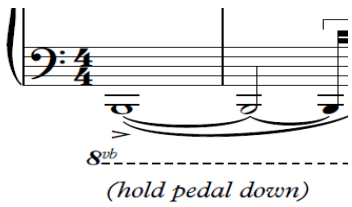
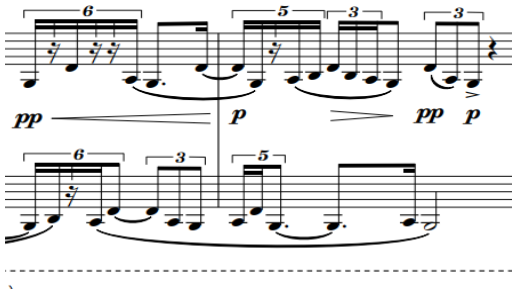
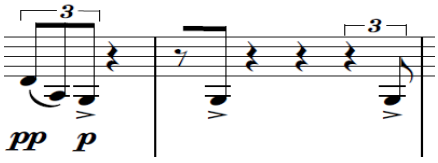
Ex. 21 – Pitch-groups in *The in-between*

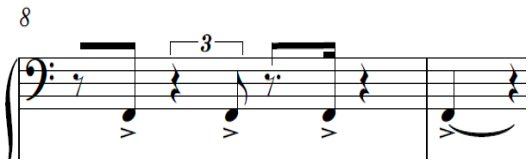
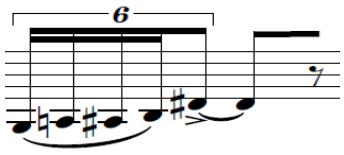
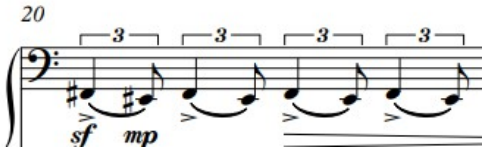
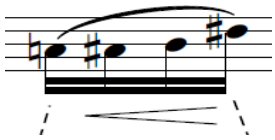
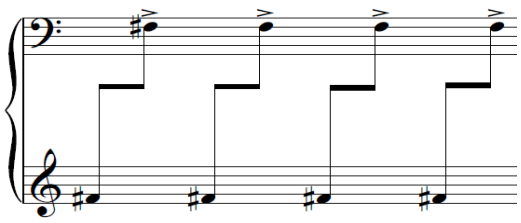
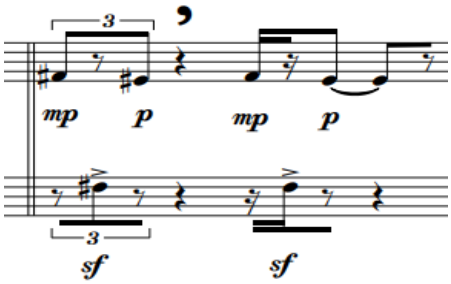
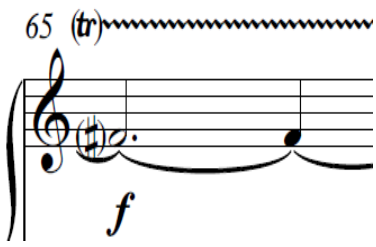


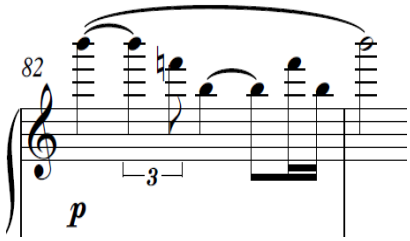
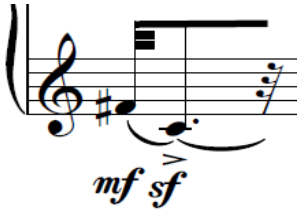
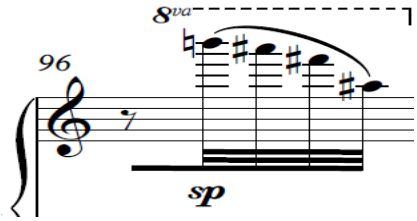
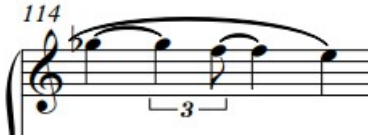
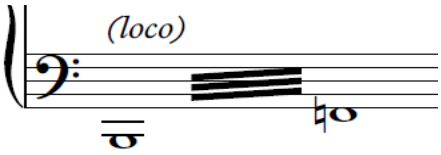
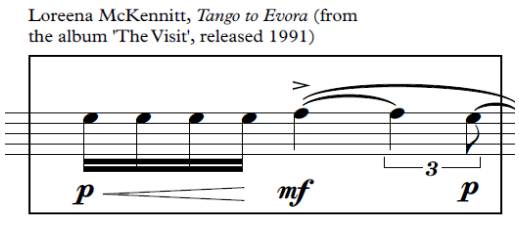
29 Haris Alexiou, live album Gyrizontas Ton Kosmo: Live '92 – '96, (released in 1996)

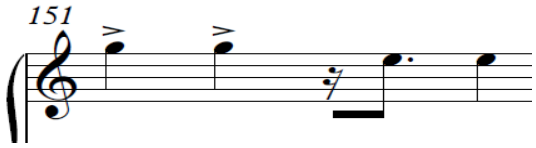
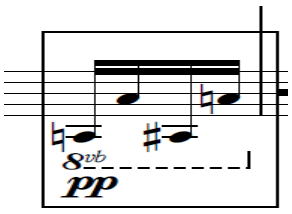


Ex. 22 – Pitch cells in *The in-between*

Cell 1 (bar 1)	
Cell 2 (bar 2-3)	
Cell 3 (bar 4)	

Cell 4 (bar 8-9)	
Cell 5 (bar 12)	
Cell 6 (bar 20)	
Cell 7 (bar 27)	
Cell 8 (bar 50)	
Cell 9 (bar 56)	
Cell 10 (bar 65)	

Cell 11 (bar 82)	
Cell 12 (bar 91)	
Cell 13 (bar 96)	
Cell 14 (bar 114)	
Cell 15 (bar 122)	
Cell 16 (bar 137)	
Cell 17 (bar 139,144) **Quotation**	

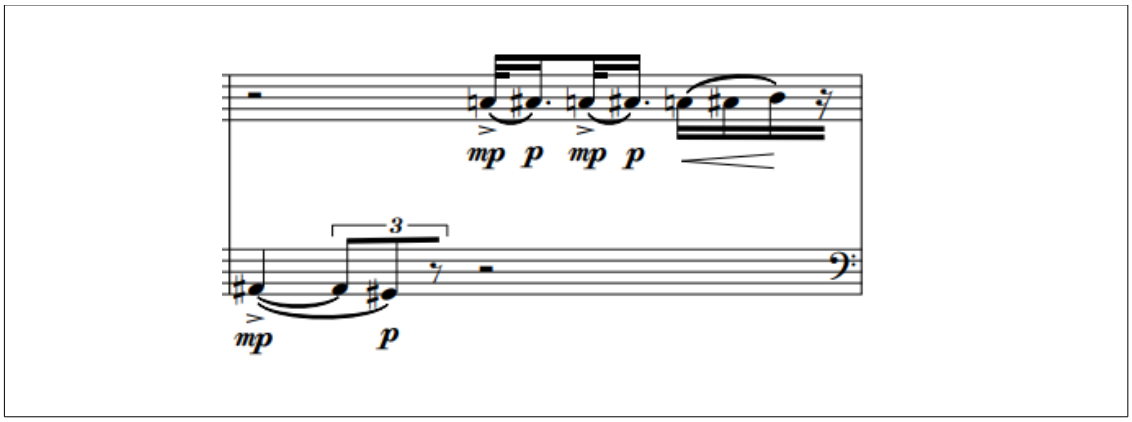
Cell 18 (bar 151)	
Cell 19 (bar 176)	

Ex. 23 – Pitch cells, as they appear on the score, and relevant bars (*The in-between*)

4.1.4 Harmony, rhythmic 'failure', and register

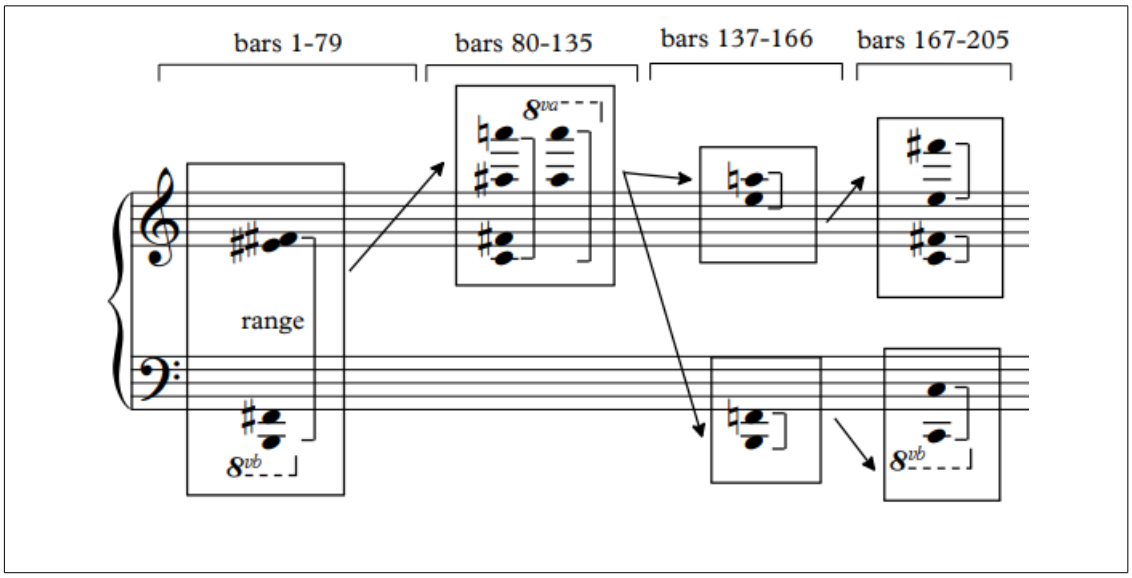
Harmony varies in richness within its stasis, and is dependent on texture and the aforementioned cells. An important differentiation from the approach taken in *Complexity* is that the piano's textures can be thicker while still engaging with a single pitch due to the instrument's polyphonic nature, as seen in bars 50-54. In addition, as mentioned in 4.1.3, the sound of diminished fifths/augmented fourths is of a high importance (cells 2,7,11,12, and 16). Particularly, cells seven and twelve appear throughout the piece as basic cells. The augmented fourths, generally, are symmetrical intervals and they do not show, on their own, any particular harmonic direction. The constant repetitions of these cells and their lack of harmonic direction had an immediate impact on the piece's character, as they underlined a feeling of 'being trapped' in an unpleasant situation.

The development of form is supported through this piece by my reading regarding the *aesthetics of 'failure'*, as mentioned in the introduction. In this piece I focused on rhythmical failures. These appear in the form of short notes in duration as if they were glitches. In my view, they can be seen as second chances for the musical phrase to, finally, come to a completion. The more the phrase 'fails', the more it will try again and, therefore, repeat itself. A prime example of this can be heard in bar 38 (Example 24). Such rhythmical failures allow the reappearance of patterns without necessarily using constant and identical repetitions (as it happens in minimalistic music).



Ex. 24 – Aesthetic of failure, bar 38, (*The in-between*)

Later in the piece (bar 82) there is a distinct registral shift to the high end of the instrument. This was a means of accommodating the dramatic narrative of the piece, creating a distinctive character while maintaining stasis in pitch. Another form of a diminished fifth interval (C-F#, augmented fourth) appears in bar 85 and stays in a consistent register in contrast with other pitch material through this section. During the final high and low registers occur simultaneously. This is primarily in support of structural cohesion, as the piece could easily lose its focus within its suddenly vast tessitura. Similarly to the 1st movement of *Within the curves*, I summarised the musical material of the piece towards the end. In this case the material was the combination of high and low register (Example 25).



Ex. 25 – Macrostructure planning of registers (*The in-between*)

4.1.5 Visualisations and addressing the research questions

With visualisation, I aimed to organise and visualise my musical cells after trying them on the piano. This careful structural organisation is an important contrast with Takemitsu, whose '[...] relative lack of interest in structural organisation was no unconscious failing on his part, but rather a consciously pursued policy'.[30]My visualisations appear in SketchUp as boxes of different colours, named in the video as 'elements'. It is important to mention that the video attached to this commentary shows sixteen of these, as it was made during the early stages of composition. The additional cells were created later after the feedback I received from the performer. Also, it was very helpful for me to map the dynamics and have a clear and complete idea of how they would differentiate, despite any changes I made to the final score. Even slight alterations in dynamics were crucial for texture and form. Between bars 50-70 I engaged with only two pitches. This stands out in spite of harmonic stasis due to dynamic movement (a dramatic crescendo and immediately diminuendo). Addressing the research question no.3, register was not mapped at all, instead being reliant upon pitch. Aside from the impact on structure from this, it was also an integral part of each cell's identity.

Addressing research question No.4, I can safely state that the visual interpretation of structure enabled me to understand whether the time frames I imagined for each section were given enough space to establish character. In contrast to some composers, I felt that turning my emotional narrative into colours and boxes did not compress any of my creativity but instead made me feel secure that what I was composing was practical. On the other hand, the pre-existing narratives did not step in the way of my identity as a composer, as many parameters were determined intuitively. As I also mentioned in the previous chapter, the topic of character, what establishes it and how it can be differentiated within a piece, was constantly in my mind. *The in-between* led me to realise that character development in narrative pieces can itself define structure, especially through build and release of tension. This topic is thoroughly discussed in *Grieving*. There, I applied all the knowledge I gained from balancing visual and narrative to a larger-scale piece.

30 Peter Burt, *The music of Tōru Takemitsu*, (New York: Cambridge University Press, 2001), 243

4.2 *Grieving* – chamber ensemble

4.2.1 General description

Similar to *The in-between*, my intention was to explore how an extra-musical narrative, my creativity, and the pre-made visualisation over what is possible and practical can be balanced in a large-scale piece. *Grieving* focuses on the stages of grief, from initial response to bad news to acceptance. My intention to give emotions a distinctive musical identity in order to be used later to differentiate structure needed careful thought as, on top of register, texture, and harmony I had to consider instrumentation, orchestration, and timbre. Also, in this piece rhythm and the applied rhythmic values were part of the pre-compositional process and were not purely intuitive. What is more, the piece includes principles I explored in my other notated pieces, such as the idea of contrast, 'failure', and interference, but in a more sophisticated way due to my gained experience, and the possibilities afforded by a larger instrumentation. Overall, the piece is characterised again by re-occuring musical material and an evolving sectional form.

As mentioned in the Introduction, most of the visualised information appears fragmented or in the shape of colourful boxes, as that was the most efficient way I could process the information I needed to then work on the score. As *Grieving* was the last piece I composed for this portfolio I knew how to focus on the strenghts of my method. The piece is yet to be performed due to the COVID-19 pandemic so the analysis given below is exclusively based on the score.

4.2.2 The grieving stages

In order to approach this common experience, I researched what is already known on the topic of grief. According to The Kübler-Ross[31] model there are five grieving stages in the following order: Denial, Anger, Bargaining, Depression, Acceptance. I decided to work on my own model of the grieving process, based on the above model, but closer resembling my own experiences, in which these processes are not so clear and linear,

31 Elisabeth Kübler-Ross and David Kessler, *On Grief and Grieving: Finding the Meaning of Grief Through the Five Stages of Loss,* Vol Trade paperback edition (Simon & Schuster UK 2014), (http://web.a.ebscohost.com.manchester.idm.oclc.org/ehost/detail/detail?vid=0&sid=ee48166d-8ceb-4f06-a410-d4d372c148e6%40sdc-v-sessmgr01&bdata=JkF1dGhUeXBlPWlwLHNoaWImc2l0ZT1laG9zdC1saXZl#AN=1970404&db=nlebk), (accessed 27 April 2021)

with regressions and elements of physical pain.

The plan was first to give a verbal definition of each stage, while also imagining the sounds that might characterise them. I then placed them on a timeline creating a narrative to define musical structure. These verbal definitions, and the musical structure read:

- **Initial reaction and echo in the head:** activates immediately after receiving bad news. Usually, there is a sudden increase in heartbeat. The news creates an echo in the mind and the heartbeat steadily reduces.
- **In shock:** the condition that one is unable to feel anything or think clearly.
- **Calming down:** includes both denial and false hope.
- **Anger:** can include uncontrollable crying and screaming. After a while transforms to despair and leads to physical and mental collapse.
- **Physical pain:** headaches, and shortness of breath.
- **Depression:** activates after realising the new situation. Nothing feels good or bad anymore, and nothing is important.
- **Acceptance:** the person slowly, but steadily, goes away from the depression stage.

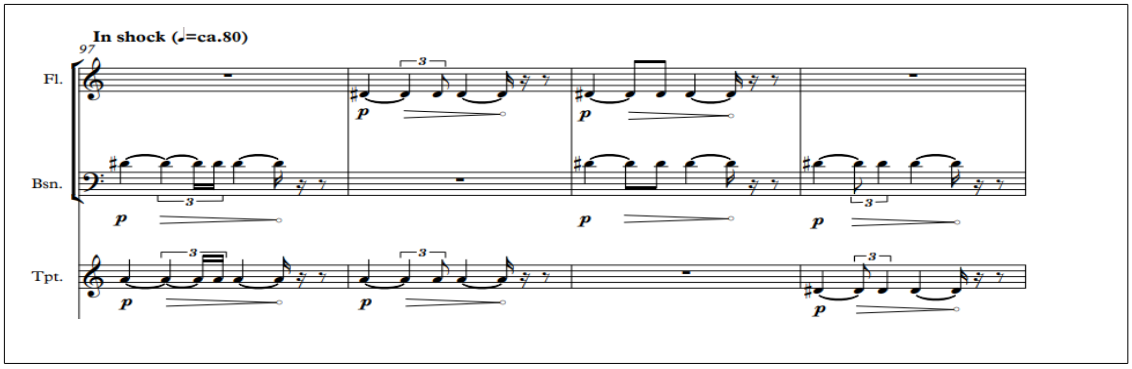
Musical Structure:

Section A: initial reaction (bar 1) → echo in the head (bars 2-34) → in shock (first appearance) (bars 35-55) → **Section B:** calming down (first appearance) (bars 56-96) → in shock (second appearance) (bars 97-116) → anger (first appearance) (bars 117-129) → calming down (second appearance) (bars 130-153) → anger (second appearance) (bars 154- 177) → calming down (third appearance) (bars 178- 189) → anger (third appearance) (bars 190-210) → calming down/anger as a blended section (PEAK of the piece) (bars 211- 241) → **Interlude:** physical pain (bars 242- 284) → **Section C :** depression (bars 285- 362) → depression ↔ acceptance (back and forth) (bars 363- 393) → acceptance *(bars 393-400)*

4.2.3 Research context and influences

I aimed to find other pieces that openly discuss grief, loss, or the expression of related emotions. To begin with, I listened to Kevin Malone's piece *the last memory*. As Malone explains: 'When my father was diagnosed with Alzheimer's disease in 1996, I witnessed how he struggled to differentiate between the reality of current events and memories of past events. […] In response, I wrote this piece to explore my feelings and observations about forgetfulness, flawed memories, so-called genetic memory, storied experiences, short and long term memory, nostalgia and memory loss'.[32]Generally, this quote impacted my overall approach to *Grieving*. A particular musical influence was Malone's use of wind instruments, which I will explore in 4.2.4. In addition, while not a direct musical influence, John Adams' elegy to the victims of 9/11 *on the transmigration of souls* was a particularly inspirational exploration of trauma through music.

Regarding purely technical influences, Scelsi's monotonal approach could not be absent from my most important portfolio piece, partly inspiring the sustained B♭ pitch through the depression section. In addition, I did study many of Saariaho's orchestral pieces, and especially *Laterna Magica* (2009) for orchestra. Futhermore, Krzysztof Penderecki"s piece *Threnody to the Victims of Hirosima* (1960) showed me the strings' highest possible pitch in quiet dynamics (as I utilised in bar 35). Also, Frédéric Chopin's Piano Sonata No.2, Op.35, Lento (Marche funèbre) inspired me to adopt my own marching rhythmic pattern (Example 26). Lastly, Luciano Berios' *Sequenza II* (1963) provided instruction on the extensive use of fast patterns in the harp (from bar 242).



Ex. 26 – Marching rhythm in *Grieving,* bars 97-100 (excerpt at sounding pitch)

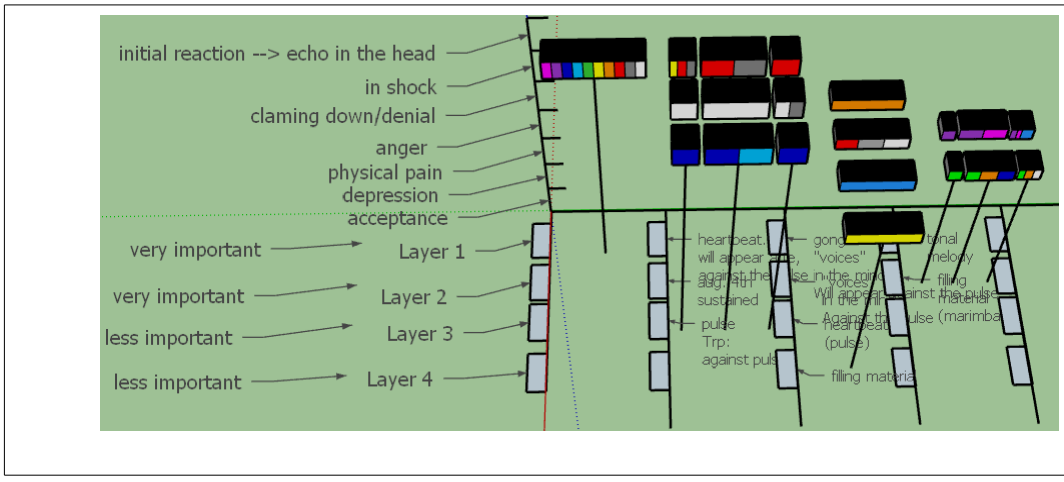
32 Description found in Kevin Malone's programme notes (https://composersedition.com/kevin-malone-the-last-memory-saxophone-version/ (accessed 23 November 2021)

4.2.4 Orchestration, harmony, texture, and rhythm in each of the grieving stages

As stated above, my aim was to use narrative as a means of developing interesting structure while pushing myself through orchestration and overall length. Questions such as how much it would be possible to differentiate a recurring section without necessarily implying rondo form, and which musical parameters could function as connecting factors led me to start by defining each sections' musical identity.

In addition, I decided to work with what I will refer to as 'layers of importance'. Each section consists of between one and four musical layers, placing prime importance on layers one and two. Layer four usually accommodates material such as sustained notes which purely serve to support the harmony, or complement another layer. The main reason I chose this approach was to group musical parameters together, to experiment with texture, and to have a sense of control over them. As soon as I had decided to pre-determine rhythm, I needed a plan of how the other parameters, and, of course, orchestration would develop.

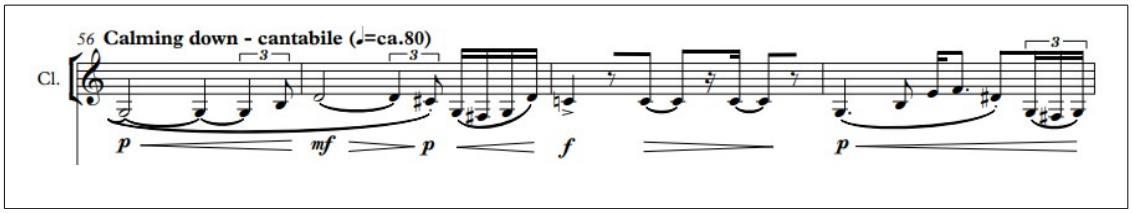
The visualisation process was a trusted tool for this journey and I ended up creating structural visualisations which feature the number of layers for each grieving stage (Example 27). An annotation is provided at the beginning of these videos to match instruments to colours. Other useful information regarding the connection of musical parameters is also provided.



Ex. 27 – Organising the layers and the grieving stages in *Grieving*

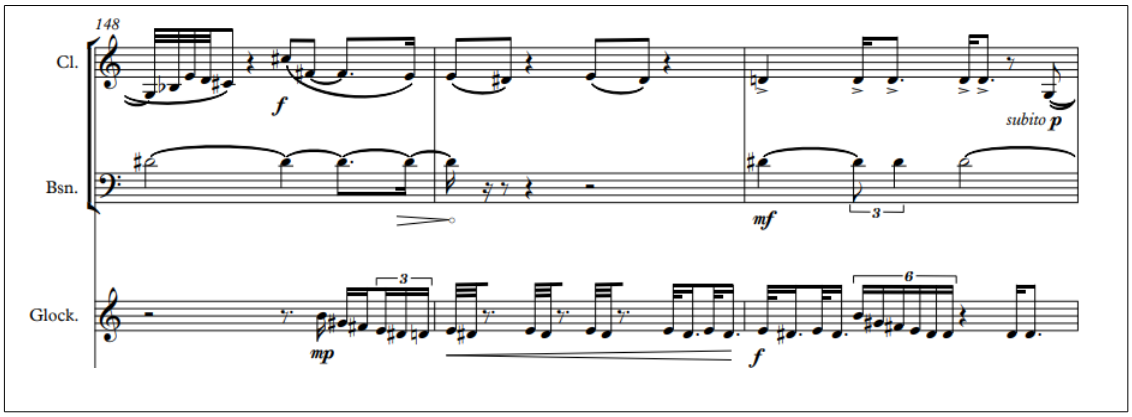
Calming down is the most complicated section, and is one of the two grieving stages which utilised a detailed visualisation on its own. Everything else was musically built around it. Deciding timbre and register was challenging, and I thought that the clarinet would be suitable due to its flexibility in register and capability in quiet dynamics. The clarinet's main melodic line has tonal characteristics, and was built with a focus on G3. This G area was supported with three arpeggiated chords: a G major chord (bar 56-57), an E minor chord (bar 59), and lastly a G minor chord (bar 63). The selection was built around my intuition and on improvisation on the piano. My intention was to compose a lament that could be easily followed by the listener and stay in their memory (Example 28)**.** Another important aspect is that this melodic line constantly appears as if it 'fails' to sound completed. As a result, the line starts over (bars 57, 59, 61, 62, 67) only to keep sounding incomplete. This use of 'failure' helped me compose long passages of like material that could have structural substance.

In terms of orchestration and texture, the *calming down* sections are always based on the combination of clarinet and a string instrument. The string serves a triple purpose: to support and complement the clarinet line by sustaining key pitches while establishing the harmonic area around G3, to occasionally create friction with the clarinet's line through vertical semitones as in bars 60 and 63, and/or to remind the listener of the main marching rhythmic pattern. The harp appears with a very basic bisbigliando in bar 56, and provides supporting material to the clarinet and the string instrument. The selection of the G and F# pitches for the harp further underline the chosen harmony.



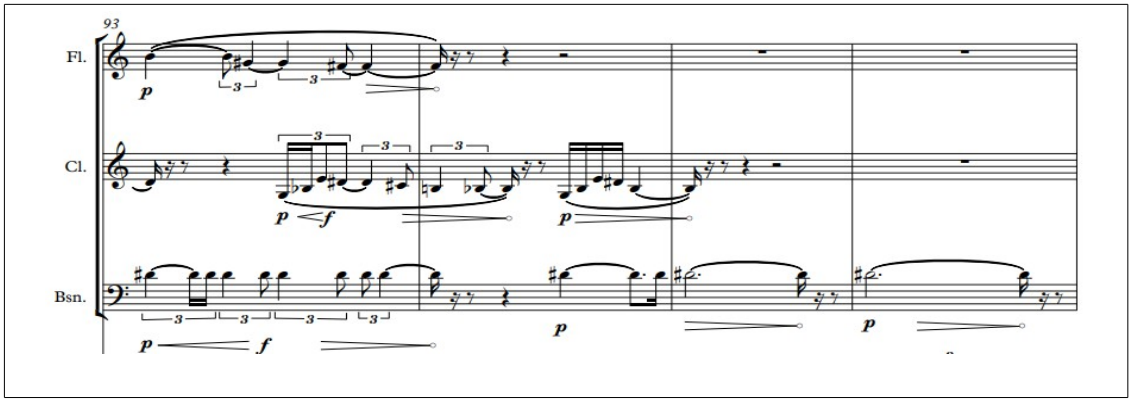
Ex. 28 – Lament, clarinet part, bars 56-58 (*Grieving*) (excerpt at sounding pitch)

In bar 73 the marimba and the flute appear with a different and structurally important line. This consists of a pitch-pattern of five descending notes within E major (B, G#, F#, E, D#). These two lines partly coexist through bars 81-84, but later, such as in bars 144-153, the descending line in the glockenspiel interferes with the clarinet (Example 29). Structurally, the lines' interference caused friction and pitch density that also contribute to the differentiation of the three *Calming down* sections, appearing briefly during the first appearance, thriving during the second, and appearing with less density during the third. My intention was both to create an interesting texture from juxtaposing two simple lines and to give the listener the impression of the struggle that can come with lament while also helping my narrative structure develop. The selection of marimba and glockenspiel was intended to resemble a toy box sound, connecting to childhood memories.



Ex. 29 – Clarinet and glockenspiel interference, bars 148-150 (*Grieving*) (excerpt at sounding pitch)

Lastly, it is necessary to mention the bassoon's role in these sections which is either to support the clarinet, or to connect the *calming down* section with the next *In shock* section of bars 95-97, as the pitch D# is central in this new section. (Example 30).

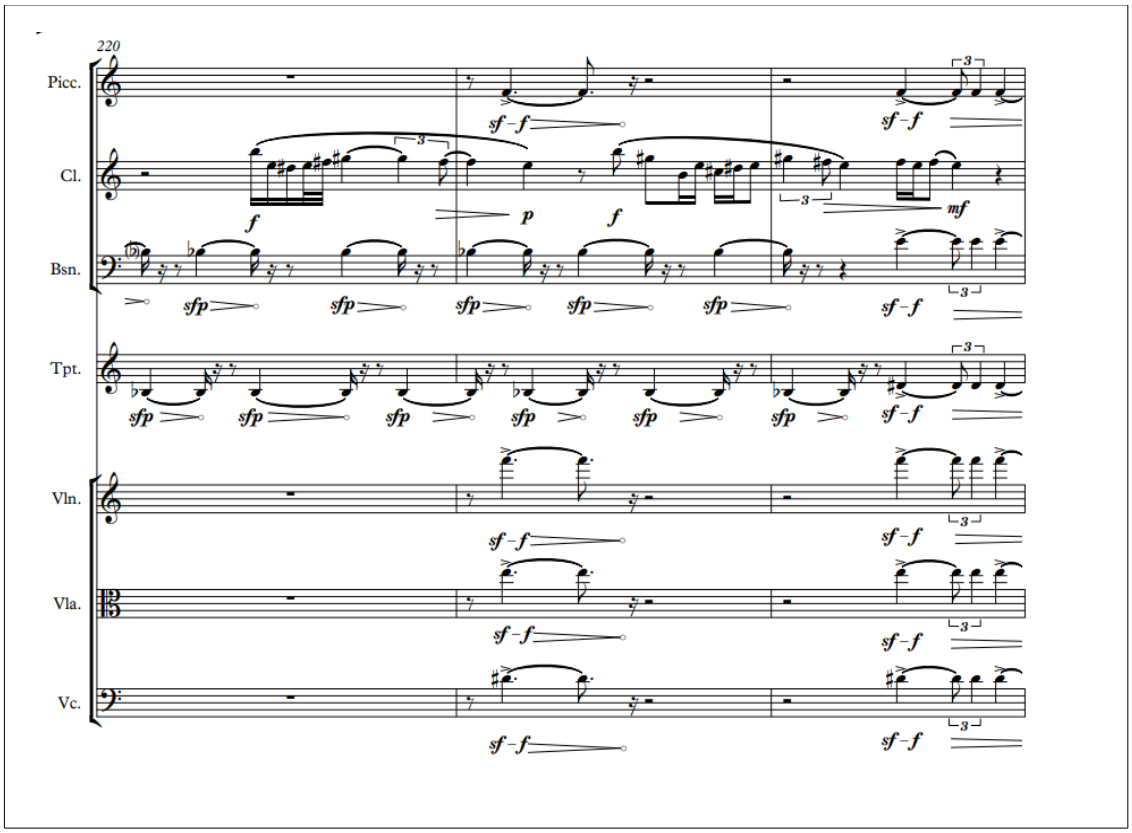


Ex. 30 – Bassoon on D#, bars 93-96 (*Grieving*) (excerpt at sounding pitch)

On the other hand, *Anger* is driven by a more vertical approach, with no clear melodic line. Similarly to *Calming down* it appears three times, each of which had to be differentiated and developed as the piece progressed. The more distinctive characteristics of *Anger* are the vertical semitones in the wind and string instruments, and the rhythmic interlocking between these groups. Harmony is static around D#-E-F, and the section progresses mainly through its rhythm. The whole section is a loud sound-mass.

As mentioned, rhythm and the applied rhythmic values were carefully planned for this piece, with this as a prime example. It is possible to see from the score that the entrance of the winds very rarely coincides with the entrance of the strings (for example bars 118-119). That was intended to create a sense of fluidity even within a blocky surface. Another rhythmic characteristic of this section is alternating sustained and shorter, quaver notes in *sf* dynamics, with the latter steadily taking precedence. This develops my aesthetic interest in displaying a musical idea before fragmenting it, as discussed regarding *Complexity* and *The in-between*. Fragmentation happens usually for an extended period before leading gradually into a new section.

Between bars 211-241 one can observe the blending of *Anger* and *Calming down*'s musical characteristics (Example 31). My intention was to juxtapose their horizontal and vertical approaches in order to arrive at a musical peak across bars 226-227 with a *fff* dynamic. The tension is gradually released and the augmented fourth reappears, now in the form of a diminished five (E-B♭ between the bassoon and the clarinet).

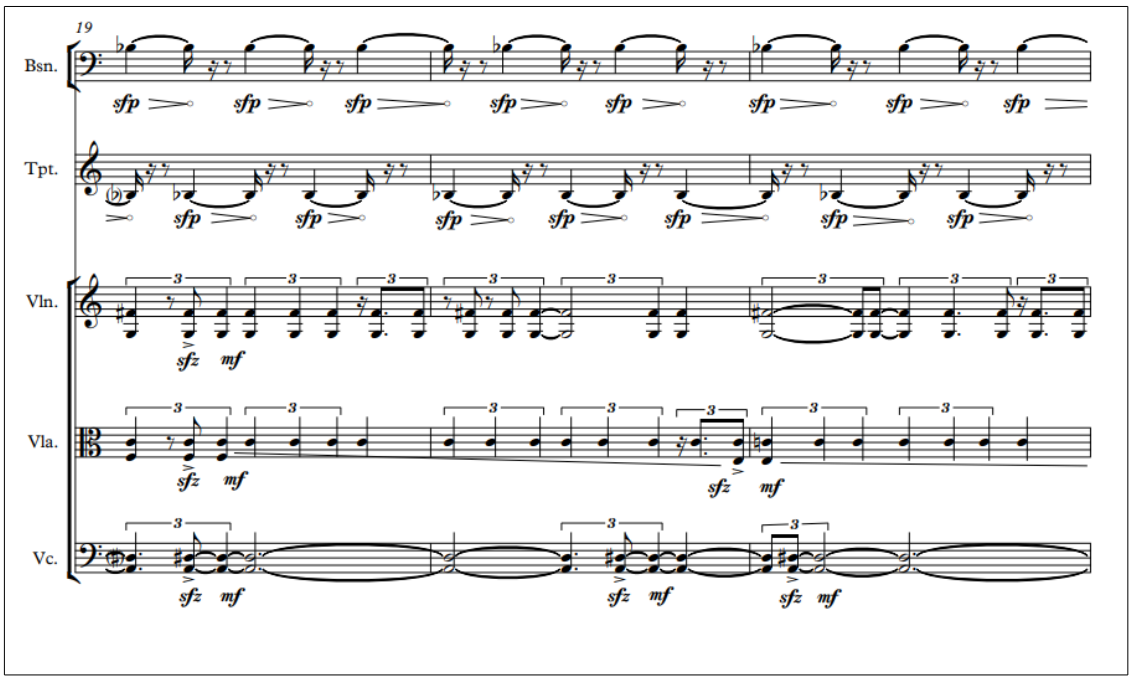


Ex. 31 – *Anger* and *Calming down*'s blending, bars 220-222 (*Grieving*) (excerpt at sounding pitch)

Echo in the head can be understood as the coexistence of stable and, intentionally, less stable musical elements and an overall sense of 'false' stability which gradually fades away. Its main musical characteristics are the augmented fourth inteval, the alternating B♭ between the bassoon and the trumpet, the steady pulsating rhythm and its juxtaposition with contrasting rhythms, and particularly high tempi (Example 32). As previously mentioned the augmented fourth has an important role in my work. The texture of this whole section is based on it, appearing both in a sustained form in the violoncello part, and on double and triple stops in the strings. I deliberately chose this interval due to its dissonant quality, and because, due to its symmetry, it does not imply any particular harmonic relationship on its own.

The pulsating B♭ has a double role: it enriches the texture and it provides the pulsating rhythm. Later it is contrasted with the triplets in the violin and viola. Harmony is mainly driven by the B♭ and A-D# harmonic areas. The active chromatic motion in the violin and viola parts comes as a contrasting element to this. The continuous G3 in the

violin part can be heard with the B♭ as a minor third, but these two notes rarely sound together. As a result, harmony is intentionally unclear, static in certain bars, and richer in others.

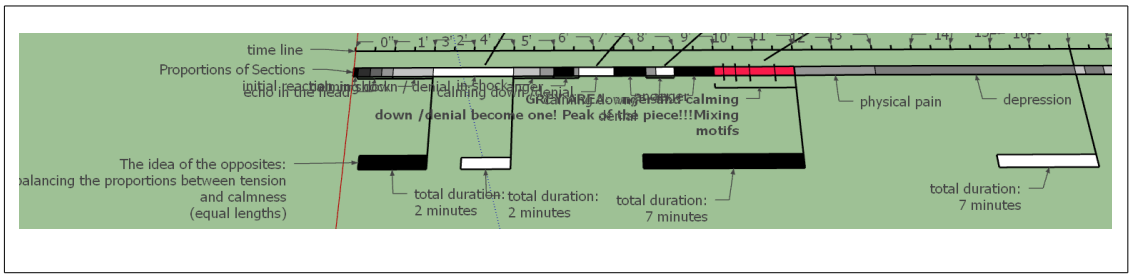


Ex. 32 – *Echo in the head,* bars 19-21 (*Grieving*) (excerpt at sounding pitch)

Lastly, *Depression* and *Acceptance* intentionally display the simplest ideas to balance the density of information in the previous sections. This contrast will be discussed later. Only the pitch B♭ is used and sustained through these movements, connecting these sections to the pulsating B♭ motif introduced during the *Echo in the head* section. Structurally speaking, I wanted to bring back this pattern as a musical memory and tie these two contrasting sections together creating a circle. Scelsi's monotonal approach and influence is here more apparent than in my other portfolio pieces. The sustained B♭ is enriched through alterations in register, instrumentation, and timbre. Due to its static pitch these two stages were also visualised in detail using SketchUp. The parameters mapped were instrumentation, timbre, and register. Decisions were based purely on the visualisations and how balanced those appeared.

4.2.5 Contrast

In my portfolio pieces, contrast has appeared in the form of differing movements, a repetitive and interfering element within other entities, and as changes and juxtapositions of extreme registers. In *Grieving* I applied this experience with the intention of using it to explore what I will refer to as 'tension/release of tension'. I also had to consider whether such contrasting ideas would appear in both macro and the micro structure. As explained in the Introduction, such decisions were part of my pre-compositional processes and they were organised in SketchUp using the colours white, black and gray for transitions between the two (Example 33). An important question I had to address while structuring the piece was what would define 'tense' and what viable options I had for its 'release'. My goal was to focus on their contrast. I knew I wanted variety in how these contrasting terms might be expressed and understood.



Ex. 33 – Contrast visualised in *Grieving*

One of the approaches I followed from tension to release included gradually removing instruments from the *Anger* section of pages 19-20 to reduce textural density, and rapidly changing dynamics, as in bars 124-125. Frictions created by dissonant intervals were also considered part of tension in the micro level, despite their appearance in quieter dynamics. In my view, dissonant intervals are the major and minor seconds, augmented fourths/diminished fifths, and major and minor sevenths. As explained in detail earlier, contrast can also be considered in the vertical versus horizontal harmonic approaches, or between simultaneous sustained and active rhythmic passages.

Finally, it is possible to see in the macro-structure that the piece is actually divided into two halves: the first half is overall the loudest and most musically complicated, accommodating rapid changes between contrasting sections and numerous variations of the same section. The second half, includes *depression* and *acceptance,* largely consists

of the sustained B♭. In my view this was the way to achieve overall balance, and that was also the main reason behind both halves being equally long in duration. The transition between these halves happens gradually through the *physical pain* interlude.

4.2.6 Reflecting on the experience and addressing the research questions

In this piece I pushed myself in a number of ways. It built on the exploration of harmony and texture, I had built in my other notated pieces. This time both harmony and texture were richer. However, this did not prevent harmonic stasis. It helped me realise that it is possible to engage with a greater variety of pitches while remaining faithful to my aesthetics.

Addressing the research question No.4, it is possible to say that having a clear plan over rhythm and over the density of the rhythmic values can alone support the chosen extra-musical narrative. At the same time, the pre-existing narrative can help organise compositional thought, and I do plan to explore similar approaches in future as well as exploring other mental health conditions through music using this approach.

Chapter 5 – Engaging with graphic notation

5.1 Research aims and goals

While I progressed through the PhD, I started considering how it would be possible to vary the three-dimensional representations of parameters to innovate form, as mentioned in research question 1b. This, alongside a developing interest in how I could relax or abandon my controlling nature in favour of performer freedoms resulted in the composition of the two pieces I discuss in this chapter. In addition, since I started visualising musical parameters in three dimensions, I got a lot of requests and questions regarding whether it would be possible to show these shapes, colours and plane/rectangular surfaces to the performers and the audience, and whether this three-dimensional, pre-compositional preparation could happen real-time on stage.

It is important to mention that I do not consider myself to be a graphic notation or an experimental composer. The main reason I engaged with these was to answer questions regarding the three-dimensional approach in purely instrumental music, and whether it could add anything to existing knowledge. Knowing that I would only touch this enormous area of experimental/graphic notation, I tried to remain very focused and loyal to my initial goals and research questions in order to tie these pieces with the rest of my traditionally notated portfolio. What is more, I first composed *a-mazed,* which intentionally represented the other 'side of the coin'. This experience informed my approach when I came to *Synesthesia.* In this chapter I will compare and contrast these two pieces to help the reader understand their musical and research connections.

5.2 α*-mazed* – graphic animated score for santoor and flute

5.2.1 Main inspiration and research context for *a-mazed*

α-mazed simulates a first-person video game environment in which the performers 'walk' through a virtual maze-like path, and improvise on their instrument according to instructions shown along the way. The piece is rooted in improvisation. The main inspiration behind this piece was Nina Whiteman's *House of Mazes* and *TOMB*. *House of Mazes* was presented by the composer on the 5th of October 2017 at the University

of Manchester. At that time I was a Master's student but the maze concept caught my attention. According to the composer one of her goals was to 'communicate to the audience the feeling of disorientation and lostness experienced by performers as they navigate the unusual notation'.[33]Whiteman herself hand-drew the score, which includes dead ends, tempo and duration indications, and other textual and traditionally notated instructions. In addition, each of the three performers has their own maze/score. The performers move freely in the maze unless instructions indicate otherwise. According to the composer's website, the lighting, camerawork and the general installation on stage are very important aspects of this work.

TOMB, on the other hand, 'places the performer in a disconcerting environment they may never leave'.[34]The work 'is an underground adventure, [...], a discovery of lost things, a place to become lost...'.[35]This particular quote led me again to the concept of memories, as explored in my narrative pieces. From my point of view, a dark corridor such as the entrance of an abandoned copper mine as used in the video for *TOMB* was the perfect place to stir memories. Later, I will discuss how I explored this in my own work.

Using shapes and colours as a replacement for traditional notation is not new, with notable examples from Stockhausen, Earle Brown, Morton Feldman, and Cornelius Cardew. Diving a little bit into the existing bibliography and reading about his piece, *Treatise,* I realised the considerable number of questions I had to answer. Virginia Anderson[36] underlines that *Treatise* was published 'with no performance instructions, thereby allowing it to be read as graphic art as well'.[37]The piece consists of various shapes such as triangles, circles, squares, etc. As a result, thoughts regarding the score as art versus score as instruction soon emerged.

In addition, I had to find my balance between what I was happy to control through instructions and notation, and what I was happy to totally leave to my performers. This

33 Description found in Nina Whiteman's official website (http://ninawhiteman.com/?p=88), posted by her on the 9th of December 2018, (accessed 29 June 2021)
34 Ibid.
35 Ibid.
36 Virginia Anderson, *"Well, It's a Vertebrate...": Performer Choice in Cardew's Treatise* (Journal of Musicological Research, 25: 3-4, 2006, 291-317)
37 Ibid. 292

automatically meant that I had to choose the performers wisely, and I also needed to determine whether my piece was suitable for anyone that could produce sounds, or if it was meant to be performed by experienced musicians. According to Michael Nyman[38] 'Cardew has always conceived of notation (in his own works) not as an end in itself or a means of unlocking sounds, but as a way of engaging the most valuable resource of any music – people'.[39] Cardew 'wrote that ideally such music should be played by a collection of musical innocents; but in a culture where musical education is so widespread […] such innocents are extremely hard to find'.[40] What is more, apart from choosing the performers, it was necessary to answer whether their first reaction to the fixed video/score would be more important than the following reactions.

Nyman writes that Cardew also 'wrote that in any notation a balance must be maintained between cogent explicitness (necessary to galvanize the player into action) and sufficient flexibility (in the symbols and the rules for their interpretation) to permit of evolution'.[41]This quote led me consider the structural evolution of *α-mazed*, as my goal was to create a connection with my other notated pieces.

5.2.2 Embracing cultural backgrounds

Similarly to Cardew's philosophy, I am also interested in people. More specifically, I take interest in personal stories and memories. I am also interested in trusting their experience and musical intuition. Harmony, texture, and pitch-group fragmentation are left in their hands, though I wanted to rely on experienced musicians. As a result, I turned to the Avazad Fusion Ensemble, a santoor-flute duo based in Manchester. This particular ensemble is experienced in improvisation and, also, both players are composers, and familiar with graphic notation. What is more, because of the performers' exploration of their Iranian and Jewish cultural backgrounds it was possible to connect more traditional modes and way of playing with a contemporary graphic score and more broadly with contemporary classical music.

38 Michael Nyman, *Experimental Music: Cage and Beyond, Music in the 20th century, Volume 9 in Music in the Twentieth Century* (Cambridge University Press, 1999)
39 Ibid. 115
40 Ibid. 117
41 Ibid. 115

Coming myself from Greece, and more broadly from the Balkans, means I have heard a great deal of Eastern European traditional music. However, as a classical pianist my experience of music making was always exclusively connected to the Western classical tradition. *α-mazed* was an attempt to connect and balance these musical worlds (East and West), by allowing the performers to incorporate their own musical backgrounds within or alongside given pitches. This form of improvisation is at its clearest when the players 'walk' through the two black corridors. For the first corridor the flute follows the santoor player, and for the second corridor the other way around. No musical guidance was given and these dark passages were used to direct the performers away from following a score and to be driven by memories or intuition instead.

In addition, it was possible for the santoor player to ‘draw’ the given shapes on her instrument, as it has a plane surface. That option gave interesting timbral results. Such ideas came to my mind after a presentation Einali gave at the University during my first year of research in 2018, in which several modes were presented, and a detailed demonstration was given of extended techniques.

There are already many important pieces to have included the cimbalom (an instrument similar to the santoor) in western music, including Stravinsky’s *Ragtime*, John Adams’ *The Gospel according to the other Mary*, and Gÿorgy Kurtág’s *Tre Pezzi for Clarinet and Cimbalon, Op.38a*. All of these pieces combine the cimbalon with western instruments and, therefore, incorporate it into western concepts regarding form and structure. I followed a similar approach but I took a more graphic and improvisatory approach.

5.2.3 The three dimensional architecture behind musical structure

It would not be possible to exclude from the research context Xenakis' contribution to architecture and music. Sven Sterken[42] gives an in-depth analysis regarding Xenakis' approaches, which I used as an inspiration but without focusing on the mathematical aspect of architecture, such as Xenakis’ use of the golden section in *Metastasis*.[43]

42 Sven Sterken, *Music as an Art of Space: Interactions between Music and Architecture in the Work of Iannis Xenakis* (Essays on the Intersection of Music and Architecture (Lulu.com, 2007)
43 Ibid. 29

Taking all these factors into consideration I finally chose my own path. Like in much of my portfolio I was interested in creating an evolving sectional form. In contrast with Whiteman's mazes, my video/score never pauses, and the performers never face a dead end or have the option to choose their path. The video moves from room 1, to room 2, to room 3, etc, until the maze's exit.

The proportion of each room/section and the walking speed were the parameters I could totally control, so the performers are restricted in how much time they spend in each room and on each shape. Alongside aesthetics, this was a key reason I decided to work with three dimensional video rather than following Whiteman's two-dimensional paper scores. The speeds used were:

*The performers walk in the virtual maze without stopping (middle speed)
*The performers stop to look around the walls (slow speed)
*The performers constantly change route (fast speed).

After a few discussions with my supervisor I decided not to move the players through the maze in real-time during the performance. My aim was to work on a fixed, linear score as I did with my other notated portfolio pieces. The performers were expected to take time in advance to rehearse as they would with a traditional score. Surprises or spontaneous reactions were not part of my vision, in contrast with *Synesthesia*. Regarding structure, I had to rely on the differentiation and contrast between rooms. In contrast with Cardew's approach, I was more interested in practicality than creating visual art. My research explores the impact of three dimensional shapes on form, so the material is defined through the maze's architecture in the following ways:

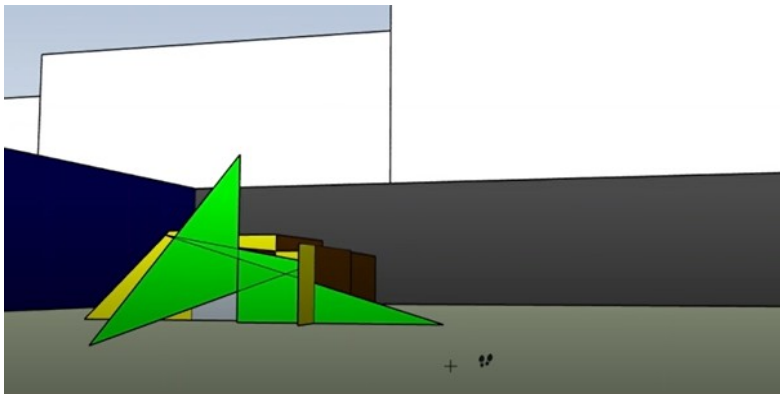
* Tall and short walls
* Walls with single colours versus walls with colours and shapes
* Dark corridors (Example 34)
* Undefined compact objects (Example 34)
* Play room, in which the performers can choose one of the 2 available options

The additional instruction I gave to them was that the lighter colour shades represented

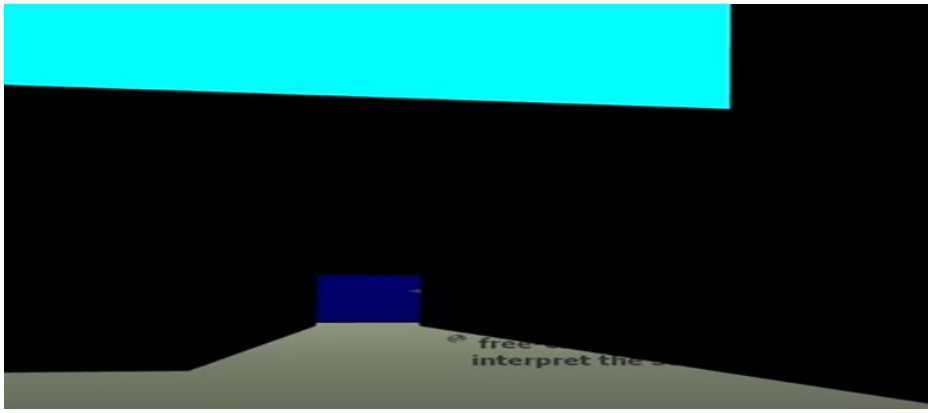
higher register, and the darker shades lower register. I also worked with the following shapes (Example 35), which we discussed in the first workshop. However, the performers were given the freedom to add their own interpretations:

* Concentric circles and their deconstructed version. These appear frequently and mark the main pitch-pattern: F-C#-E-D#, which I selected intuitively. I chose the circle as the main shape because it gives, in my view, a sense of wholeness. The deconstructed version appears mainly at the end of the piece, and it can be seen as a coda.
* Other geometric shapes, such as triangles and rectangles that the santoor player could 'draw' on the instrument's surface.
* Abstract-freehand shapes or lines to be used as a guide for a melodic line. The curves of these lines could also represent register, where no differentiations of colour shades were present.

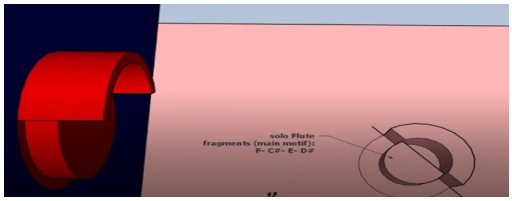
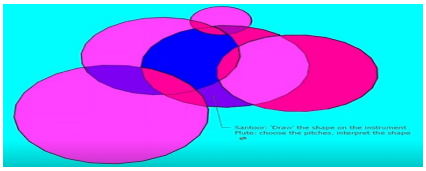
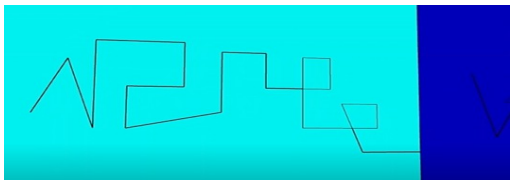
Undefined compact object



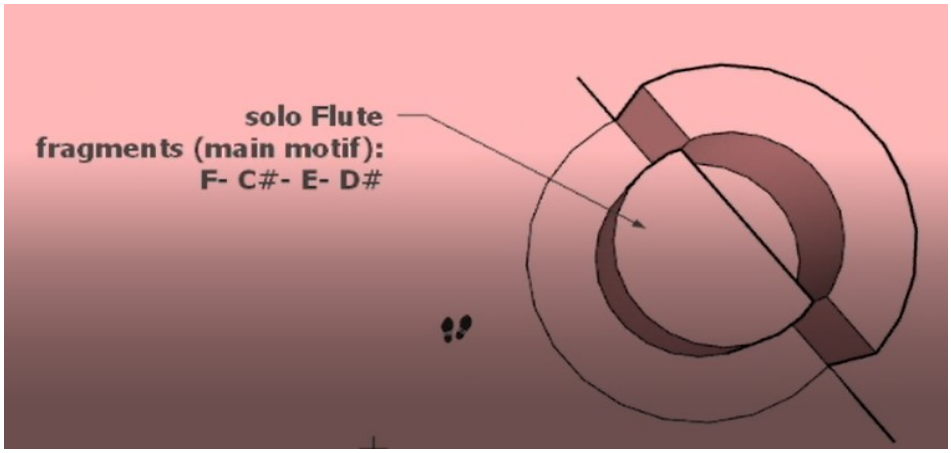
Dark corridor



Ex. 34 – Compact object and dark corridor used in *α-mazed*

Concentric circles (main shape)	Concentric circles (main shape-deconstructed version)
	
Geometric shapes	**Abstract-freehand shapes/lines**
	

Ex. 35 – Shapes used in *α-mazed*



Ex. 36 – Written instructions indicated by arrows in *α-mazed*

5.2.4 Reflecting on the experience

For *α-mazed* I encouraged the performers to follow my instructions given with arrows in the video. I still treated this piece the same way I treated my other traditionally-notated scores, although I knew that I would not be able to precisely define pitch patterns, harmony, texture or their development and connection. Accordingly, my feelings on the piece will be inherently different after each performance.

One of the most useful pieces of feedback I received was that my recording does not match the pitches shown with arrows in the video score, and other questions regarding how I felt about that, and whether the final result pleased me. I can say that through workshopping and rehearsals myself and the performers had a clear and, ultimately, fixed idea of the final outcome which would be pleasing to all of us. It was disappointing that the performers did not use, in the concert, the notes provided, and thus did not deliver the intended modality. Recording and documenting experimental music has been an area of ongoing discussion through the years. Nyman writes that: 'recordings of the most open processes are also misleading. Both Cage and Cardew have drawn attention to this. Taking of a composition which is inderteminate of its performance, Cage says that a recording of such work 'has no more value than a postcard; it provides a knowledge of something that happened, whereas the action was a non-knowledge of something that had not yet happened".[44]

In conclusion, I consider this piece to be a hybrid between Cardew's approach and Whiteman's score concept, although my own approaches engage traditionally skilled players and simulated environments, and permit the players fewer freedoms. Connecting indeterminancy with architecture, and other fixed pre-determined events and layouts can best describe my goal. What is more, developing musical form through contrast, without necessarily labeling or prioritising the contrasting components was another achievement of *α-mazed,* and this development happened through directed improvisation. This exploration of experimental approaches to my research interests continued with *Synesthesia*.

44 Michael Nyman, *Experimental Music: Cage and Beyond, Music in the 20th century, Volume 9 in Music in the Twentieth Century* (Cambridge University Press, 1999), 10

5.3 *Synesthesia* – Violin, Trumpet, Saxophone and visual artist

5.3.1 General description

This project was performed on the 12th of March 2020 at the University of Manchester by the Vonnegut Collective with the visual artist Laura Orton. The moment I knew that I would be doing this project and working with such talented improvisers, I started thinking about how I could build on my experience with *α-mazed*. This time my vision was to explore three-dimensional visualisation in real-time on-stage. This also had the potential to connect my experimental works with the traditionally notated elements of my portfolio, especially through musical structure.

As mentioned in the programme note, the main event is that a sculptor with synesthesia, a neuropsychological trait in which the stimulation of one sense causes the automatic experience of another sense, tries to enrich a white sculpture with fabric of different colours and textures. They make the decisions by hearing how each colour and fabric texture 'sounds'. Each musician has a colour assigned to them: violin - red, trumpet - blue, and saxophone - yellow. The musicians follow the artist's gestures and improvise around pitch patterns and textures which I had determined for them. The piece consists of two main sections with an interlude. During the first section, the artist explores the sound and musical patterns of each material. Solos, duos, and trios are formed based on how many colours are held in their hands. The artist also has two black paper balls, which instigate the interlude when picked up. In the interlude, the three musicians freely improvise themselves loud, chaotic patterns. From this point, the piece progresses to the second section where the artist attaches and arranges the fabric pieces on a white tulle sculpture. The musicians then use the colourful sculpture as a graphic score and play it simultaneously from end to end.

Ex. 37 – White tulle fabric used in *Synesthesia*

Ex. 38 – Fabric material and black paper balls used in *Synesthesia*

5.3.2 Research context and influences

The biggest influence that led me to experiment with theatrical principles in music was Jani Christou's (1926-1970) work, *Strychnine Lady* (1967), for a female solo viola player, five actors, two groups of strings, brass, percussion and piano, tape, a sheet-metal construction, other sound-producing objects, a red cloth, and a conductor. The score consists of both graphic and traditional notation, as well as written instructions. This influenced the way I presented my own score and range of objects.

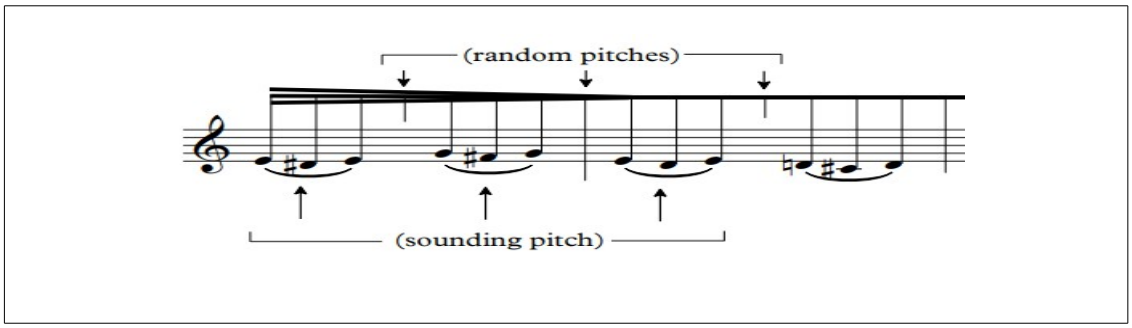
Of course, there are plenty of other composers who have engaged with experimental music theatre. Prime examples are Cage's *Water Walk*, and Maxwell Davies' *Eight Songs for a Mad King*. Cage said that *Water Walk* had a direct connection with his other work, *Water Music*[45]. In his own words: 'the *Water Music* wishes to be a piece of music, but to introduce visual elements in such way that it can be experienced as theatre. That is, it moves towards theatre from music.[…]I simply put[…]things that not only would produce sounds but that would produce actions that were interesting to see'.[46]This statement was a source of inspiration for the performers' actions on stage in *Synesthesia*.

Regarding Maxwell Davies' piece, Nikki Cesare writes: 'as in opera, the music in [*Eight Songs for a Mad King*] becomes as much a part of the drama as the text, but because […] the musicians play an integral part in the performance, their bodies also become a part of the production […]'.[47] This statement led me think how to use the artist's theatrical gestures and body posture to further support my piece.

In *Synesthesia* there is the absence of the human voice in any form, in contrast with Maxwell Davies' approach. My aim was to focus exclusively on the instrumental interpretation of a built, colourful structure and answer questions regarding real-time mapping in three dimensions. What is more, the order of events was arranged in

45 John Cage, Michael Kirby and Richard Schechner, *An Interview with John Cage* (The Tulane Drama Review Vol.10, No.2 (Winter 1965), 50-72), 60 (https://doi.org/10.2307/1125231) (accessed 27 June 2022)
46 Ibid.
47 T.Nikki Cesare, *"Like a Chained Man's Bruise": The Mediated Body in "Eight Songs for a Mad King" and "Anatomy Theater"* (Theatre Journal, Vol.58, No.3 (October 2006), 437-457), 440 (https://www.jstor.org/stable/25069870) (accessed 27 June 2022)

advance, allowing little space for the indeterminacy of Cage. However, within these events the artist is free to choose from the given options. In addition, the musicians explore various timbral qualities on their instruments but were also provided with fixed patterns (Example 39).



Ex. 39 – Saxophone part, *Synesthesia*

Attending the workshops and working on the drafts led to practical questions that needed to be addressed. To begin with, it was necessary to clarify who would be the 'composer' and who the 'creator/conductor'. Secondly, there needed to be a distinction between the 'visualisation-score' (white tulle fabric) and the traditionally notated score which included all other instructions. In addition, it was necessary to decide which parameters I would control, and which I would leave to the performers' discretion, and to consider how such decisions would differentiate this piece from *α-mazed*. Connecting the project with my three-dimensional method discussed in chapter 2 was another challenge as this piece is not engaged with SketchUp.

5.3.3 Comparisons with the other portfolio pieces

In order to define the roles of all parties involved, I started by declaring that the 'composer' is myself. My role was to organise the order of events and their approximate duration, establish the roles of the artist and the musicians, decide how each musical parameter will be visualised, and compose the patterns for guided improvisation. All these, along with additional instructions and a timeline of events form the 'composition-score'. The 'composition-score' resembles a traditionally notated score including staves and standard notation. The 'creator/conductor' is the visual artist who coordinates the performance through their spontaneous decisions within the time frame the 'composer' has decided for each section. As soon as the artist decides the speed and material they will use, they become part of the compositional process, therefore they

are also a creator as well as a conductor. The 'visualisation-score' is the fabric sculpture created in real-time on-stage. It is different each time the piece is performed, and is used by the musicians as a linear graphic score within the overall 'composition-score'.

Ex. 40 – Visualisation-score in *Synesthesia*

According to all these, *Synesthesia* immediately sets itself apart from *α-mazed* as the performers cannot rehearse as they would do otherwise, and this automatically meant that they had to be very present in the moment during performance. Unlike in *α-mazed*, the element of surprise and spontaneous reactions were important parts of *Synesthesia*'s identity. In the workshops, the musicians admitted that following a score while also following the artist's movements at all times without knowing what she might do next was quite challenging for them. Accordingly, they proposed the plan to learn all the given material by heart and to perform without the 'composition- score'.

Another difference from *α-mazed* is the way I treated pitched material, harmony, and texture, as these were all the parameters I wanted to partly control. It is possible to state that, unlike *α-mazed*, *Synesthesia* embraces in a greater sense harmonic stasis due to the potentially large number of reappearances of material. A difference from my traditionally notated pieces is that the performers also improvise, though they have been instructed to remain faithful to the given patterns. Deciding texture for their individual patterns needed careful thought and, in my approach, it is usually inseperably connected to register. Texture was also influenced by the combinations the artist created by holding colours on their hands.

5.3.4 SketchUp equivalents and differences

As explained in detail in chapter 2, in SketchUp the three available axes (x,y,z) usually represent three different musical parameters, with my most common combination being instrumentation-register-time. In a performance of *Synesthesia*, the x axis, in this instance instrumentation, does not exist, as the instrumentation is based on the chosen colours. The y and z axes exist as usual, represented by the height and breadth of the tulle sculpture. However, unlike my other pieces the shape of the fabric matches the contour of the musician's patterns making it a parameter that influenced texture. For example, the 'tail' pattern in the violin part is represented by long, curly, red ribbons tied together. At the same time the music consists of glissandi and wavy gestures. .

5.3.5 Reflecting on the overall experience and addressing the research question

Overall, both *Synesthesia* and *α-mazed* were enjoyable projects which forced me to explore paths out of my comfort zone. While addressing research question 1b, I realised that shapes and colours allow a great sense of control while enabling choices made by other participants. The parameters of a shape can play a double role as either a composer's tool, defining parameters, or a stimulus for improvisation. Form, therefore, takes on a new identity as musical parameters are prioritised away from the traditional concepts.

Chapter 6 – Conclusion

At the beginning of this research, my priority was to understand the impact of three-dimensional visualisation on my music, while meticulously pursuing this method. Throughout this PhD I had the opportunity to experiment with various visualisations, work on different score formats, discuss my ideas with other composers, and collaborate with exceptional ensembles and performers. All of these allowed me to reconsider some of my approaches to music making, with the most important lesson being to trust my intuition and creativity more. Balancing creative decisions with consistency to a pre-organised macro-structure needs careful consideration, and that such phenomena should not be treated as 'black-and-white' is an important lesson to have learned. Trusting performers' intuition, experience, and musicality is also something I will definitely keep with me going forward.

In this research project, I mostly focused on the possibilities that SketchUp can provide through the creation of virtual colourful shapes. This three-dimensional video imaging is an original method within instrumental music. In this research it was connected to constantly moving music through limited pitch material, and static harmony within dramatic narratives and a continuous focus on contrast. All these connections could lead to a considerable contribution to the existing knowledge. Differentiation of sections is important to this work, in contrast with Xenakis' use of sound-masses. Of course, there could be further applications including more advanced graphics, created by other, similar softwares, and also connecting visualisations to trigger points so that either performers or audience could alter the piece by altering the visual. This would create a different dynamic between composer, performer, and audience, changing their perception and expectations while still remaining firmly under the scope of instrumental music compared with Saariaho's mixed approach.

Mental health and other programmatic elements provided a purpose and shaped my vision to express thoughts and emotions. Three-dimensional visualisations offer a secure guide and practical framework for exploring these experiences through music, helping determine, for example, which instruments play where and for how long. In the near future I plan to work more with mental health as a stimulus for composition, as

my compositional goal is to communicate emotions. In particular, I plan to work on a large-scale work which will musically express my experiences of conditions such as anxiety, loneliness, and panic attack episodes. My three-dimensional approach provides a visual guide, allowing me to simultaneously see the big picture of the overall musical structure, as well as all the compositional decisions I might take regarding individual bars.

Lastly, I would be interested to explore whether three-dimensional visualisation could have potential as an educational tool, especially in introducing younger music students to contemporary music. Such a project could possibly work by starting from my own pieces and visualisations and steadily moving to music by other contemporary composers, using visualisation as an analytical tool.

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Appendix: Scores Studied (indicative list)

Within the curves (string quartet)

Abrahamsen, Hans	String Quartet No. 4 (2012)
Glass, Philip	String Quartet No.5 (1991)
Haas, Georg Friedrich	Violin Concerto No.1 (1987) String Quartet No. 2 (1998) String Quartet No. 5 (2007)
Ligeti, György	String Quartet No.2 (1968)
Scelsi, Giacinto	String Quartet No.5 (1984) String Trio (1958)
Schnittke, Alfred	String Quartet No.3 (1983)
Shostakovich, Dmitri	String Quartet No.8 (1960)

Complexity (solo A clarinet)

Badalov, Sergey	Martyrs for clarinet solo (2010)
Berio, Luciano	Lied per clarinetto solo (1983)
Birtwistle, Harrison	Melencolia I (1976)
Corigliano, John	Clarinet Concerto (1977)
Gorb, Adam	Agen for clarinet solo (2010)
Lachenmann, Helmut	Dalniente (1970)
Malone, Kevin	the last memory (1996/2013)
Saariaho, Kaija	Laconisme de l' aile (1982) DUFT (2012)
Stanley, Jane	Firefly Reflection (2019)
Stravinsky, Igor	Three Pieces for Clarinet (1919)
Widmann, Jorg	Fantasie (2006)

The in between (piano solo)

Adès, Thomas	Three Mazurkas for Piano, Op.27 (2009), Concert Paraphrase on Powder Her Face (2009)
Alexiou, Haris	To Tango tis Nefelis (1996)
Benjamin, George	Shadowlines (2001)
Berio, Luciano	Six Encores for Piano (1990)
Corigliano, John	Fantasia on an Ostinato for Piano (1985)
Knussen, Oliver	Sonya's Lullaby for Piano, Op.16 (1977-1978)
McKennitt, Loreena	Tango to Evora (1991)
Reich, Steve	Piano Phase (piano duo) (1967)
Saariaho, Kaija	Prelude for Piano (2007) Ballade for solo piano (2005)
Saunders, Rebecca	Choler (piano duo) (2004) Shadow (solo piano) (2013)
Scelsi, Giacinto	Piano Sonata No.3 (1939)
Takemitsu, Toru	Quotation of a Dream – Say sea, take me! (1991)
Vine, Carl	The Anne Landa Preludes (2006)
Xenakis, Iannis	evryali (piano solo) (1973)

Grieving (chamber ensemble)

Adams, John	On the transmigration of souls (2004)
Ashton, Kim B.	Berceuse (2010)
Bennett, Ed	Psychedelia (2016)
Berio, Luciano	Sequenza II (1963)
Bliss, Arthur	Morning heroes (1930)
Chopin, Frédéric	Piano Sonata No.2, Op.35 (1837/1839)
Corigliano, John	Symphony No.1 (1988-89)
Elgar, Edward	For the Fallen (1917)
Howells, Herbert	Elegy for Viola (1917)
Lang, David	Little Match Girl Passion (2008)
Magle, Frederik	The Hope (2001)
Malone, Kevin	the last memory (1996/2013) Opus Opera (2012)
Peate, Robert	Pearl I (2012), Pearl II (2013), Pearl III Epitaph (2015)
Penderecki, Krzysztof	Threnody to the Victims of Hiroshima (1960)
Pook, Jocelyn	Mental Health Trilogy -Hysteria-A Song Cycle for Singer and Psychiatrist (2018) -Hearing Voices (full orchestra, 2012), Hearing Voices (chamber, 2015) -Anxiety Fanfare and Variations for Voices (2014)
Scelsi, Giacinto	Quattro Pezzi (1959)
Vaughan Williams, Ralph	The Lark Ascending (1920) Symphony no. 4 (1934) Symphony no. 6 (1947)

α-mazed (graphic animated piece for santoor and flute)

Adams, John	The Gospel according to the other Mary (2012)
Cardew, Cornelius	Treatise (1963-67)
Hope, Cat	Wall Drawing (2014)
Kim-Boyle, David	point studies no.2 (2013)
Stravinsky, Igor	Ragtime (1918)
Whiteman, Nina	House of Mazes (2017) TOMB (2018)

Synesthesia (violin, saxophone, trumpet and a visual artist)

Cage, John	HPSCHD (1969) Water Walk (1959)
Christou, Jani	Strychnine Lady (1967)
Dench, Chris	Piano Sonata (2015-16) Funk (1988-89)
Ives, Charles	The Unanswered Question (1908)
Maxwell Davies, Peter	Eight Songs for a Mad King (1969)
Molitor, Claudia	it's not quite how I remember it (2009)
Smith, Wadada Leo	Luminus axis (2002)
Stockhausen, Karlheinz	Gruppen (1957)

Other influential scores

Abrahamsen, Hans	Schnee (2006-08)
Adams, John	Shaker Loops (1978) Century rolls (1997)
Corigliano, John	Symphony No.2 (2000)
Crumb, George	Black Angels (1970) *Vox Balaenae* (1971)
Feldman, Morton	Rothko Chapel (1971)
Franck, César	Prélude, Fugue et Variation, Op.18 (1860-62)
Richter, Max	Sleep II (2015) Recomposed by Max Richter: Vivaldi – The Four Seasons (2012)
Saariaho, Kaija	Laterna Magica (2008) Im Traume (1980)
Shaw, Caroline	Partita for 8 Voices (composed 2009-2012)
Tavener, John	The Lord's Prayer (1999)
Wolfe, Julia	Anthracite Fields (2014)
Xenakis, Iannis	Metastasis (1953-54)