Korean Heritage as a Foundation for Composition

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A portfolio of compositions and commentary submitted to the University of Huddersfield in partial fulfilment of the requirements for the degree of Doctor of Philosophy (PhD)

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Abstract

This dissertation provides the conceptual and aesthetic background of the compositions composed throughout the course of my doctoral studies. I will introduce Korean philosophies and aesthetics and then expand upon these elements to demonstrate how they have influenced my approach to music composition. Furthermore, I will demonstrate how I intertwine the use of colour and Korean philosophies. Chapter 1 delineates the elements of Korean philosophies and aesthetics that have influenced my musical language. The chapter focuses on how the Korean handcraft art *Jogakbo* and the Korean philosophies of *Yin-Yang, Ohang* and *Meak* are related to each other. Additionally, I examine the origin and structure of *Jogakbo*, with a particular focus upon the key variables of shape and colour. The examination of *Jogakbo* causes me to establish how form and structure are linked in *Jogakbo*, and then how I apply this form and structure to my composition. Furthermore, I will describe how the aesthetics of *Yin-yang, Ohang* and *Jogakbo* form the core of my musical language by examining the function and unplanned approach to the different coloured scraps of material in *Jogakbo*. Drawing upon this examination, I describe how I have taken the colours from these scraps to form the colours in my music. In relation to this, I investigate the musical techniques of spectral composers, with an emphasis on musical colour, looking at specific composers' techniques and establishing how they have influenced my own compositional techniques. Finally, I will discuss the role of the philosophy of *Maek* generating linearity on the horizontal structure of music. Chapter 2 discusses individual portfolio pieces composed throughout the doctoral course chronologically. I will demonstrate how selected Korean philosophies, aesthetics, and the techniques of *Jogakbo* have gradually evolved to play a larger role in the composition of my pieces. In particular, the colours used in *Jogakbo* and the philosophy of *Ohang* play a more direct role in creating the structure and form of the pieces composed in late

course. In the conclusion, the research throughout my doctoral course has been summarised, and limitations and other challenges reached while applying the research to my compositional process are examined. Finally, the conclusion ends with a discussion of potential directions to further this research.

Introduction

In April 2009, Korean composer Chan-Hae Lee and Israeli composer Dan Yuhas, his wife, and I visited the Korean traditional Royal Palace *ChangDeokGoong*. While we were walking around the palace, the beauty of the landscape mesmerized us. Dan Yuhas noted that Korean architecture went well with nature. In particular, he and his wife expressed their appreciation for the decoration of the roof of the palace, impressed with how the decorations consisted of various shapes and colours. The shapes of the decorations were composed of geometric patterns: triangles, quadrangles, and circles; and of images from nature: the sun, the moon, and the clouds; and of flower patterns: roses and lotus. Additionally, the decoration was composed of a variety of different colours. When we looked at the decoration on the roof, the same pattern appeared to repeat itself over the course of the palace, however upon closer examination we noted subtle differences in the colours and shapes and carefully prepared transitions through these colours and shapes. Chan-Hae Lee explained the complexities within the decorations by comparing them to a leaf. “Although the colour of the leaf is regarded as green, each leaf contains slightly different shades of green: pale green, yellow green and olive. And like the leaf, Korean architecture is painted using a multitude of different colours and shades, however, some colours may share similar properties with regards to colour.” Chan-Hae Lee continued to explain that “to the untrained eye these properties may look similar, but for those that spend more time and look beyond the surface level, there lies the rich beauty of Korea.” (Yuhas and Lee personal communication. 1 April 2009)

After the conversation with Dan Yuhas and Chan-Hae Lee, I reflected upon my compositional process and found myself considering the following line of questions: What is colour? What is colour in music? If I apply colour to music, can I express the multitude of different shades and colours in my music and by extension express these colours through the use of specific roles for each colour? On a more

personal level I also posed the question: What constitutes the beauty of Korea, specifically the art and the process behind the formation of its art? This questioning sparked further thought on how I, as a Korean composer, might draw from the beauty of Korea for the purposes of composition. However this also led me to consider whether the beauty of Korea is already reflected in my music, considering that my cultural background is a part of me. To perceive and comprehend the beauty of Korea, I researched the heritage of Korea such as the Korean art form of *Jogakbo* and the Korean philosophies of *Yin-Yang, Ohang, and Maek*, and through this research, I discovered a potential process for their application in my composition.

1. The Beauty of Korea

1.1. Background

My interest and research into the functions of colours from a musical perspective began during my postgraduate studies at Yonsei University in South Korea. At that time, I was focused on the relationship between colours and musical timbres as well as how musical timbres can express colours. I studied the work of Helmut Lachenmann (1974), in particular, his solo clarinet piece *Dal niente(Interieur III)*, which enabled me to understand the notion of colour when it is generated by instrumental techniques. The piece introduces a relationship between instrumental technique and form, where each section features a primary instrumental technique and explores its own unique sound. For example, the first section of the piece features the combination of key noise sounds and standard clarinet pitches. The key noise sounds are transitioned into "toneless sounds of blowing with prescribed fingerings" (Lachenmann, 1974, performance instructions), which then in turn, form the basis of the second section. This timbre-based form of the piece encouraged me to research additional musical forms related to timbre for the purposes of developing my own musical language.

During the early stages of my doctoral studies, I focused on developing my understanding of how to compose with musical timbres through researching the music of Tristan Murail and Gérard Grisey, who both focused on investigating musical timbre and the "physical properties of sound". Additionally, their approach to musical form derives from the transformation of sounds and sections. Finding this different concept for organising sections to be interesting, I decided that adding the concept of transformation-based form to my current process of timbre-based sections warranted further research.

It was around this time that I became interested in the Korean traditional handcraft art *Jogakbo*. This art form is created from worn-out scraps of different colours and shapes, and features sequences of scraps showing the inter-change of colour from one shade to another. Although there are many different types of *Jogakbo*, ranging from multi-coloured to multi-shaped, for me, the most fascinating are the ones that present slightly different shades of colours to portray a rich array of colour spectrums. To elaborate, the real beauty lies not in the use of a multitude of different colours but in the use of slightly different shades of colours such as olive green, dark green, bright green, pale green to express a different dynamic and a rich texture. Through the different shades of colours of the scraps, I could feel a connection between the *Jogakbo* and my interpretation of the beauty of Korea. This, to me, is reminiscent of the intricate decoration on the roof of the Royal palace (see p.10) in Korea where the use of different shades of material helped create the decoration.

The subtle use of different shades amongst the scraps inspired me to use greater subtlety and nuance within my musical language. Furthermore, I could detect a similarity between the sequence of the scraps of *Jogakbo* and Murail and Grisey's musical form in relation to their use of colour change. For instance, the scraps have their own identity with colour and shape, and these scraps are connected to each other without any development. Correspondingly, an aspect of the form of Murail and Grisey's music is that their music is composed of several sections where each section has its own sound, and the sections are connected without development from a previous section to the next. The similarities between the sequence of the scraps found in *Jogakbo* and the sequence of the sections used in the musical form of Murail and Grisey fascinated me and this became a foundation for me to experiment further along these lines.

1.2. *Jogakbo* and Korean philosophies: *Yin-Yang*, *Ohang* and *Maek*

Jogakbo is a handcraft art that originated during the Joseon Dynasty (1392-1910) in part as a means to collect remnants of cloth and find a practical use for them. The ordering of colours and patterns of the recycled scraps while crafting *Jogakbo* is based upon the principle of *Yin-Yang* and *Ohang*, which is that the basic colours being used are perceived to feature qualities that are combined to form sequences of increasing and decreasing energies. What at first appears to be the free-form combination of irregular scraps from cast-off materials is actually the creation of art featuring a large-scale harmony derived from increasing and decreasing energies through the connection between meaningful colour schemes and formal patterning.

Figure 1 'Jogakbo'

(2012)

The colours of scraps are based upon the philosophy of *Ohang*, a philosophy that details the relationship between the five different elements that compose the universe: water, fire, wood, metal, and earth; the five directions and the two colour groups in the philosophy of *Ohang*; known as *O-Jung Saek* and *O-Gan Saek*. *O-Jung Saek* consists of five active and positive colours: black, white, blue, red, and yellow. These five colours are regarded as the colours that created the universe. On the

other hand, there are five passive and negative colours, which are called *O-Gan Saek*. *Gan* means 'between', so *O-Gan Saek* consists of colours referred to as being between the positive colours due to the fact that they are generated through the combination of colours from *O-Jung Saek*. Specifically, the colour green is generated by combination of blue and yellow while the colour pink is generated by the combination of white and red, the colour purple by red and black, the colour sky by white and blue and the colour sulfurous yellow by yellow and black. In this manner, *O-Gan Saek* is a combination of two different positive colours including green, pink, purple, sky, and sulfurous yellow. The combination of *O-Jung Saek* and *O-Gan Saek* is called *O-Bang Saek*. (Lee, 1997, p.76, cited in Kim and Lee, 2011, pp.117-118)

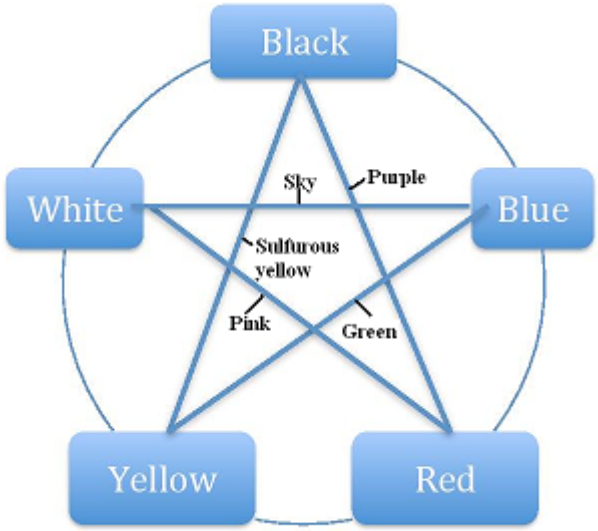


Figure 2 "*O-Bang Saek*: *O-Jung Saek and O-Gan Saek*"
(Han, 1987, pp.144-145 cited in Kim and Lee, 2011, p.118)

The scraps featuring these active and passive colours are sequenced throughout *Jogakbo* allowing for the transition of colours from positive to negative or from negative to positive to be perceived. The sequence also allows for the perception of increasing and decreasing energies, and these invisible increasing and

decreasing energies, which flow in *Jogakbo,* create not only a balance between the scraps but also a large-scale harmony. The invisible energy used in *Jogakbo* is understood as *Maek* in Korean philosophy.

Before discussing how the shapes of the scraps of *Jogakbo* relate to the philosophy of *Yin-Yang*, allow me to first briefly discuss *Yin* and *Yang.* The characters *Yin*(陰) and *Yang*(陽) are related to darkness and lightness respectively. For example, the pictogram for *Yin* is created by the combination of the pictograms for the words hill(丘) and cloud (雲). This pictogram represents a cloud existing above a hill and bringing about a shade that generates darkness. On the other hand, the pictogram for *Yang*(陽) is created by the combination of the pictograms for the words hill(丘) and Sun (昜). This pictogram represents a sun existing above a hill and brings about a light that creates brightness. René Guénon in his book *The Great Triad* further elaborates that *Yin* is "passive, negative or feminine" and that *Yang* is "active, positive or masculine"(2001, p.26). In this regard, *Yin* signifies negative and decreasing energy and *Yang* stands for positive and increasing energy.

As already stated, the patterns of the scraps of *Jogakbo* are based on the *Yin-Yang* philosophy. For instance, the scraps are composed of the shapes of circles, triangles, and rectangles. The circle is considered to be Heaven and the rectangle is regarded as the Earth in Korean philosophy. To continue, the circle corresponds to *Yang* generating an increase in the level of energy and the rectangle corresponds to *Yin* generating a decrease in the level of energy. In addition, the triangle is described as a human, connecting and controlling the force of the Heaven and the Earth. Furthermore, the triangle regulates the circle as well as the rectangle*'s* increasing and decreasing energy.

The philosophies of *Yin-Yang* and *Ohang* fascinated me, as I realised that the principles of these philosophies may be applied to the composition of music. For example, each musical parameter and instrumental technique may contain its own

colouration such as light, dark, shimmery, warm, cold, soft, and harsh. These colours are comparable with the colours of *Jogakbo*. In addition, when the parameters are combined or connected to each other, relative colourful qualities may be realised, for example one parameter may be lighter or darker than the next. These relative qualities of musical parameters allow for the perception of increasing and decreasing energies. In this regard, I realised there is a parallel to the philosophy of *Yin-Yang* between musical parameters.

I pursued applying the character of *Jogakbo* as well as the philosophies of *Yin-Yang, Ohang* and *Maek* to my musical language. First, in relation to the opposing principals of *Yin-Yang* I explored the opposite components found in musical materials and the role these components may play in music. Additionally, the philosophy of *Yin-Yang* is further referenced to compose transitions of timbre from one sound to another sound between set musical parameters. For example, the transition of timbre can show the transformation from light to dark or from dark to light. Second, I related the qualities of the colours of *Jogakbo* to the musical colours in my music, while further investigating common properties between visual colour and musical colour. Additionally, in order to explore my own musical structure and form, I applied the sequence of the different colours and shapes of the scraps in *Jogakbo*, to my musical structure and form. Finally, I employed the philosophy of *Maek* to explore the linear flow of sound in the horizontal structure.

1.3. Musical language in a general sense

The section 'Musical language in a general sense', will describe the integration of the character of *Jogakbo* as well as the integration of the philosophies of *Yin-Yang*, *Ohang* and *Maek* into the musical language of my compositions. This integration is seen throughout my compositional process both on a local level, through the use of pitch, and on a global level with regards to musical structure and

form. To begin with, the first chapter 'Pitch Organisation', will discuss the treatment of pitch material and my research of spectral composers, with the intention of applying aspects of their spectral compositional process to my *Yin-Yang* and *Ohang* based compositional process. Next, the second chapter 'Musical Colour', will display how the colours and shapes of the scraps found in *Jogakbo* are translated into my musical language and connected with musical structure and form. In this chapter, I especially focus on the common vocabulary between visual colour and musical colour. The third chapter 'The philosophy of Maek', will discuss how my compositional approach developed with a desire to integrate the law of *Maek* with regards to the flow of invisible energy being applied to the flow of sound. I will be referring to specific pieces within my portfolio to further explain this integration of the aforementioned concepts into my compositional process.

1.3.1. Pitch Organisation

My approach to pitch is influenced by the work of spectral composers focused mainly on the music of Gérard Grisey and Tristan Murail. Spectral composers concentrate on studying musical timbre and the "physical qualities of sound". Furthermore, they also explore the transformation and the transition of the properties of sound over time (Rose, 1996, pp.7-8). Among the research areas of spectral composers, the most promising area for me is the research of the harmonic spectrum. The reason is that the practical and instrumental harmonic spectrum is composed of imperfect components that generate slightly distorted sounds. Theoretically, the mathematical law of frequency explains the harmonic spectrum. Joshua Fineberg states: "It is defined by an integer relation between a fundamental frequency and the other components of a sound" (2000a, pp.85-86). However, Fineberg points out the other property of the harmonic spectrum, which is "inharmonicity" of the practical or instrumental harmonic spectrum:

> Western instruments have been developed for the most part, to have spectra which are very close to pure harmonic spectra, so as to

> emphasize clarity of sound and pitch. However, because of the physical system of sound production that they use, the sounds are never completely harmonic. (Fineberg, 2000a, pp.86-87)

Fineberg's opinion about the harmonic spectrum states that the realistic harmonic spectrum is not theoretical and is made up of irregular partials, which are generated by a "physical system of sound production", and thus the partials are non-tempered or slightly distorted. Tristan Murail describes a similar view with regards to the imperfection of instruments' harmonic spectra and specifically the distorted nature of the harmonic spectrum in the piano, in his article 'Spectra and Sprites'.

> In reality, the piano spectrum is not perfectly harmonic. It contains a slight distortion, which stretches the highest frequencies. This allows us to move smoothly and naturally into the inharmonic domain, for which we have many instrumental models. (Murail, 2005a, p.142)

This idea of inharmonicity analysed by Murail (2005a, p.142) can also be related to the bell sound, as the bell spectrum includes the minor third over the fundamental note, and thus this spectrum contains the minor third and the major third partials simultaneously. This combination of minor third and major third partials demonstrates that the actual sounding bell spectrum does not conform to the theoretically understood harmonic spectrum.

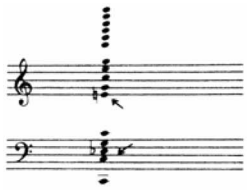


Figure 3 "A typical bell spectrum"

(Murail, 2005a, p.142)

I was fascinated by harmonic spectra composed of irregular and distorted components, as even though the pitch might be the same, the harmonic spectrum of the pitch is slightly different depending on the instrument. Thus, the shades in the

tone of the same pitches differ slightly based upon the different instruments producing the tone. Furthermore, even when the same pitch is generated in the same instrument, the shades in the tone may be different depending on the fundamental note. In addition, when the same pitches generated on different fundamental pitches are placed next each other, a change of timbre is produced as the pitches are played. Furthermore, if the same pitches are played simultaneously, a relative colour in the tone will be generated through the combination of the pitches. One pitch might be lighter and clearer, and the other pitch might be darker and more vague. As the philosophy of *Yin-Yang* revolves greatly around the balance between lightness and darkness, the capacity for pitches to reflect this lightness or darkness based on their fundamentals allowed for an even greater integration of the philosophy into my compositional process. In this process, the lighter and clearer pitch would generate a more increasing and expanding energy while the darker and more vague pitch would generate a more decreasing and contracting energy. I was greatly interested in the individual tone colour of pitch in different harmonic spectrum and the relative tone colour between the pitches. I attempted to explore this different tone colours between the same pitches in *The Colour of Light* for string quartet.

In the first section of *The Colour of Light* for string quartet, I explored the different tone colours and relative tone qualities of the same natural harmonic pitches, when the two elements are combined simultaneously.

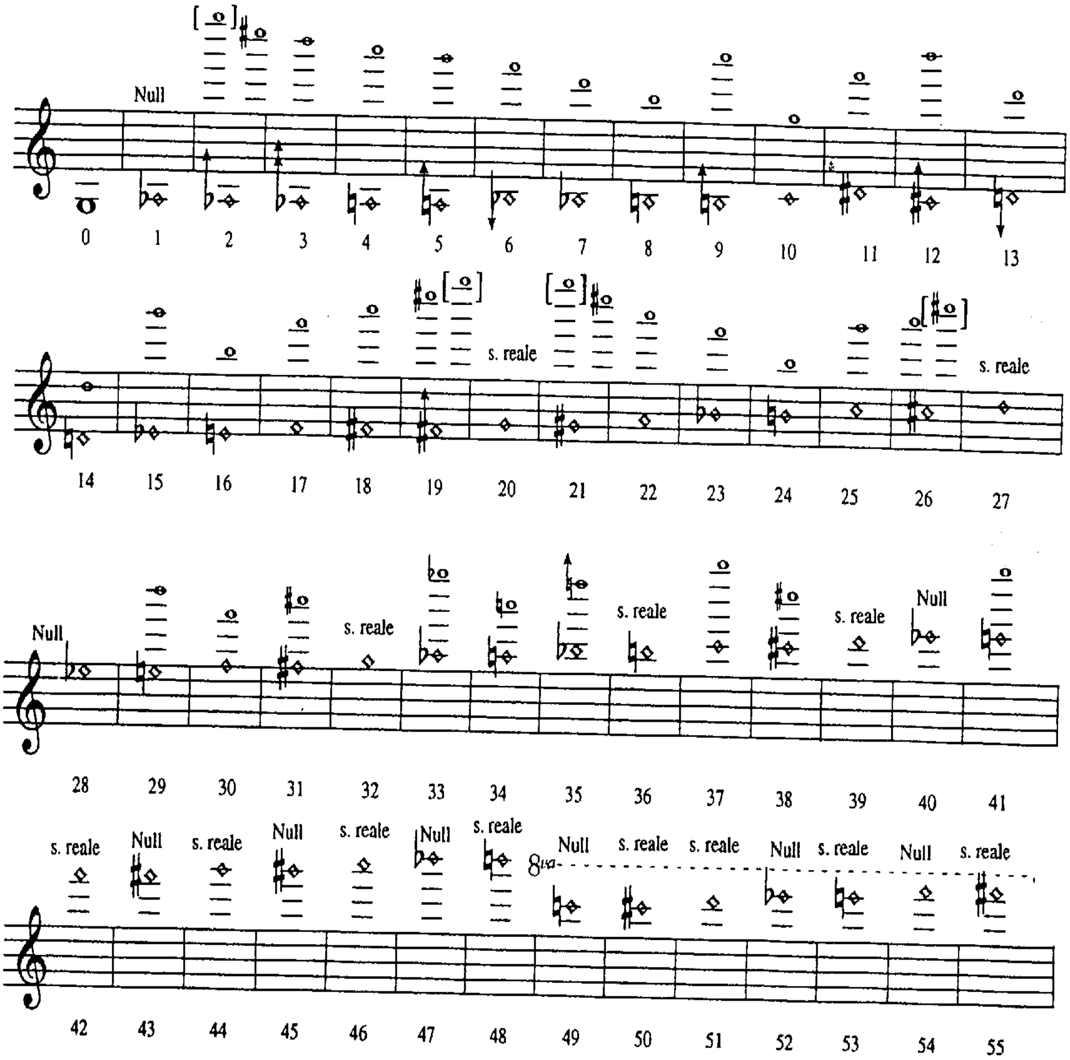


Figure 4 “Microtonal natural harmonics”

(Strange and Strange, 2001, p.118)

Figure 4 shows the natural harmonics on the G string on the violin. Following this principle, I made a table of natural harmonics on each of the strings on the violin.

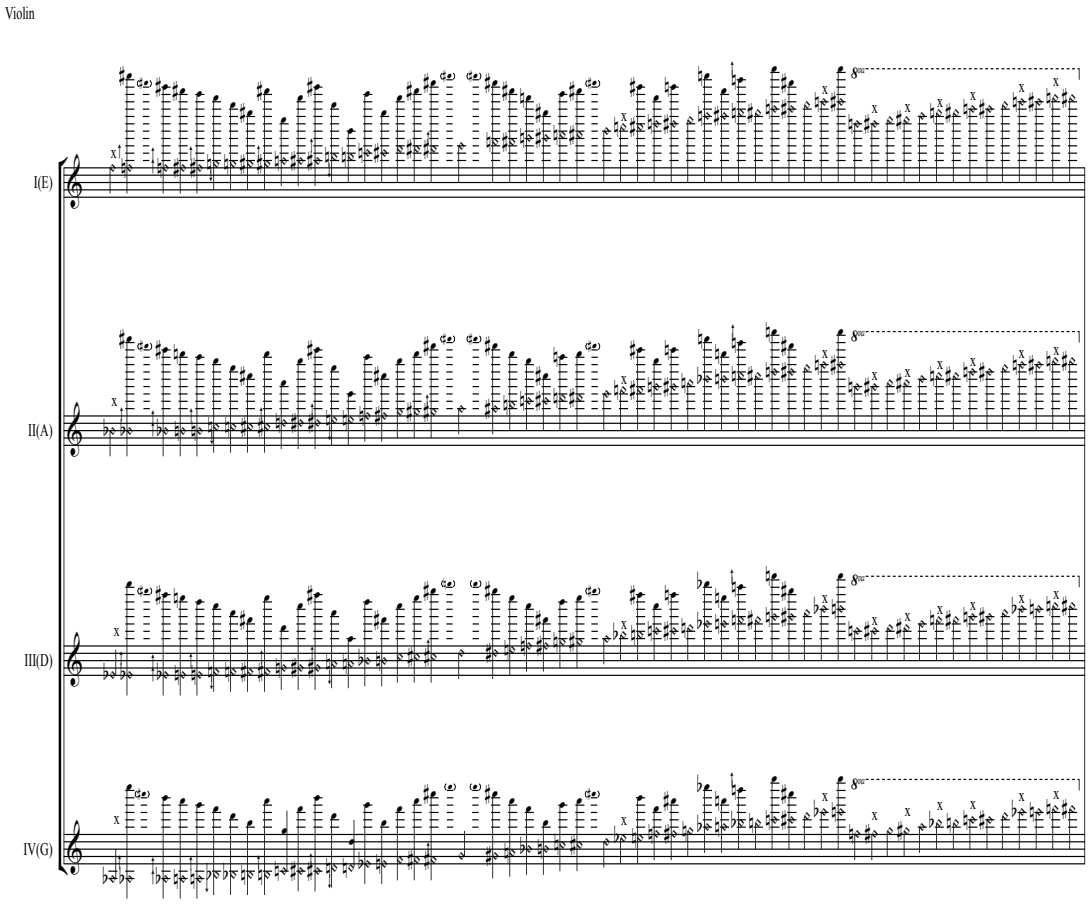


Figure 5 Microtonal natural harmonics table in Violin

In Figure 5, the bottom (diamond) note is the finger position and top note is the sounding pitch. As we can see, there are different natural harmonics from the sounding pitch E6 on the first and second strings in violin and these different natural harmonics of the sounding pitch E6 are employed in bar 1-4 of *The Colour of Light*. Although the natural harmonics create the same sounding pitch E6, their tone colours are subtly different. In order to explore this changeable tone quality, I employed natural harmonics on the second and first string in violins I and II respectively. In addition, the natural harmonics generated on the pitch E5 are used in the viola and on the pitch E6 in the cello.

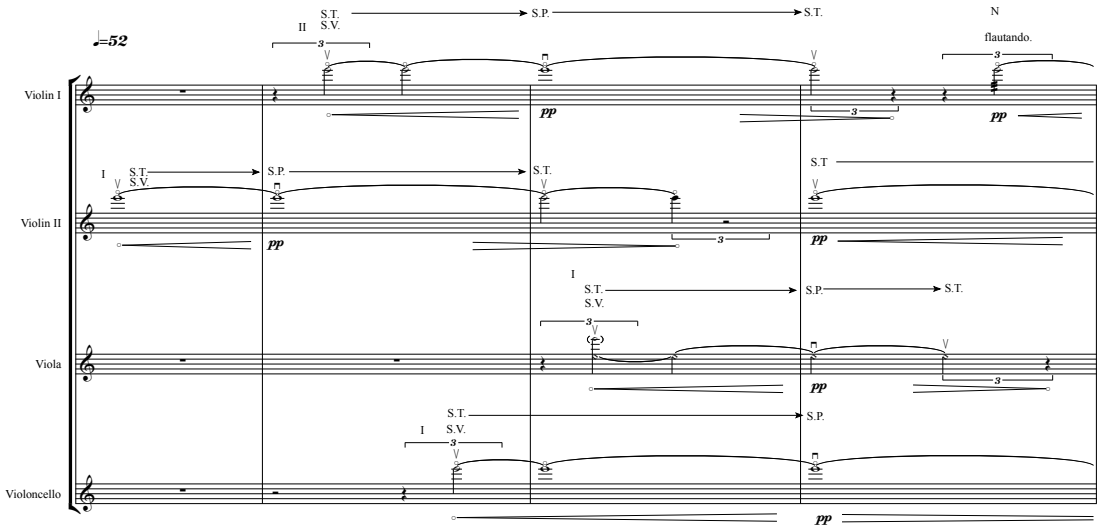


Figure 6 The first section in *The Colour of Light*

These four natural harmonics generate the same sounding pitch E6, however, I created slightly different sounds from the pitches. For example, the harmonic pitch E of violin II is clearer and lighter than the one of Viola, because the harmonic of Violin II is created on a real note, so the player can discover the pitch easily and make the sound clearly. However, the harmonic in the viola is generated from a pitch that is one octave lower than the sounding pitch. In this regard, there exist subtle differences of timbre between the natural harmonic sounds. Additionally, I integrated the idea of the increasing and decreasing energies of the philosophy of *Yin-Yang* in this section. When these different harmonic sounds are mixed together, some pitches might generate an increasing and explosive energy while other pitches might create a decreasing and contracting energy. To demonstrate this idea, I added bowing techniques and bowing positions to the pitches. For example, the part for violin I in bar 3 features the pitch E at the position of *sul ponticello* with a down bow, while the part for violin II features the same pitch at the position of *sul tasto* with an up bow. For this reason, the sound from the part of the violin I is capable of being louder and generating more increasing energy than the sound from the part of violin II, whereas the part of violin II can sound quieter and produce decreasing energy. Accordingly,

there exist contrasting qualities of timbre and forces between pitches. These subtle differences of timbre can be seen in violin II and I from bar 18 to 22. I used the same sequences of sounding pitches, B5, F#6, B6, F#6 and B5 but the pitches are generated by different harmonics techniques such as “less standard harmonics” and “standard harmonics” techniques in violin II and I respectively. (see figure.7) In this manner, the sounding pitches can be slightly different between violin II and I.

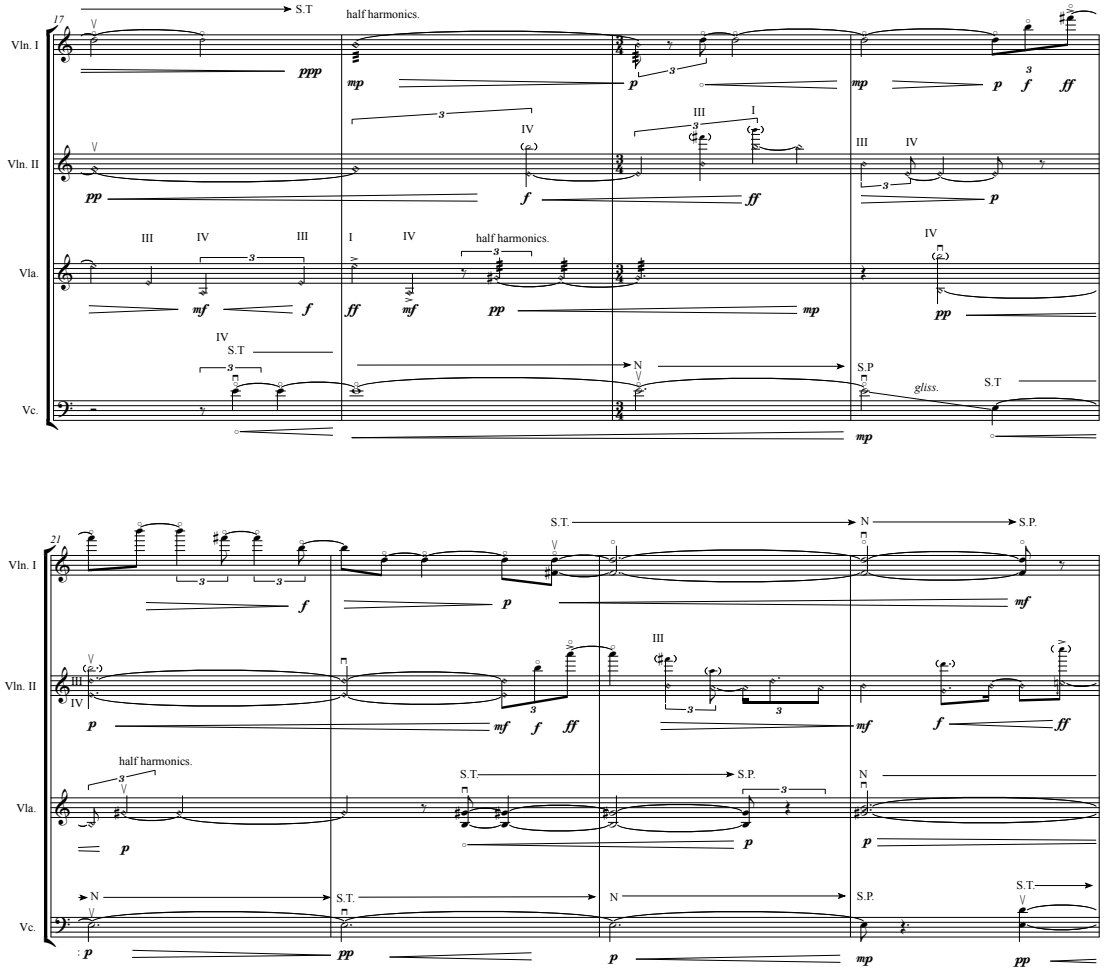


Figure 7 The different harmonics techniques in bar 17-24

The exploration of the qualities of timbre and opposite energies between pitches is also carried out in the solo piano piece *The Scent in the Wind*. My fundamental idea for this piece was to compare the different qualities of timbre of sounds: clear or nebulous, focused or unfocused, etc. I took inspiration from certain

elements explored by Caspar Johannes Walter (2010) in his work *Interferenzen*. His work includes various sounds, such as multiphonics, harmonics, unprepared pitches, and pizzicato, which are generated on a single piano string. Four performers produce these sounds with multiple rhythmic patterns, such as triplets, quintuplets and septuplets, resulting in the formation of complex textures and layers in the sounds. Additionally, the performers change the pressed positions on the strings and generate the transition of the sounds such as from multiphonic to harmonic sound. I was interested in the combination of these various sounds and attempted to apply these sounding materials to my compositional strategy. First, I chose the lowest pitches C, Db and D as central pitches of the composition *The Scent in the Wind* and experimented with the multiphonic sounds generated by these pitches.

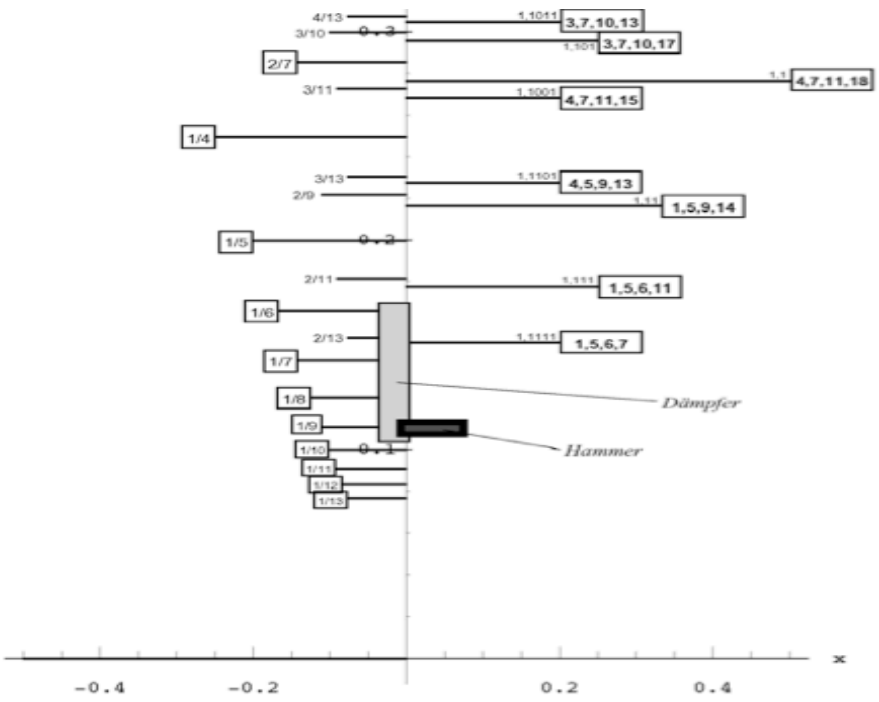


Figure 8 “Orte von Flageolettes und Flageolettmehrklängen auf der vorderen Hälfte einer Klavier-Basssaite”

(Walter, n.d.)

Figure 8 is a diagram by Caspar Johannes Walter to show the positions generating mutiphonic sounds on a single piano string. If materials such as blue-tack and clips are placed on a position a little lower than position 3/11 on the piano string as specified by the diagram, partials [4,7,11,15] of the fundamental note are created. Also, if those materials are placed on a position lower than position 2/9, then partials [1,5,9,14] are produced. In line with this principle, I created partials [4,7,11,15] on the pitch C, [1,5,9,14] on the pitch Db and [4,5,9,13] on the pitch D by preparing the piano with blue-tack and clips and used these as principle multiphonic sounds in this piece.

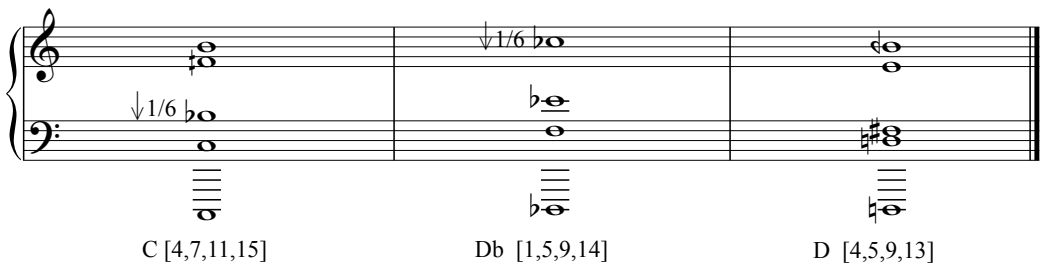


Figure 9 Multiphonic sounds on the lowest pitches C, Db, and D

In the first section of *The Scent in the Wind*, two multiphonic sounds based on the pitches C and Db are featured. First, in order to emphasise the timbre of each multiphonic sound, the multiphonic sounds are repeated in bar 1-2. For example, the multiphonic sound generated on the pitch C is repeated in bar 1 and the other multiphonic sound produced on the pitch Db is repeated in bar 2. After the repetition of each multiphonic sound, the two sounds are combined in bar 3. This combination of the sounds creates a new quality of sound different from each individual sound's quality, thus sounding transition is generated between bar 2 and bar 3. After the playing of the multiphonic sounds, the unprepared high pitches of C and D are added based on the combination of multiphonic sounds in bar 6. In this way there exist opposite timbral sounds between multiphonic and unprepared pitches, because

multiphonic sounds might generate a darker, fainter, less focused and more rounded sound than the unprepared pitches, which are a lighter, clearer, focused and more penetrating. According to this phenomenon, multiphonic sounds generate more decreasing and passive energy while unprepared pitch sounds produce more increasing and active energy. In this manner, the combination of multiphonic sounds and unprepared pitch creates differences of timbre and different energies between sounds.

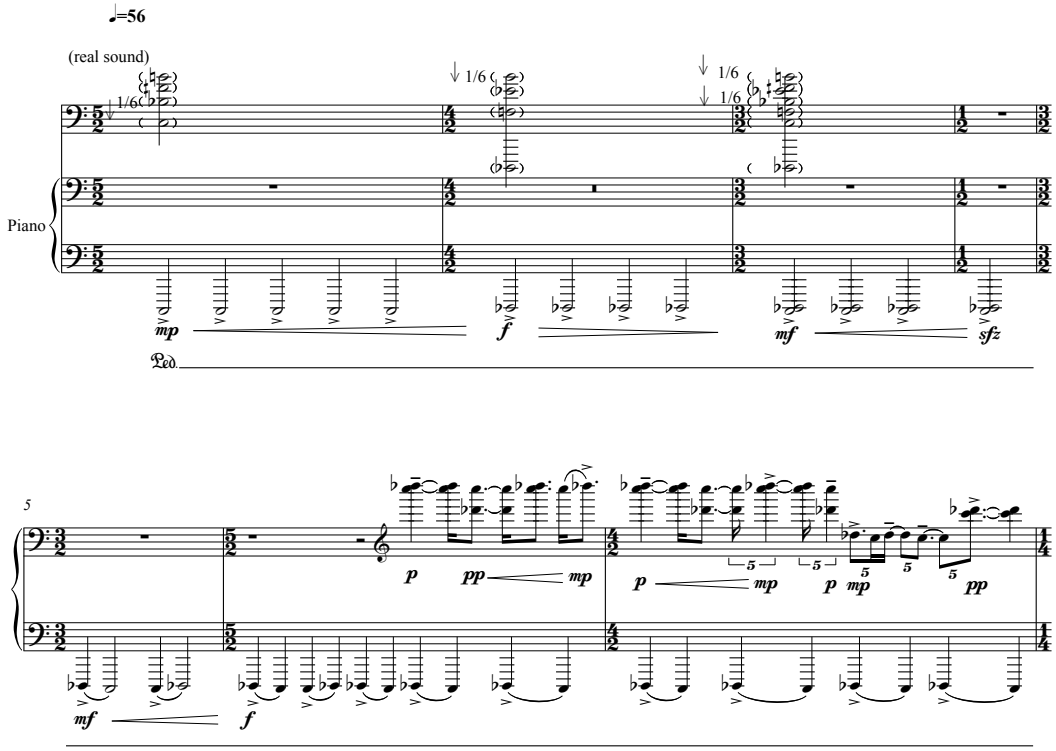


Figure 10 The first section in *The Scent in the Wind*

As discussed previously, the opposite qualities of colour between pitches and sound can be linked to the philosophy of *Yin-Yang*, which contains opposite qualities such as lightness and darkness. These colourful effects of musical materials are also related to the philosophy of *Ohang* and the character of *Jogakbo*. I will discuss these colourful effects in more detail in the following chapter.

1.3.2. Musical Colour

My other interest is in the sequence of the scraps of *Jogakbo.* While each

scrap has a different pattern and colour, when the scraps are connected, a new colour spectrum is generated. Furthermore, balanced harmony is created between the scraps by a combination of positive and negative energy from the colours. I was fascinated by the unusual colour spectrum, as in some *Jogakbo* the colour spectrum is changed from one colour to another colour slowly, while in other *Jogakbo* the colour spectrum alternates the colours dramatically between scraps. Accordingly, there exist many different types of colour spectrums in *Jogakbo* and this variety of array of colours provides *Jogakbo* with delicate and complex textures. I wondered if there could be a way to apply the colour spectrum to my musical structure and form? If so, how could I associate the colour spectrum of *Jogakbo* with musical structure and form? Moreover, what is the common vocabulary of visual colour and musical colour? In order to comprehend the correlation between visual colour and musical colour, I started to examine the perspectives of other composers on this correlation.

1.3.2.1. Visual Colour and Musical Colour

A variety of composers have investigated colour in relation to sound. In this example, the Russian composer Alexander Scriabin matched scales with colours by his synesthesia. Scriabin recognised the scales C, D and F# as the colours red, yellow, and blue respectively (Sabaneev, 1929, p.273 cited in Peacock, 1985, p.496). The other scales' colours are presumed by the order of the colour spectrum, which is the nearest relationship between the colours and the scales associated with the ascending circle of fifths (Peacock, 1985, pp.496-497). For example, in the circle of fifths, the scale G comes after the scale C, which is associated with the colour red, and before the scale D, which is associated with the colour yellow, resulting in the scale G being associated with the colour orange. However, Scriabin's colour system is different from that of the Russian composer Nikolai Rimsky-Korsakov. Figure 11 shows both Scriabin and Rimsky-Korsakov's view of each major key.

Key	Alexander Scriabin	Rimsky-Korsakov
B major	Mid-blue/pearl	Dark blue
Bb major	Dull deep pink	Darkish
A major	Green	Rose/pink
Ab major	Lilac/light violet	Grey/violet
G major	Orange	Brown/gold
F# major	Bright blue/violet	Grey/green
F major	Deep red	Green
E major	Sky blue	Sapphire blue
Eb major	Crimson	Grey/blue
D major	Yellow/golden	Golden/yellow
Db majors	Intense violet/purple	Dusky
C major	Intense red	White

Figure 11 "Scriabin and Rimsky-Korsakov: mappings of musical keys to colour"

(Adkin and Dickens, 2012, p.8)

As we can see from the table, Scriabin and Rimsky-Korsakov have different opinions regarding the colour of each scale suggesting that the reaction to colour and sound may differ depending on the perception of each individual composer. Because of the subjective discrepancies between sound and the perceived colours, I decided to research another unifying factor: the psychological effects of colour and sound. To examine the psychological effect of visual colour and sound, I investigated the research of scholars on colour. Korean Scholar Nury Im and Inyoung Oh state about colour:

> Colour might stimulate or cause people to feel peaceful, excited, and pacified. Additionally, colour transfers hot or cold, and sorrowful or joyful feelings to people. Also, colour may cause people to feel passion or to raise their mental strength. In addition, colour provides the opposite psychological effect, such as closeness and farness, masculinity and femininity, lightness and darkness, strength and weakness, and good and bad. In this regard, if colour is understood, a new dimension is opened in our perceptional system. (Im and Oh, 2010, p.22)

Im and Oh state that colour has the power to change people's emotion and psychology as people may feel differently in response to visual colour and so in this regard, visual colour has an impact on people's perception and psychological attributes. This comprehension of the psychological function of visual colour led me to the questions: is it possible to perceive the change of the psychological effect of

musical colour in music? How can colour be defined in music? Furthermore, what is the psychological effect of sound in relationship to visual colour? To examine these questions, I proceeded to research Georg Friedrich Haas's approach to visual colour and sound, as he is also interested in the psychological effect of visual colour.

Georg Friedrich Haas (2006) utilises light as a musical parameter in *Hyperion,* his concerto for light and orchestra, in order to explore the musicians' perceptions of sounds combined with different visual colours. Haas states the function of the light in the introduction to *Hyperion*:

> Changing colours alter the perception of sounds. Temporally organised light functions like a silent percussion part... four orchestral groups are placed around the four walls of the room. A different light source is placed in front of each of them, clearly visible to the players. The musicians react to the light, in the same way that they react to the visual signals of a conductor. What this visual element actually looks like depends on the free decisions of the person responsible for the lighting. The score only prescribes when something has to happen. And it is necessary that these events should be clear enough for the performers to be able to perceive them. Sudden changes provide demarcation points in the stream of sound. (Georg Friedrich Haas, 2006)

Haas explores whether the appearance of visual colour can have an impact on a performer's perception expecting that the appearance of the different coloured lights would create a division in the flow of sound. Haas's approach to visual colour shared with me a new perspective on the function of visual colour in music with regards to the psychological and spiritual response. This psychological effect of visual colour allowed me to connect the interaction between visual colour and musical colour since both feature a psychological function.

Russian painter and art theorist Wassily Wassilyevich Kandinsky discusses the psychological effect of each visual colour descriptively in his book *Concerning the spiritual in Art*. In 1911, Kandinsky states that yellow is "warmth", blue is "cold", green is expressed as "restful colour", and light warm red as giving "a feeling of strength, vigour, determination, triumph" (2010). Furthermore, Kandinsky describes the painter's palette in two processes; one being the physical and optical interpretation of colour. He states:

> In the first place one receives a PURELY PHYSICAL IMPRESSION, one of pleasure and contentment at the varied and beautiful colours. The eye is either warmed or else soothed and cooled. (2010, p.42)

The other one is a “psychic effect” of colour:

> But to a more sensitive soul the effect of colours is deeper and intensely moving. And so we come to the second main result of looking at colours: THEIR PSYCHIC EFFECT. They produce a corresponding spiritual vibration, and it is only as a step towards this spiritual vibration that the elementary physical impression is of importance. (2010, pp.42-43)

I was interested in Kandinsky's two different phases of understanding colour, because there are similarities with the perception of sound. For example, first, people can understand sound physically with their ears such as loudness and quietness or fastness and slowness. Second, sound can be interpreted as a psychological phenomenon or sensation such as warmness or coldness and happiness or sadness. This psychological effect of sound inspired me to investigate the psychological effect of sound and how to relate this to the visual colours of the scraps of *Jogakbo*.

1.3.2.2. Sound colour

There are a variety of terms to explain musical colour, such as musical timbre, tone colour, instrumental colour, and sound colour. Among these terms, I used the term “sound colour” to explain the psychological effect of sound. The term “sound colour” focuses more on the function of psychology and sensation than on sound itself. Wayne Slawson discusses the term “sound colour” in his article ‘The Color of Sound: A Theoretical Study in Musical Timbre’:

> Sound color as I am using the term is a psychoacoustic “attribute” or set of attributes of sound, joining such familiar attributes as pitch and loudness. Sound color does not necessarily refer to musical instruments; it is, rather, an abstract property of auditory sensation. By definition it has no temporal aspect. Sounds may vary in color over time, but the variation in a sound is not itself a color. Thus, for example, the “graininess” of a sound, its degree of vibrato, and the characteristics of its attack are not aspects of sound color. (Slawson, 1981, p.132)

In Slawson’s view, the term “sound colour” is related not to sound itself but to “auditory sensation”. For example, when we hear a sound, we can feel the sound is

warm or cold, light or dark and focused or unfocused. I used Slawson's interpretation of the term "sound colour" as a basis to experiment with the psychological function of sound in my music.

During the early stages of research, I focused on the colour of pitch in different registers and dynamics: how each pitch has a different colour, how the pitch can be made lighter or darker in musical colour based on changes in dynamics and registers. However, I shifted towards concentrating more on instrumental techniques due to the fact that the properties of each sound are affected by each instrumental technique. For example, in the strings, the sound created with light bow pressure is different from the sound created with extreme bow pressure, even while the pitch and register may remain unchanged (the former sound being light and weak and the latter being dark and strong). Additionally, string techniques which involve natural harmonics generate sounds that are more shimmering and resonant than techniques which involve half-harmonics. These techniques using half-harmonics produce sounds that can be abrasive as a result of the instrumental technique used to produce the sound. For these reasons, I wanted to further investigate instrumental techniques in order to explore the colour of sound and to classify the techniques with their relating perceived psychological properties.

My main concern regarding musical structure and form in relation to the colour sequence of the scraps of *Jogakbo* is the need to discover a common component between visual colour and musical colour. I decided to use the psychological effect between visual colour and musical colour as this common component. The method to connect the colour spectrum of the scraps of *Jogakbo* to my musical structure and form is as follows: First, I related the colour change of the scraps to each bar's change of timbre with special emphasis on subtly changing the colour between bars. This relates to the beauty of Korea in the decoration on the roof of the Royal palace referred to at the start of my thesis (see p.10), which also has a character of slightly different shades in its components. Secondly, I associated

instrumental techniques with the positive and negative colours (*O-jung Saek* and *O-Gan* Saek) composed of *Jogakbo*. Each visual colour of *Jogakbo* was matched to an instrumental technique, which has the same psychological effect (sound colour). For example, in my baritone saxophone piece *Four Seasons of Jogakbo,* I matched the colours of *Jogakbo* such as black, white, red, yellow, green with the saxophone techniques such as multiphonic sounds, air sounds, slap tongue, and key clicks through common psychological effects, such as seriousness, pureness, excitement, and warmness, between visual colour and instrumental technique. I applied these techniques to each section as a central element of the section and explored the changes of the sound colours between the sections. I will further discuss how visual colour is associated with instrumental technique in the pieces *Four Seasons of Jogakbo* and *Snow Baby in Graz* in more detail.

1.3.3. The philosophy of *Maek*

After researching musical structure and form for the purposes of my compositional process, my focus shifted to the concept of the flow of sound and linearity on a horizontal structural level: How the differences in musical timbre and sound colour between notes, bars and sections could create linearity within the overall structure and how the music flows on a horizontal level despite the fact that the sections are placed side by side without any linkable materials. To discover the answer to these questions, I examined the Korean philosophy *Maek.*

To begin with, to explain the philosophy of *Maek,* it is necessary to discuss *Taoism* from which *Maek* originates. *Taoism* derives from the word "Tao", which means "way", "path", and "principle". The scholar Gilbert Reid states about "Tao":

> This word is best understood if translated as "universal Law," or the "Law of Nature," such a law being *the way or course* in which nature operates, or in which God, the great First Cause, known in Chinese as the Great Extreme, has been operating through the phenomena of the universe. (Reid, 1917, p.79)

When considering Reid's view that "Tao" is already the determinate law of nature operating the "phenomena of the universe", one can surmise that all objects and beings have a destiny laid out and a course to follow. Within this law of nature, there is also an 'invisible flowing energy', *Maek*, which helps the components connect to each other or follow their path in accordance with the laws of nature. To further research the utilisation of *Taoism* in my compositional process, I studied the compositional approach of Isang Yun. The Korean composer Isang Yun describes his music in relation to *Taoism*, thus:

> My composition is an expression of "Tao" in relation to pursuing the principle of "Tao". What looks like the start of my music is just a continuation of what had already existed and resonated beyond hearing. Similarly, what looks like the end of my music is a sound, which continuously resonates beyond hearing.
> (Yun and Sparrer, 1994, p.51 cited in Lee, n.d. p.37)

From this point of view, Isang Yun describes his music as having no beginning or ending. Rather the music flows continuously following the principle of "Tao" in natural space: when the sound starts, it is not new but instead the combination of an existing un-hear-able sound driven by *Maek*. Additionally, when the sound stops, *Maek* drives the un-hear-able resonation or energy of the sound to another point in natural space. Therefore, even though the last sound of the piece has already been sounded, the un-hear-able resonation or energy of the sound continues to flow constantly and linearly in natural space. This linear flow of un-hear-able resonation relates one sound to another sound.

My approach to composition with regards to *Maek* is similar to Isang Yun's, however my compositional process is more departmentalised. For example, Isang Yun's music relates more to "Tao" and the global flow of sound from the music's beginning to its end. However, my compositional approach focuses more on *Maek* between the pitches and sections, and on creating linearity in the flow of sound as opposed to the beginnings and ends of my pieces. To implement *Maek* into my compositions, I employed musical materials such as the rest and the fermata.

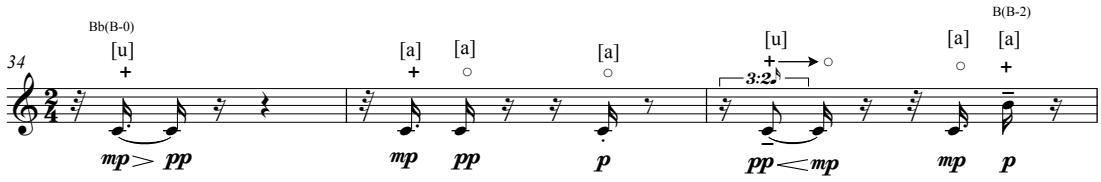


Figure 12 Rests between pitches in *Snow Baby in Graz*

As we can see in figure 12, there are rests between the pitches and these rests interrupt the flow of sound, so the music seemingly stops between the pitches. However, when the written pitch C disappears in bar 34, the reverberant resonation from the sound remains in the duration of the rests. In accordance to the laws of *Maek,* the passage is composed in a manner that allows for the written C in bar 34 to resonate through the rests until bar 35 where it is replaced with the next written C. In this regard, *Maek* plays a role in linking the sounds of the pitches, even though the pitches are not directly connected to each other.

To demonstrate the philosophy of *Maek,* I also included fermatas between the sections. In my music, each section has its own musical character in accordance with timbre while the sections are juxtaposed side by side and so after one section finishes, a new section starts with new musical material and gesture. In this process, the music would seemingly come to a stop between sections, however the fermata between the sections generates a silence in the temporal space and flow, allowing for the existence of *Maek*. For example, in figure 13, I employed a fermata with a silence between the fourth and the fifth section in *Clouds, Landscape, Human Being for five instruments*.

In this space of silence, there exists the connection of decreasing and increasing energies at the same time. For example, after finishing previous section, the performers generate decreasing and disappearing energy. However, the performers also have to prepare for next section, so as to generate increasing and appearing energy. Through the connection of these two energies, the flow of invisible energy can be generated in this space. Therefore, the sections are connected

invisibly, un-hear-ably and linearly by silence, which allows this flowing energy to exist. In this manner, the sections of my composition are connected to each other linearly in a horizontal structure. This process allows my music to flow without stopping and ceasing from beginning to end.

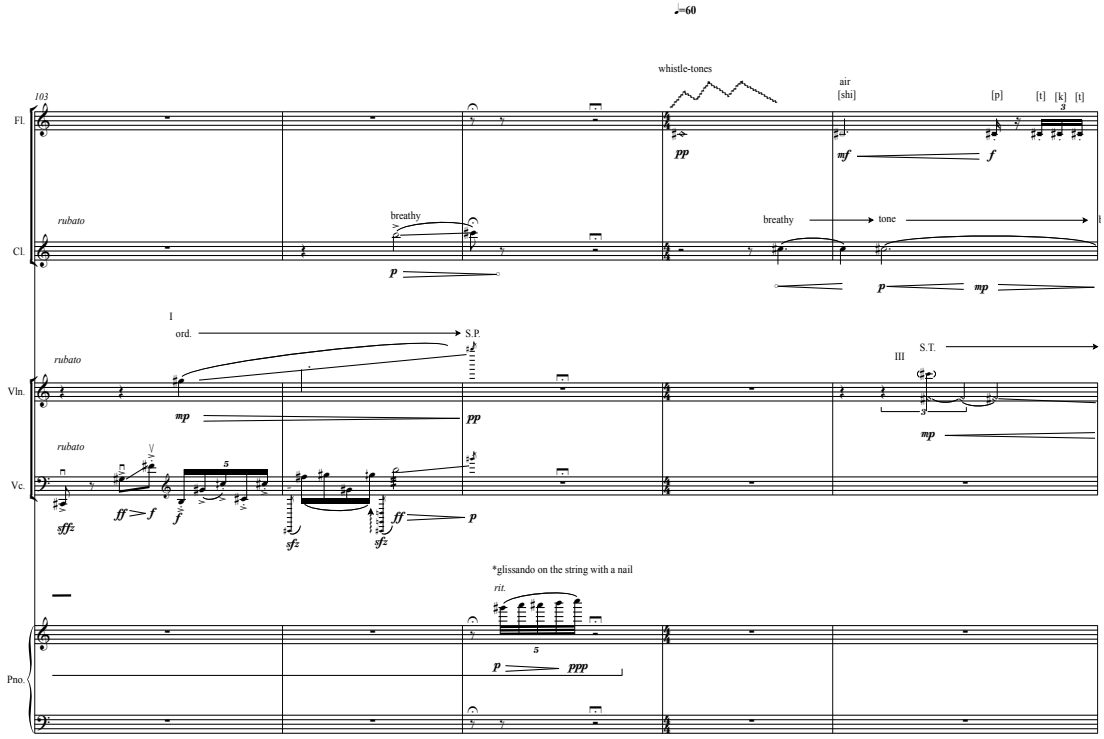


Figure 13 Silence with fermatas between the fourth and the fifth section in *Clouds, Landscape, Human Being*

So far, I have discussed how the Korean philosophies *Yin-Yang*, *Ohang* and *Maek* as well as the colours and shapes of *Jogakbo* have been a source of influence for my musical language and how I have translated these components into musical components. These philosophies and the character of the handcraft art *Jogakbo* are used as musical materials at a local level such as pitch, and at a global level such as structure and form. In the next chapter, I will explain how these philosophies and the character of *Jogakbo* are intertwined in my music. To demonstrate this process, I will discuss my compositions throughout my doctoral studies in more detail.

2. Commentary

The commentary of this chapter will discuss the progression and development of the music in my portfolio in chronological order throughout my doctoral studies. While examining the compositions of my portfolio, I will elaborate upon how my initial interest in exploring timbre, the relationship between the Korean philosophies and my music, and creating my structure based on the character of *Jogakbo* develop within each piece. Furthermore, my interest in the concept of "sound colour" is explained in greater detail in my composition *Snow Baby in Graz* for solo horn in F.

2.1. Water Song (2009)

In the composition *Water Song* for trombone and percussion, I attempted to compose a piece where the form was based on *Jogakbo*. My initial aim was to reflect the structure of *Jogakbo*, in which the shape and colour of the cloth scraps provide ideas for the form of a piece. In this regard, I composed with five sections featuring timbral differences with various gestures, rhythms and the use of different percussion instruments.

Luciano Berio's (1968) *Sequenza V* inspired me to use the elements found within this piece. For example, the use of a metal plunger mute enables the creation of differences of timbre of the same note with the technique of opening (o) and closing (+) the bell. Additionally, Berio's request for the trombone player to sing while playing the trombone allows for multiple concurrent timbres in the sound. These elements to vary timbre are widely used in *Water Song*. For example, I also explored a subtle change in the shades of the pitches, which are generated on the different fundamental notes of the trombone. Furthermore, I used harmonic glissandi techniques to explore the different partials generated from the different fundamental pitches with regards to the theory of harmonic spectra. As the philosophy of *Yin-Yang* revolves around the change of colour from lightness to darkness or darkness to

lightness, the first section replicates this kind of change between lightness and darkness through subtle changes of timbre of the same pitches. For example, in bar 9, the first Eb is played in sixth position and the second Eb is played in third position, creating a delicate change of timbre. Thus, in this phrase, a slight transition of tone colour can be perceived.

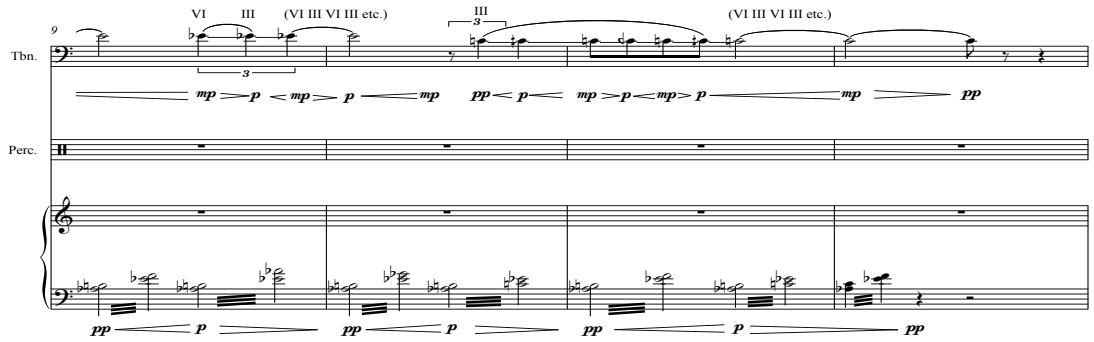


Figure 14 The first section in *Water Song*

In the second section, I wanted to further explore the instrument's structure, so I used harmonic glissandi on different fundamental pitches. The pitches on the trombone are determined by the harmonic spectrum featured in each trombone slide position, allowing for the harmonic glissandi to generate rapid movement through the partials of the fundamental pitches. Thus, the colourful difference of the different partials between the different fundamental pitches might be experienced. Additionally, I changed the percussion from Marimba to Vibraphone to underline the formal sections through differences of timbre.

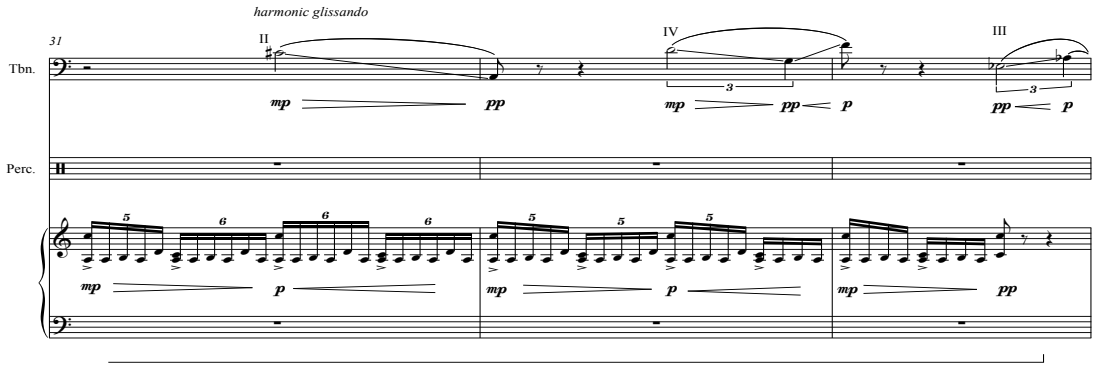


Figure 15 The second section in *Water Song*

I attempted to create more exciting and dynamic gestures in the third section. For this reason, I used tongue rams and growl sounds on the trombone and un-pitched percussion such as tom tom, temple-block and bongo. The repetitive patterns of the un-pitched percussion enlarge the more energetic and lively effect of the sound.

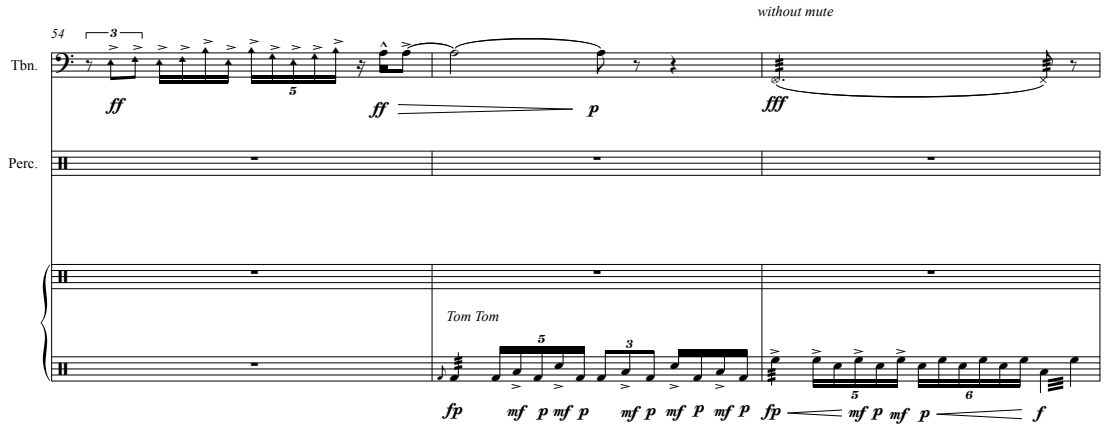


Figure 16 The third section in *Water Song*

As the fourth section is a variation of the first section, slightly different changes of colour of the same pitch are presented on trombone again.

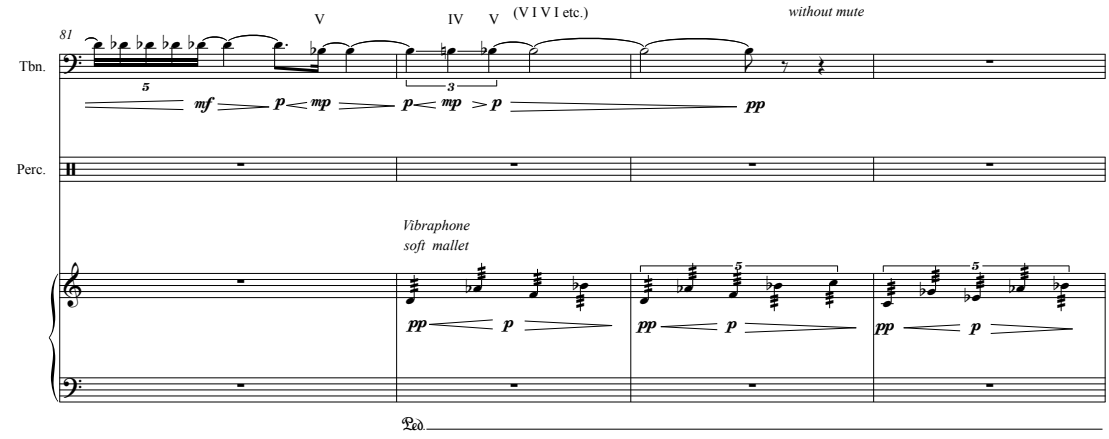


Figure 17 The fourth section in *Water Song*

The fifth section presents the most dynamic and active gestures in the piece; for example, the leaping gestures and lip trills with glissando techniques can be seen in the trombone part. Additionally, suspended cymbal, tom tom, bongo and temple

blocks are employed in the percussion part moving rapidly between timbral categories of skin, metal and wood in the percussion part.

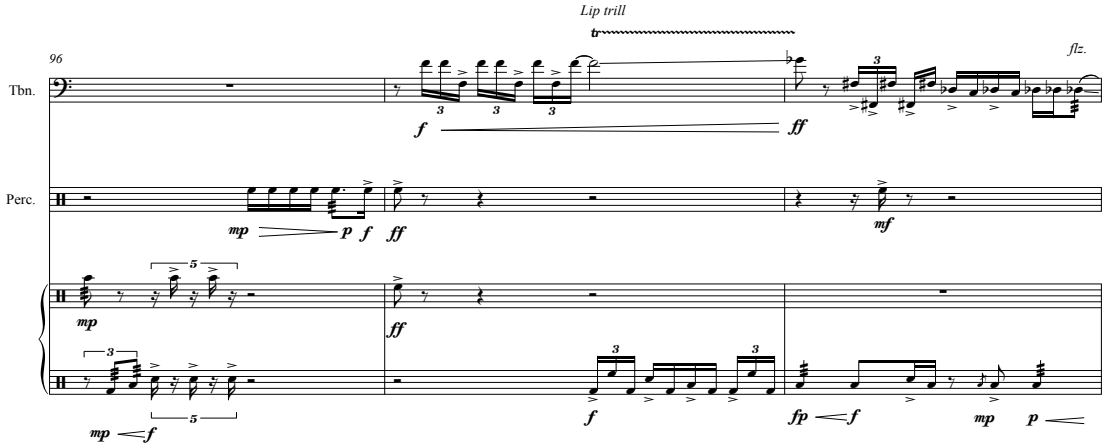


Figure 18 The fifth section in *Water Song*

Water song is the first piece in which I sought to compose a piece while exploring formal articulation through sectional changes of instrumental timbre. The next piece *The Colour of Light* for string quartet also explored a similar form though with more subtle changes, due to the relative homogeneity of timbre of the stringed instruments.

2.2. The Colour of Light (2010)

In *The Colour of Light* for string quartet, I used the harmonic spectrum based on the pitch E as the basis for almost all of the musical material. As the pitch E is a common harmonic pitch on five strings (C,G,D,A,E) except the G string, I chose the pitch E as a central pitch. In the opening section, the same sounding pitches E are presented in harmonics on the instruments. This strategy of using the same pitches in different instruments is similar to Gyorgy Ligeti's (1971) use of pitches in the second movement of his *String Quartet No.2.* Ligeti employs the same pitch G in each instrument in the opening section, and presents slightly different timbres between the pitches. Ligeti also exhibits the changes of timbre by asking the musicians to use their bows in different locations on the strings. Similarly, I utilised

the same sounding pitch E in each instrument available as natural harmonics. This is because I wanted to express a very faint and veiled sound of the ‘figure’ of light as well as to explore subtle differences of timbre. (see figure.6) After the fluctuating sound of the pitch E of the opening, the partials B, G#, and D from the harmonic spectrum of the pitch E appear slowly in each instrument and a fuller harmonic sound is gradually created.

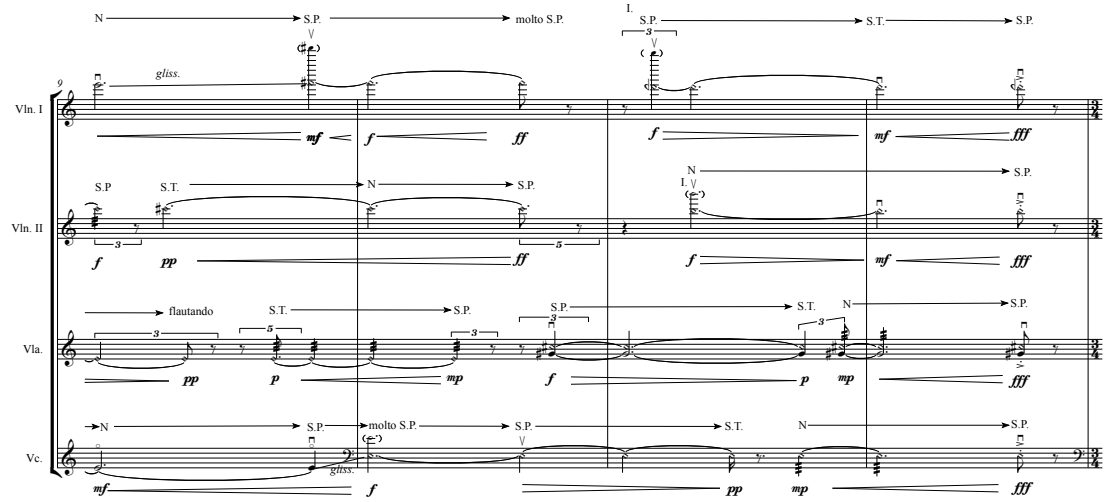


Figure 19 The opening section in *The Colour of Light*

The second section starts with the quartet playing four partials of the pitch E: E, G#, B, and D, at the same time. In this part, I was aiming to express the spectral shape of light, so I used the technique of tremolo at the point of the bow. Additionally, the viola part highlights the partials of the pitch E.

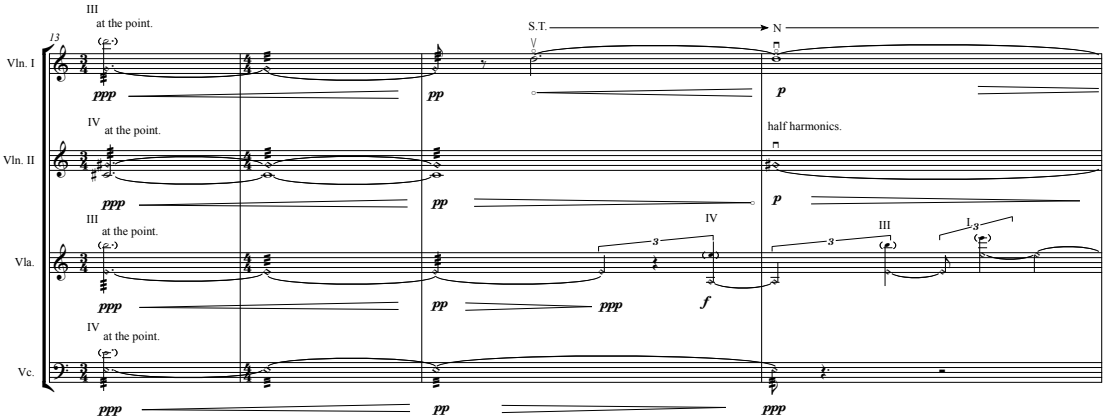


Figure 20 The opening part of the second section in *The Colour of Light*

As the piece progresses, more partials of the pitch E are gradually employed from bar 20 and the partials generate a richer harmonic sound; for example, the pitch F# is presented as the highest note with accent and fortissimo dynamic in violin I in bar 20 and the pitch A is presented in bar 22 in violin II. Additionally, the sounding pitches C and D# are appeared in violin II in bar 24 and in bar 26 respectively. In this manner, the harmonic spectrum of the pitch E is more and more emphasised in the second section.

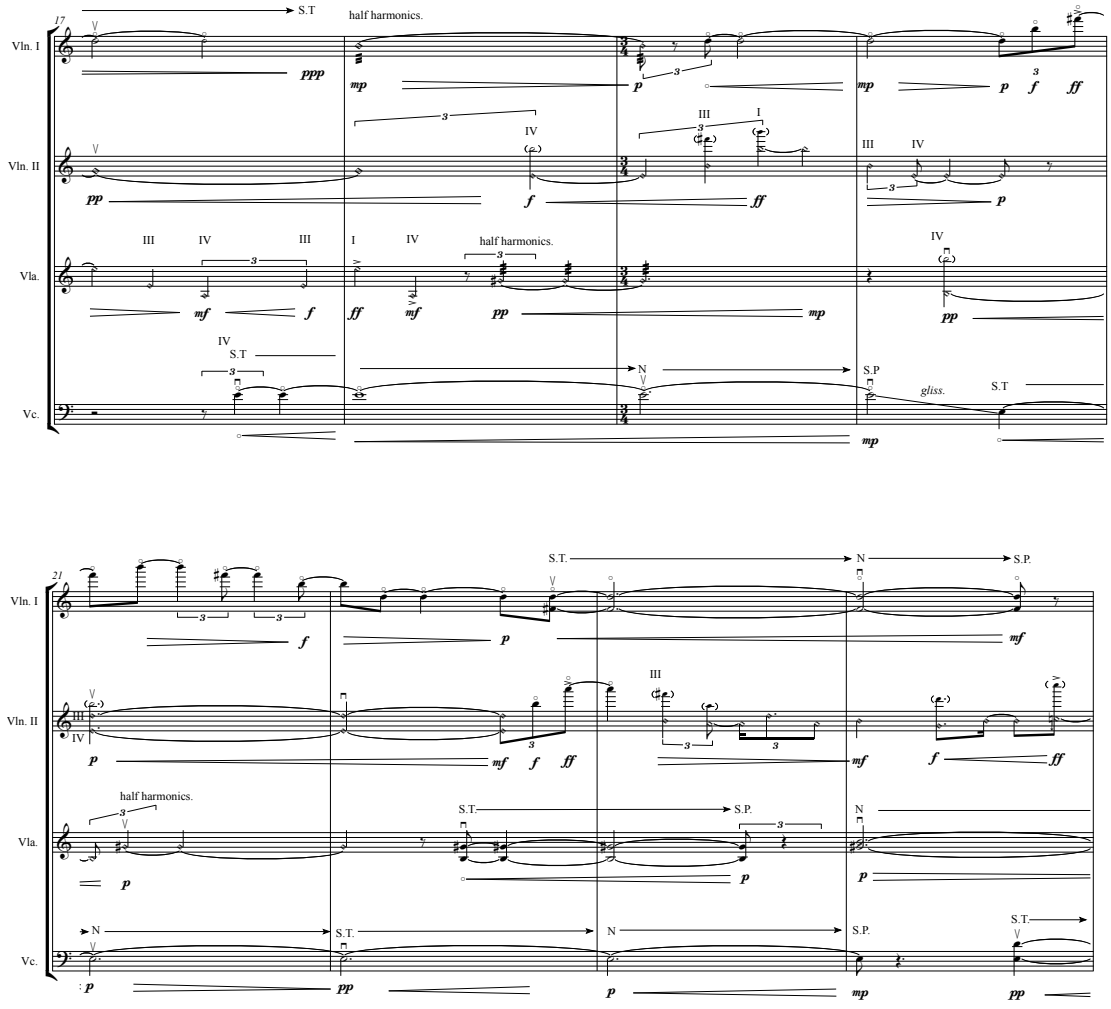


Figure 21 The highlighted partials of the fundamental pitch E

In the third section, I explored the combination of harmonic sound and normal sound. For example, the cello generates the harmonic sound from the pitch G to the little bit lower pitch F. At the same time, the second violin plays the same pitches of

the cello by shifting to an octave higher as normal notes with *flautando* technique in bar 43. This *flautando* technique generates a soft and whispered sound, which helps the harmonics sound of cello to be perceived clearly and strongly.

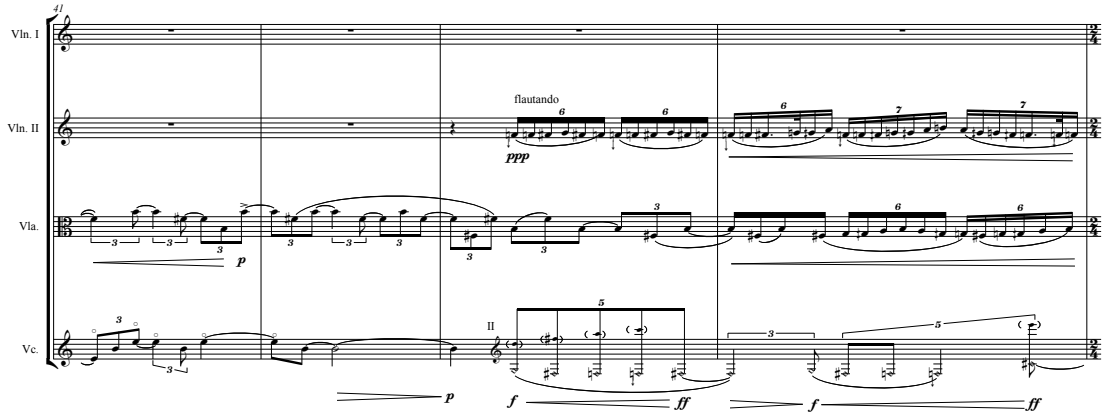


Figure 22 The third section in *The Colour of Light*

In the fourth section, I employed a 'Distorted Spectral Pitch Scale'. This 'Distorted Spectral Pitch Scale' can be seen in my later pieces such as *The Scent in the wind* for solo piano and *The Journey of the Sun* for 16 instruments. My method of creating a 'Distorted Spectral Pitch Scale' is that I chose some partials from the harmonic spectrum of the fundamental pitch intuitively for considering the array of the pitches. In this manner, the figure 23 presents the 'Distorted Spectral Pitch Scale' of the pitch E.

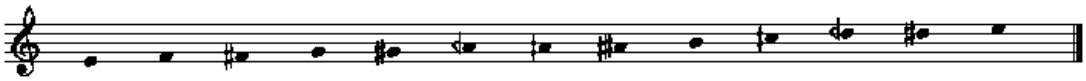


Figure 23 'Distorted Spectral Pitch Scale'

I used this scale as an ascending figure in violin 1 in bar 59 and gradually this scale is presented in other instruments in the fourth section. The altered trajectory of the 'Distorted Spectral Pitch Scale' through the microtonally altered

pitches is intended to express the light deriving from the ‘rays’ of light from the sun, which lack clear or straight trajectories.

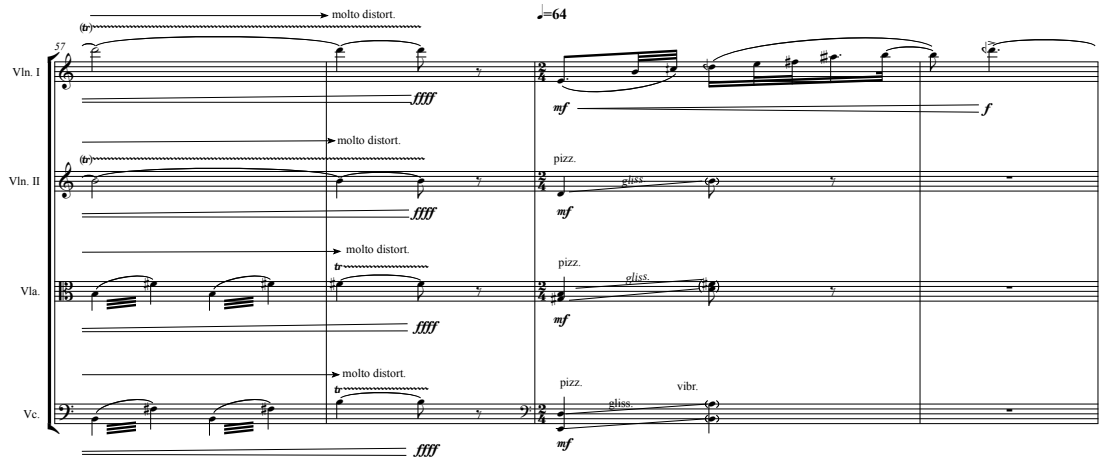


Figure 24 ‘Distorted Spectral Pitch Scale’ in the fourth section

The fifth section is compared with the opening section. In the opening section, music is started as the sound of harmonics and then is gradually changed to the sound of normal pitch throughout the second section. In a reverse procedure, the fifth section is started as the sound of normal pitch and is gradually changed to the sound of harmonics. I wanted to explore this interchange of sound with a variety of string techniques; for example, I employed mutes on the strings to create soft and dense sound. Additionally, the combination of different bowing techniques such as *sul ponticello*, *sul tasto, senza vibrato* and *vibrato*, help create complex timbral textures in the resulting sound.

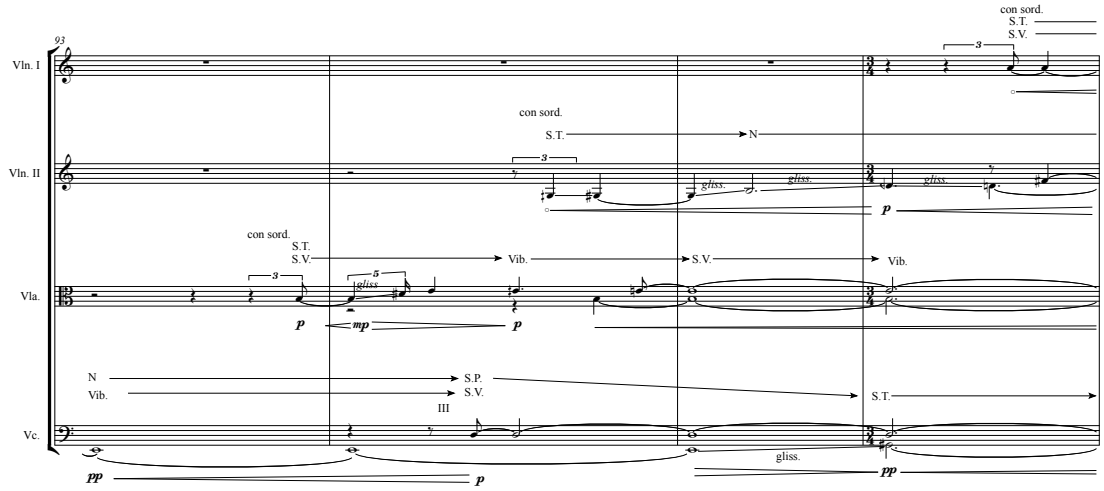


Figure 25 The fifth section in *The Colour of Light*

The next section is composed of leaping notes and glissandi. The interval of the leaping note gets narrower and leads to a glissando technique generated on one note. This glissando technique symbolises the shape of the intensity of shining light.

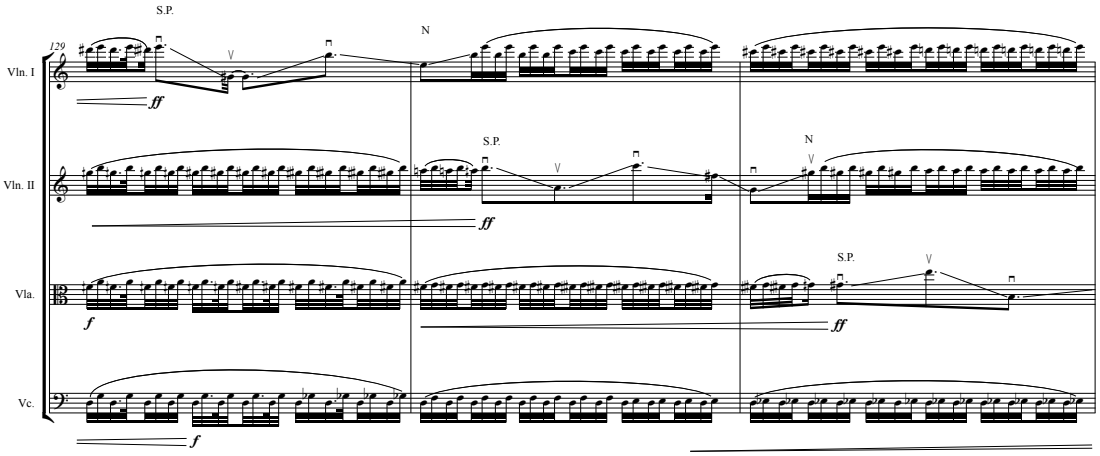


Figure 26 The glissando technique in the sixth section in *The Colour of Light*

In the last section, the sound becomes more distorted and noisy with vibrato glissandi and extreme bow pressure technique. Descending glissandi with vibrato and *molto distort.* technique symbolises more intensive and darker shades of light. This distorted sound is most dramatic in the piece and hints at the ending of the work.

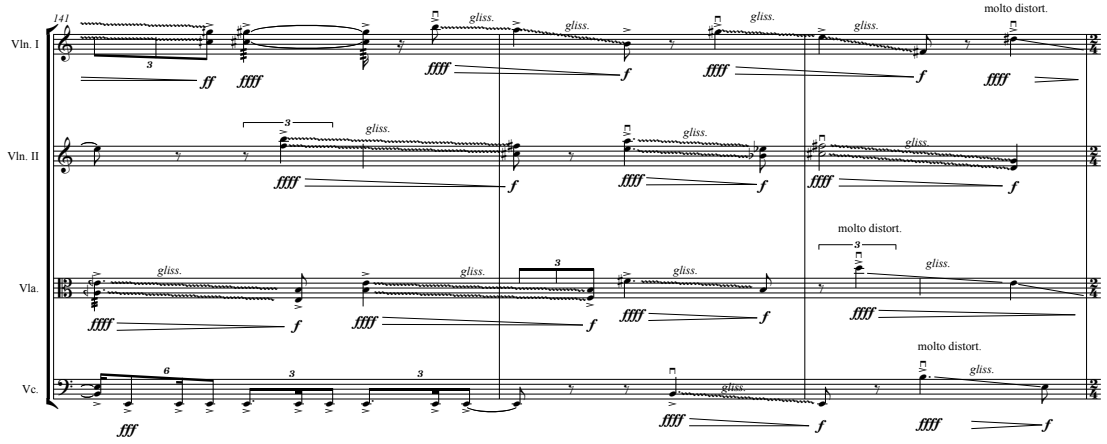


Figure 27 The last section in *The Colour of Light*

The different string techniques play an important role in each section to present the difference of timbre between sections. The use of these techniques was successful in creating a sectional-based form, and this success encouraged me to focus more on exploring instrumental techniques to generate further articulations in musical structures.

2.3. Fan Dance (2011)

My approach to *Fan Dance* for trumpet and string quartet was different from the previous two pieces. The previous pieces were quite highly pre-planned in relation to the timbral elements or the pitch materials of each section. However, *Fan Dance* is far more intuitive in the choices of pitches and in the whole structure and form. In this piece, I focused on exploring the instrumental technique of the trumpet and the harmonised sound of trumpet and string quartet. I applied the performance aesthetic of the traditional Korean 'Fan Dance' into my thinking in the piece.

'Fan Dance' is a Korean traditional group dance. A few women dance together and make beautiful shapes such as flowers and clouds with fans. The fascination of the 'Fan Dance' is that when the fan is folded, unfolded, spun around, and sprinkled, the sounds of squeaks are generated, and these sounds are harmonised with the accompanied Korean traditional music, so the sound adds to the overall sensory pleasure of the dance. Furthermore, when the women dance, they

wear Korean traditional cloth. When the women stretch out their arms, their clothing generates lines, parabolas, and curves. Additionally, the spinning movement of fans creates the blooming shape of flowers. All of these effects result in the ‘Fan Dance’ being a beautiful and special performable art. I translated these ideas and shapes into my composition.

Figure 28 Fan Dance
(Reuters, 2013)

To begin with, in order to express the folding and unfolding shapes of fan, I worked with changing the meters for the length of quavers in each measure in the first and last sections. For example, to reflect the shaping of the folded fan, the meter is decreased for the length of quaver from bar 2 to bar 8. In contrast, the meter is increased from bar 9 to bar 14 to reflect the shape of the unfolded fan increasing its span.

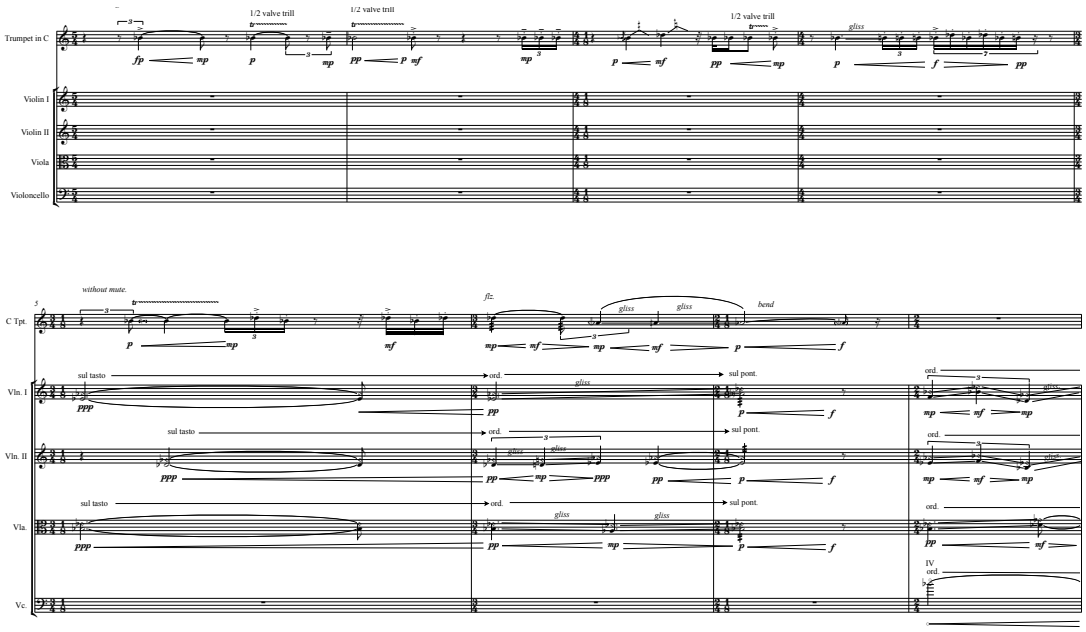


Figure 29 The decreasing meter change

Second, I employed an arch form of linear lines in the string parts to express the ‘Fan Dance’s lines of parabola and curve. For example, violin I plays an ascending line bar 33 and a descending line bar 34-35. This combination of ascending and descending lines form arch shapes, and for me, are associated with the lines of parabola and curve of ‘Fan Dance’.

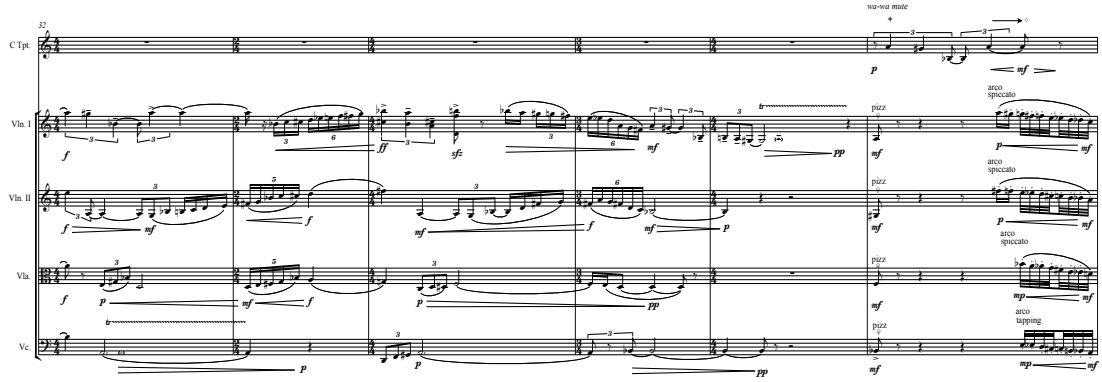


Figure 30 The arch form of the linear pitch progression

In order to express the spinning shape of fans, I used the repetition of several pitches featuring leaping gestures and the flutter tongue technique in the trumpet part

in the last section. To reflect the centrifugal force generated when the fan is spinning, I employed repetition of leaping pitches.

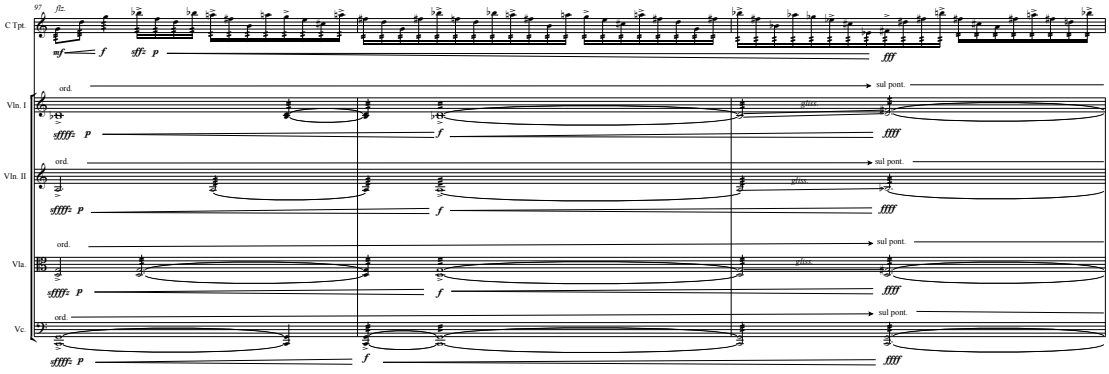


Figure 31 The repetition of the pitches in trumpet

Fan Dance is the first piece where I applied my Korean cultural background to the music directly. This application of Korean cultural background can also be seen in the next piece *Mesmerizing Jin-yi Hwang.*

2.4. Mesmerizing Jin-yi Hwang (2011)

I used a Korean traditional poem, written by Jin-yi Hwang (Joseon Dynasty (1392-1910)) in the piece *Mesmerizing Jin-yi Hwang* for solo mezzo soprano. My initial idea was to explore the difference between words and sounds, that is the difference between semantic meaning and the expressiveness of pure sonic material. For this reason, I wondered whether for listeners who do not understand Korean, if the language as sound would lead to differences in how the music can be understood? If this were so, how could I use the text of the poem to deliver the meaning of the Korean words to the listeners? These initial questions served as a momentum to compose this piece.

First, I used the Korean words as a source of phonetic sounds; for example, I divided the word “cheing” (which means blue) to “ch” and “eing” and “jalang” (which means boast) to “ja” and “lang”. To create a form based on sections, I divided the Korean text into five sections, with each section composed of phonetic fragments of

the Korean words. After arranging the phonetics derived from the Korean words, I looked at the English translation of each phrase.

	Korean	**English**
The first section	Cheing san li byuk gay su ya	Respectable Byuk Gay-Su
The second section	Su I gam eul jalang ma ra	Do not boast of leaving so early
The third section	Il do chang he ha mawn Dol a o gi eo law u ni	When you venture out to the sea, it will be difficult to return
The fourth section	Mawng wour i man gong san ha ni	The full bright moon above the empty mountain
The fifth section	Shi eo gan deul eo teo ha li	How about staying here to rest

Figure 32 The phonetics of Korean and the meaning in English in each section

The other point for the composition of this piece was to employ the patching technique of *Jogakbo*. I used the patching technique to generate my own musical language by composing measures that have similar shapes juxtaposed side by side. For example, the measures are juxtaposed from bar 1 to bar 3 with similar shapes in the use of speaking sounds. However, I changed the rhythms from four quaver notes from bar 1 to a quintuplet in bar 2 and then to a sextuplet in bar 3. This use of rhythmic change reflects the slightly different shapes of the scraps in *Jogakbo.*

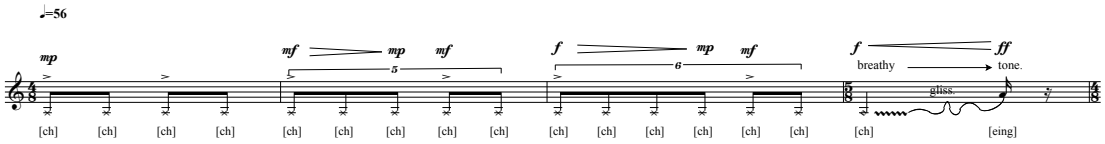


Figure 33 The rhythmic change

In order to express the change of colours of the scraps in *Jogakbo*, changes of vocal techniques are utilised. For example, in bar 20 and in bar 23, similar rhythmic patterns are used. However, the speaking technique is used with semiquaver triplets in bar 20, whereas the normal pitch changing to breathy sound with glissando technique is used in bar 23.

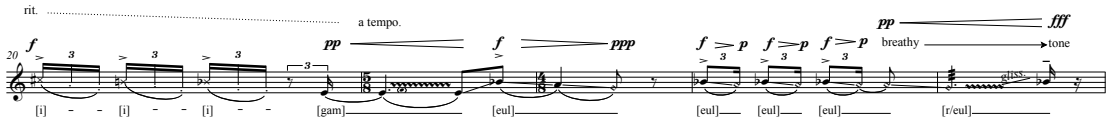


Figure 34 The different vocal techniques in bar 20 and in bar 23

Mesmerizing Jin-yi Hwang presents the different concepts of word as meaning and as sound as well as the character of *Jogakbo*, working with an irregularity of formal plan akin to the scraps and patching technique of *Jogakbo*.

2.5. The Scent in the Wind (2011)

In *The Scent in the Wind* for solo piano I sought to find stronger musical analogues with the character of *Jogakbo*, where spontaneity within the law of irregularity is generated. I explored a variety of piano timbres, especially multiphonic sounds and use of harmonics by preparing the piano's strings to create a complex hierarchy based on these timbres in the musical structure. I also explored how small structures can be nested in a formal canvas and landscapes. Therefore, this shape of nested fragments in large landscapes was something central to this composition's conception.

As discussed in the chapter 1.3.1. 'Pitch Organisation', the central pitches are C, Db and D, and I explored multiphonic sounds, which are generated from the pitches C and Db, to compare the colours between the multiphonics and nomal pitches. Furthermore, I composed with the harmonic pitch B based on the low pitch G

to use the medium between multiphonic sounds. This is because the pitch B is the nearest tone of one of the components of multiphonics such as the pitch B, 1/6 lower tone of B, and a lower quarter tone of B. Furthermore, in order to explore the philosophy of *Yin-Yang,* the harmonic sound B is used with the multiphonic sounds at the same time and to present of the different timbre and colour from the multiphonic sounds.

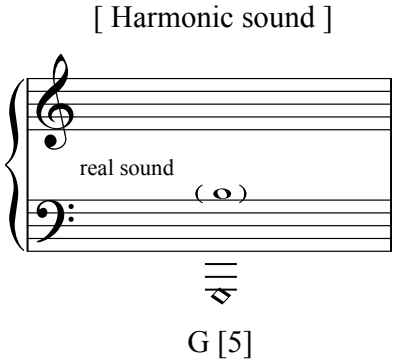


Figure 35 The harmonic sound B generated on the pitch G

In the first section of *The Scent in the Wind,* I used two different multiphonic sounds in order to cause tension. Two multiphonic sounds emerge in turn in bar 1-2 and they are performed simultaneously in bar 3 to give punctuation. In order to set up a complex hierarchy of musical sound, the unprepared pitches C and D are played in bar 6. Therefore, normal sounds are nested into the multiphonic sound. This nested component's character can be seen with an interaction between meter and rhythm. In figure 10, the meter of each measure is changed as a ratio 5-4-3-1-3-5-4 in the first section. Similarly, the rhythmic pattern of the pitches C and Db in bar 6 is shown up in the ratio 5-4-3-1-3-5-4 based on semiquaver (see figure. 10). Therefore, the combination between meter and rhythm shows that small elements and large elements build a variety of hierarchies in music.

This nested component is also explored from bar 41 to 61. In this section, I

combined multiphonic sounds, a harmonic sound and unprepared pitches. In figure 36**,** the pitches C and Db are performed in a high register and the multiphonic sound of the lowest pitch Db is performed at the same time. In bar 45 I added the harmonic pitch B allowing for the unprepared pitches and the harmonic sound to be nested into multiphonic. In this way, all timbral categories are brought together into a harmonised single relationship.

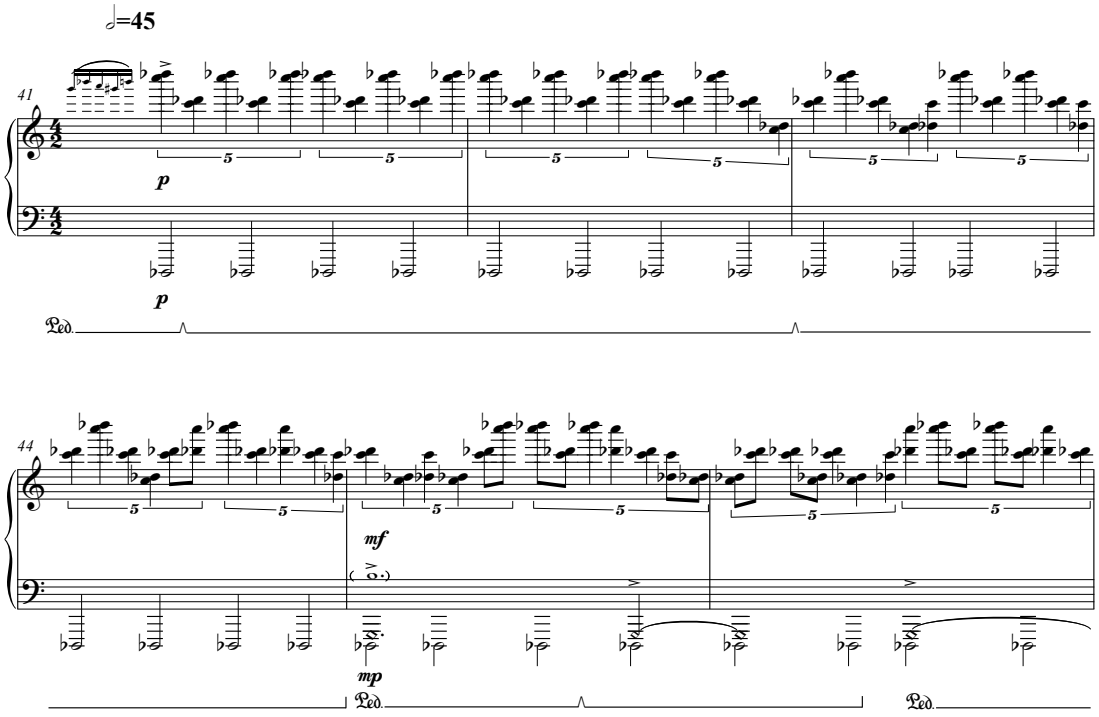


Figure 36 The nested components

In this piece, I also employed a ‘Distorted Spectral Pitch Scale’. First, I used multiphonic notes from the lowest pitches C and Db, and then I added the pitches G and A. The pitch G is from the lowest pitch G, which generates the harmonic sound B and the pitch A is added in order to connect between the pitch G and Bb for considering the natural flow of scale. This ‘Distorted Spectral Pitch Scale’ is used in the second section and the fifth section as an ascending scale.

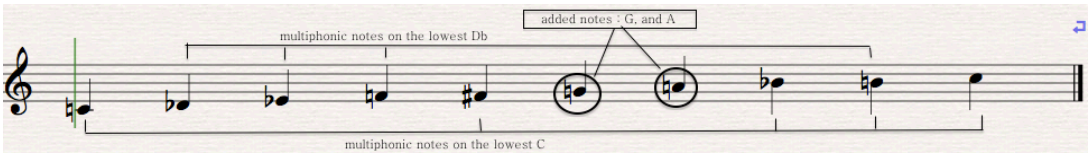


Figure 37 ‘Distorted Spectral Pitch Scale’

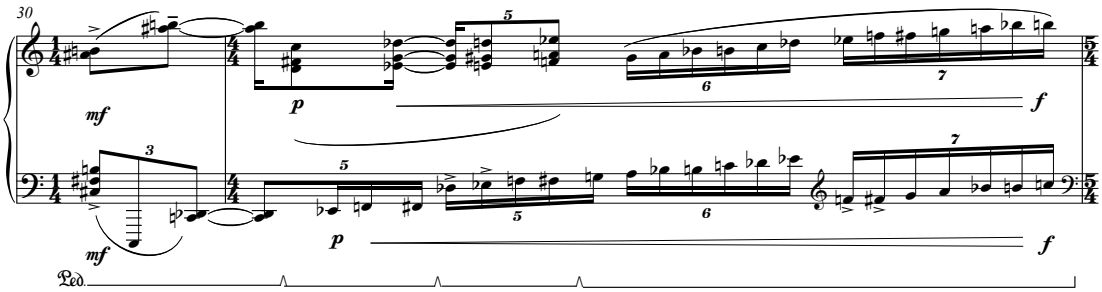


Figure 38 ‘Distorted Spectral Pitch Scale’ in the second section

My interest in the character of *Jogakbo* is also reflected into this piece, for example the patching and stitching techniques of *Jogakbo* are used to connect between measures or sections. The use of these techniques provides a method of creating an intertwined structure. For example, *The Scent in the wind* is made up of five sections and each section is associated with the following section by stitching and patching techniques. For this reason, the stitching and patching techniques are employed as the linking parts.

Multiphonic Sounds + Unprepared Pitches	Stitching technique	Distorted Spectral Pitch Scale	Stitching technique	Multiphonic Sounds + Harmonic Sound + Unprepared Pitches	Stitching techqnique	Extended stitching technique	Patching technique (rest)	Distorted Spectral Pitch Scale + Multiphonic Sounds + Harmonic Sound

Figure 39 The form of *The Scent in the Wind*

The primary method of stitching technique that I employed in this piece is a rather literal imitation of the shape of the stitches in *Jogakbo* with chords and

arpeggios. The chords and arpeggios are played either synchronously or asynchronously. These elements of the stitching technique are sometimes combined with the multiphonic sounds. For example, the multiphonic sounds of the pitches C and Db can be seen in the second linking part.

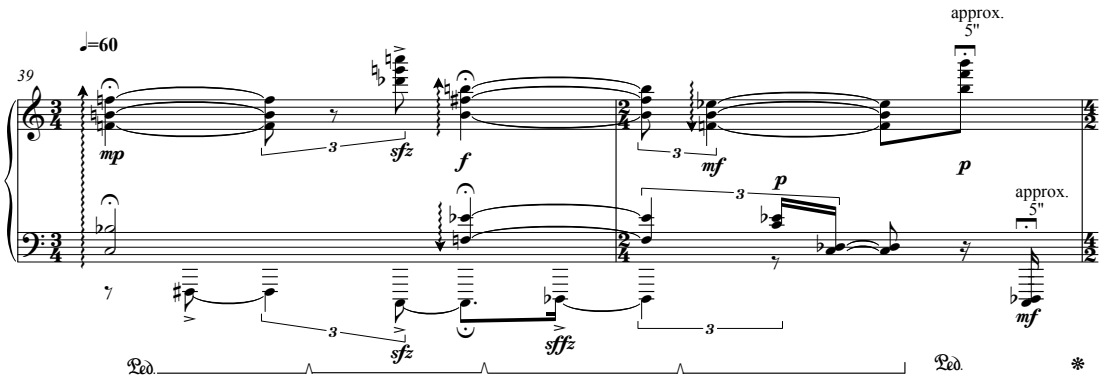
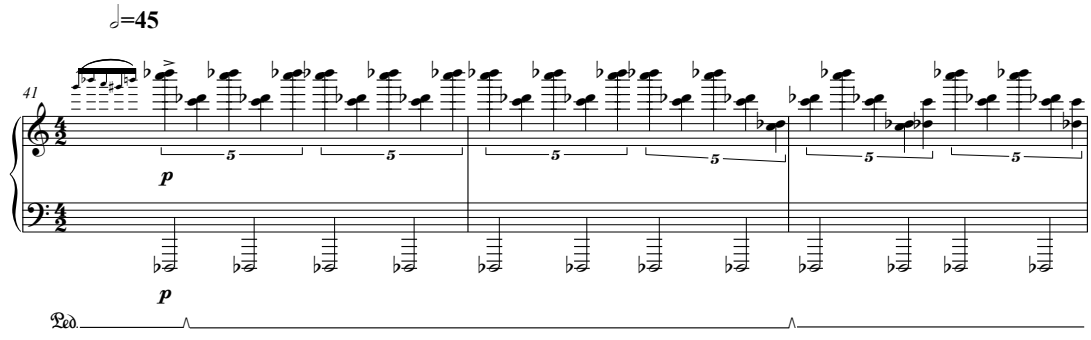


Figure 40 The stitching technique 1

The stitching techniques of small concepts are also used as a mediator of musical elements; for example, the first five ornament notes in bar 41 play a role not only in linking notes between the second section and the third section but also in including notes of the third section. The shape of these ornament notes is extended as a normal rhythm in the last notes of the third section and is used the first bar of the fourth section. Therefore, these ornament notes are used as a linking factor between notes, and demonstrate the nested component in this piece.



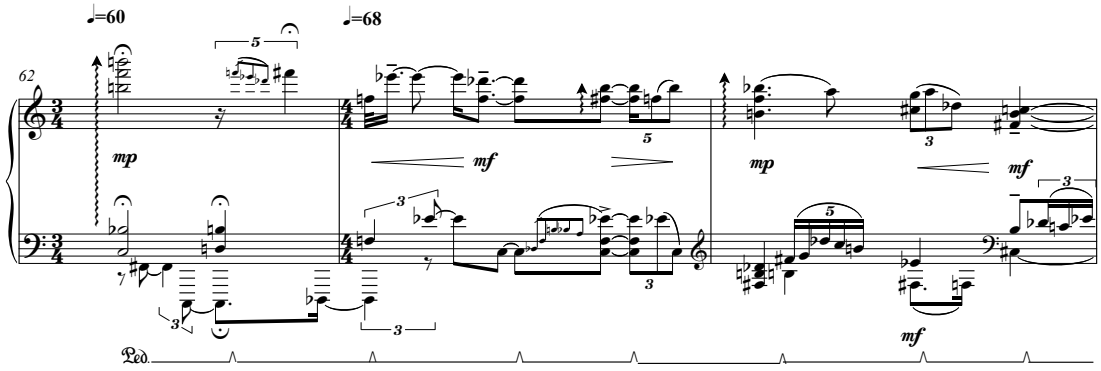
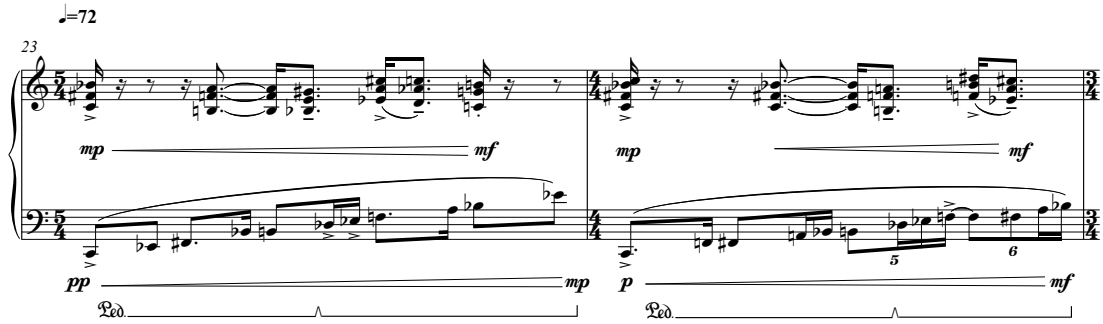


Figure 41 The stitching technique 2

The patching technique is used throughout music. For example, in the second section, each measure emerges in a reductive shape and in the third section; the measures having similar shapes are juxtaposed side by side. Furthermore, the patching technique can also be seen as the bridge between the fourth section and the fifth section. There is an empty measure featuring a long fermata between the two sections and, in this empty measure, there exists a silence connecting the two sections. I explore the invisible flowing energy from the philosophy of *Maek* in this space. For example, the previous sound of the fourth section decays, and suggests a decreasing energy. At the same time, an increasing energy is generated by the performer preparing to play the fifth section in this space, which for me is a way of imagining an invisible energy flowing across the sections.



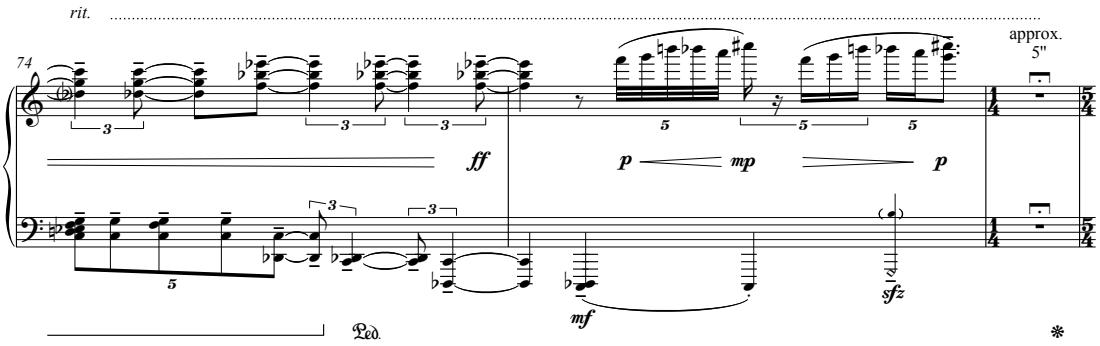


Figure 42 The patching techniques in the second section and between the fourth and fifth section

In *The Scent in the Wind*, I explored a variety of piano timbres through the usage of multiphonic sounds, harmonic sound and unprepared pitch sound to reflect the tactility experienced from the different layers of blowing wind. Additionally, the structure of *The Scent in the Wind* reflects the visual shape and techniques of *Jogakbo*, through the means of reflecting patching and stitching, more directly than the previous pieces. I further explored this character of *Jogakbo* and harmonic spectrum in the next piece *The Journey of the Sun* for 16 instruments.

2.6. The Journey of the Sun (2012)

In *The Journey of the Sun for 16 instruments*, I focused on the patching technique of *Jogakbo* to compose a form based on several sections. I also explored harmonic spectrum of the pitch A in the piece. For example, the combination of partials based on the low pitch A can be seen in the first section.

In the first section, I combined the partials vertically and horizontally. I chose six partials of the low pitch A intuitively in bar 1-6. These chosen partials migrate into other instruments and are combined with new partials in bar 7-12. Additionally, in order to generate a progression, I created an ascending linear line with the specific partials in violin I, II, and viola.

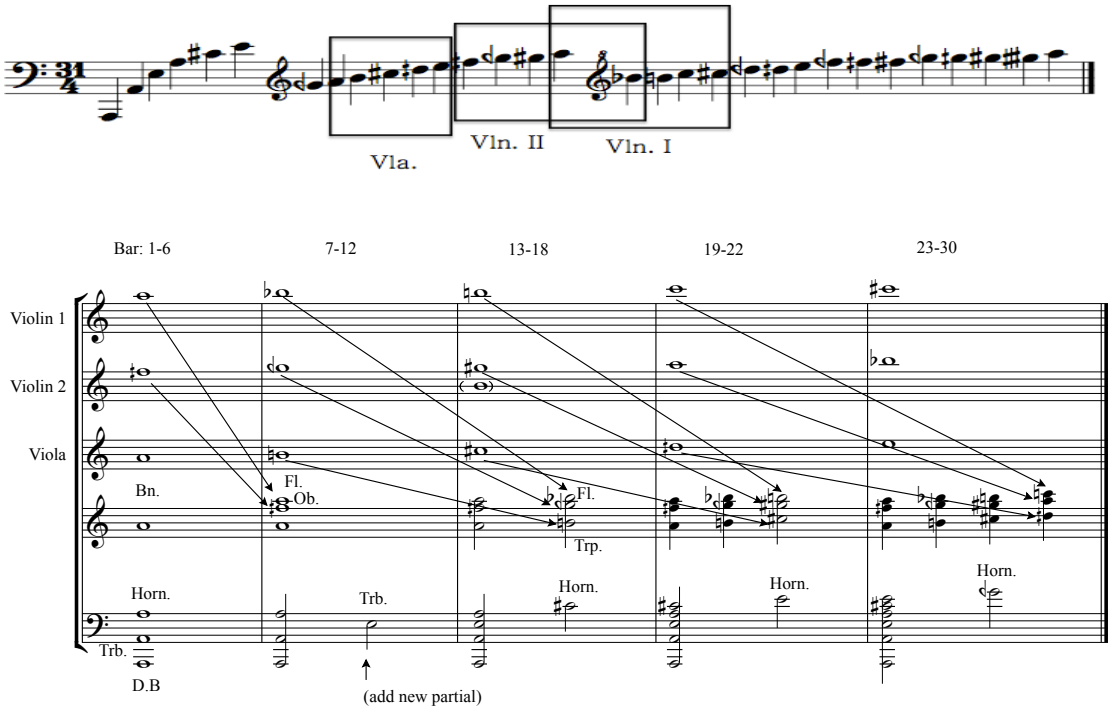


Figure 43 The partials of the low pitch A in the first section

In the second section, I attempted to explore the differences of timbre between brass instruments. For example, I used the straight and wa-wa mutes in each brass instrument (I used bass-trombone wa-wa mute on horn) to explore the different tone colour of each instrument

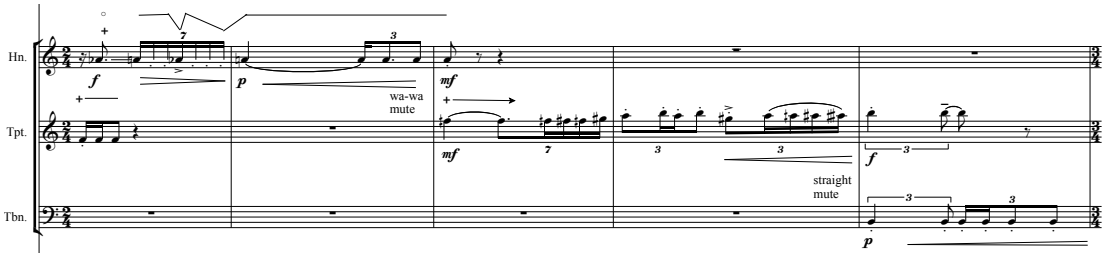


Figure 44 The second section in *The Journey of the Sun*

In the third section, I used ‘Distorted Spectral Pitch Scale’ in the woodwind and string parts. Having multiple instruments playing the 'Distorted Spectral Pitch Scale' simultaneously allows for a better observation of the different timbres created by each of the instruments.

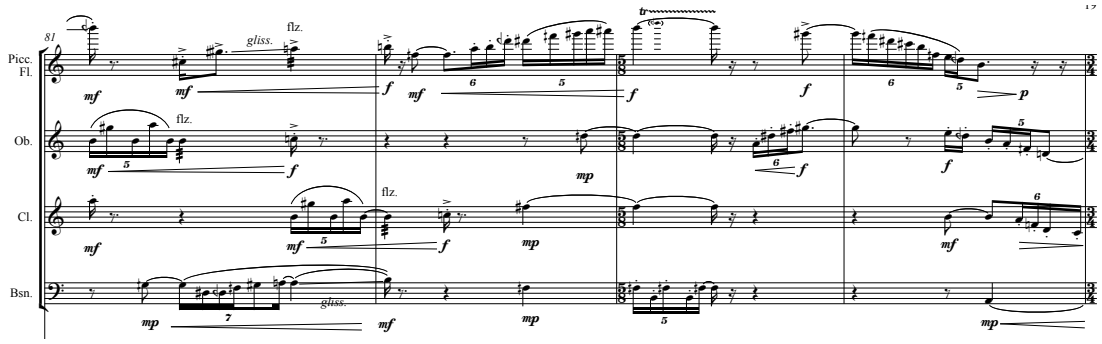


Figure 45 The third section in *The Journey of the Sun*

In the fourth section, I specifically explored the philosophy of *Yin*-Yang. To apply the philosophy of *Yin-Yang* to the transition of sounds in a vertical manner, I researched the concept of "Harmonicity-Inharmonicity", which is associated with spectral composers such as Gérard Grisey.

In the article 'Introduction to the Pitch Organization of French Spectral Music', Rose discusses the technique of "Harmonicity-Inharmonicity", which Grisey (1975) used at the beginning of *Partiels*. The first harmonic structure of *Partiels* is composed of an overtone derived from the low pitch E. While this harmonic spectrum is termed "harmonic", if any elements are not included in the harmonic spectrum, then this organisation is termed "inharmonicity". The first chord features the harmonic spectrum of the low pitch E. During the eleventh repetition of this sonority, the components move to a lower register, through "octave shifting". Therefore, the sound changes to become more and more inharmonic, and noise elements are combined to the orchestration. Consequently, few partials of the low pitch E remain in the sonority. (Rose, 1996, pp.8-10)

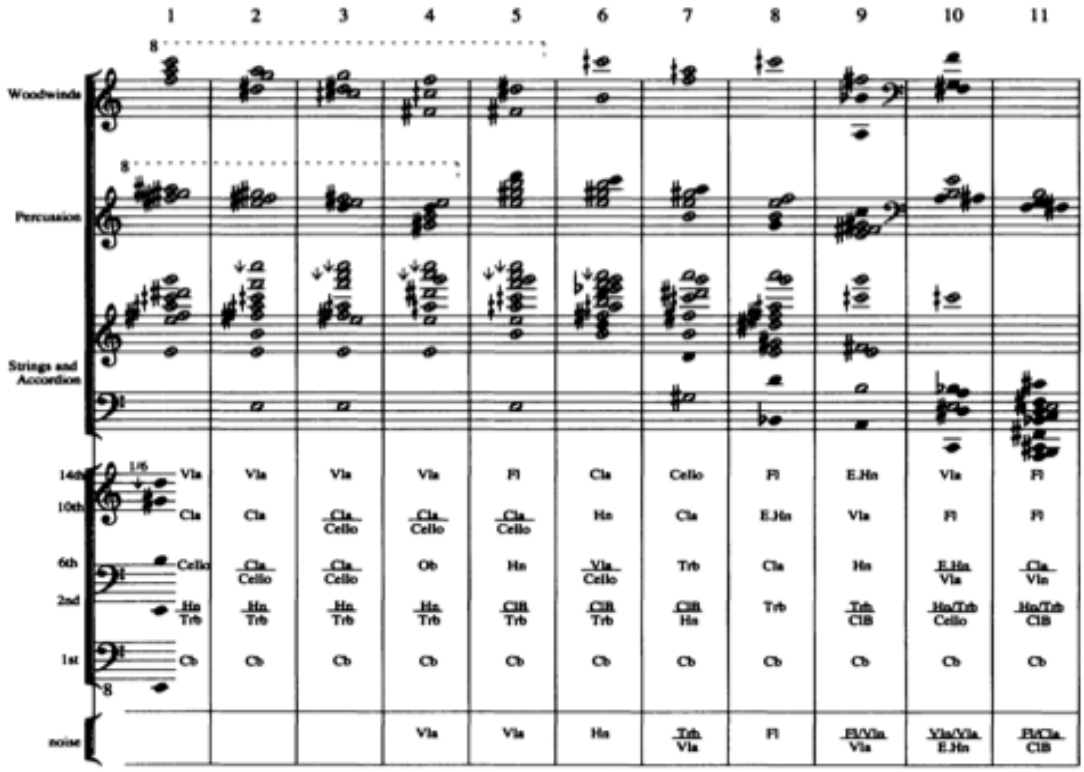


Figure 46 “PROGRESSION FROM HARMONICITY TO INHARMONICITY IN *PARTIELS*”

(Rose, 1996, p.10)

The formal approach demonstrated by Grisey with his “Harmonicity-Inharmonicity” technique where the transformation of sound based on these two opposite sounds occurs provided an idea for me. I thought that “Harmonicity” could be considered as a light and positive sonority while “Inharmonicity” could be considered as a dark and negative sonority. Therefore, enabling the transition of the sonority from “Harmonicity” to “Inharmonicity” to reflect a flowing sound or energy from positive to negative. In this context, I wanted to follow up on Grisey’s “Harmonicity-Inharmonicity” technique in the fourth section.

In this section, I also took inspiration from elements explored by Unsuk Chin (2009) in her work *Su* for sheng and orchestra. Her work explores the slow change of long notes with different techniques and dynamics, and this gradual change shows the transformation of the density of sound. I was interested in the slow change of

sound, so I combined the transformation of long notes and the “Harmonicity-Inharmonicity” technique of Grisey in this section. For example, sound is translated from a more dissonant and complex state to a consonant and clarified state. All the components used at bar 97-109 can be seen in figure 47. I have expanded on Grisey’s techniques and created my own interpretation. Grisey moves some partials downward by octave shifting in the harmonic spectra, thus he achieves an inharmonic sound. I, on the other hand, added inharmonic pitches directly into harmonic spectra to produce a dissonant sound. These inharmonic pitches are positioned in a narrow register, therefore allowing for a dense and dissonant sound to be generated.

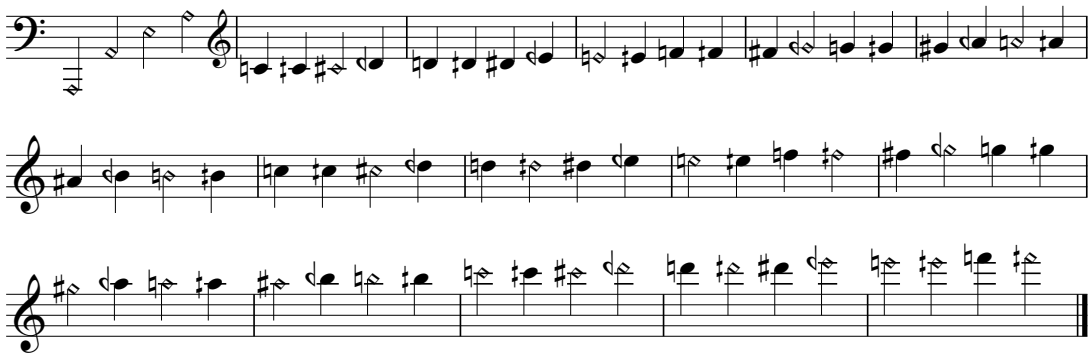


Figure 47 Pitch components in *The Journey of the Sun*

Figure 47 demonstrates the pitches used in the fourth section. The pitches are arranged by 1/4 tone from middle C. The reason for this is 1/6 or 1/8 microtone lower or higher pitches are difficult not only to be perceived clearly but also to be played accurately. I chose this degree of pitch ‘Justification'. The pitches with diamond note heads are components of a harmonic spectrum derived from the low pitch A, while the pitches with black note are not related to the harmonic spectrum and in this manner, the black note head pitches can be defined as ‘Inharmonic’. The pitch zones are then combined to create a transition from inharmonic sound to harmonic sound.

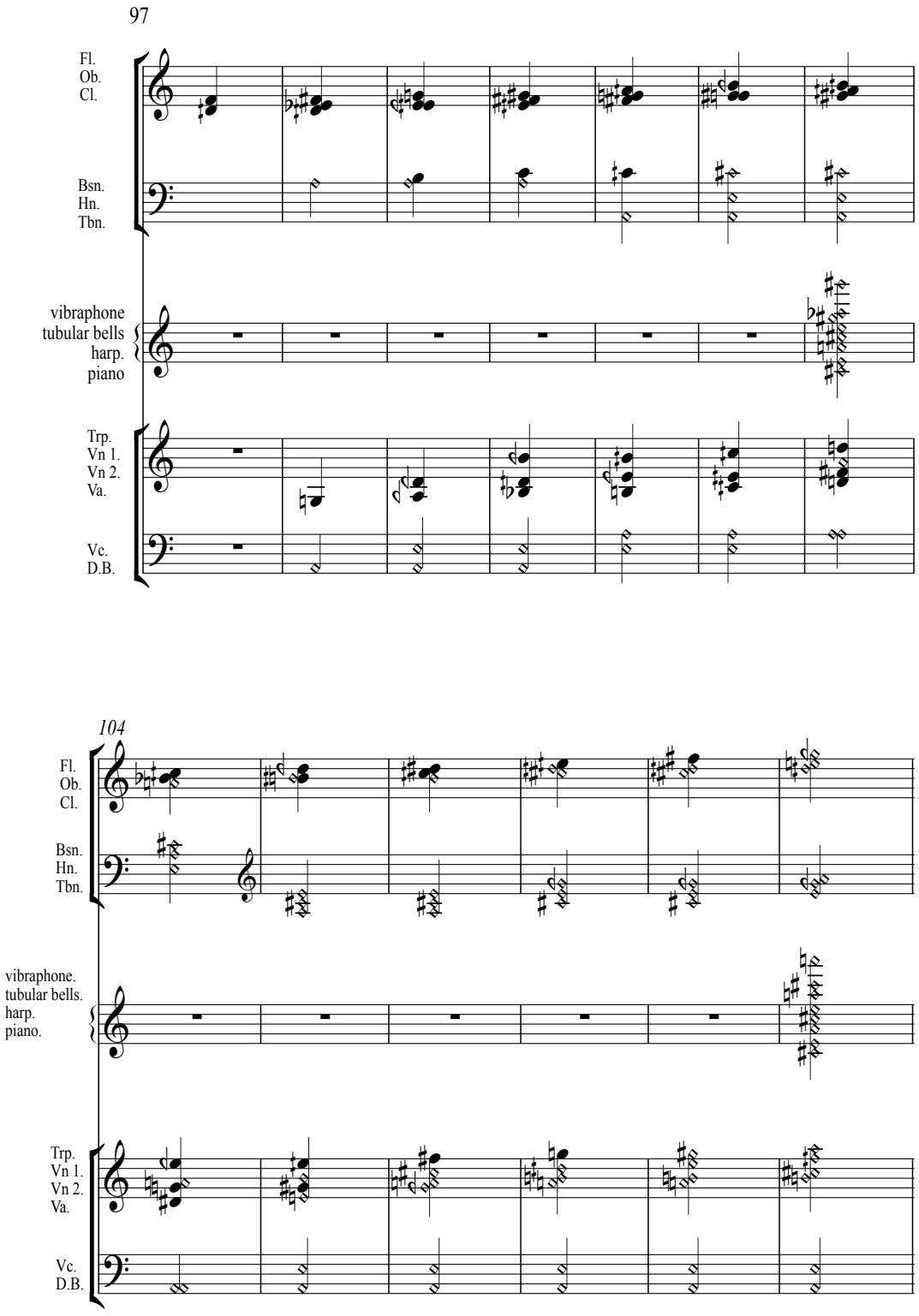
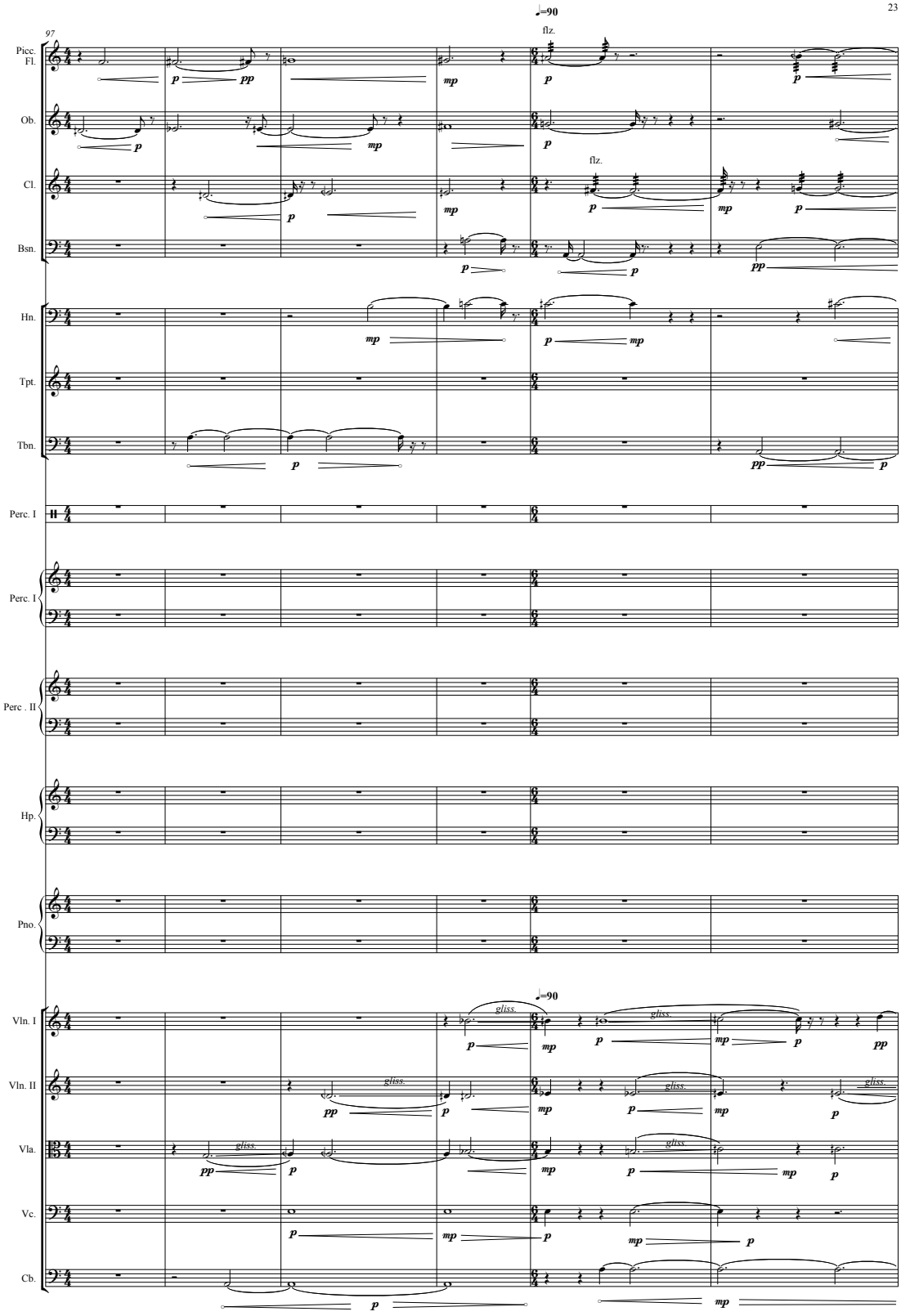
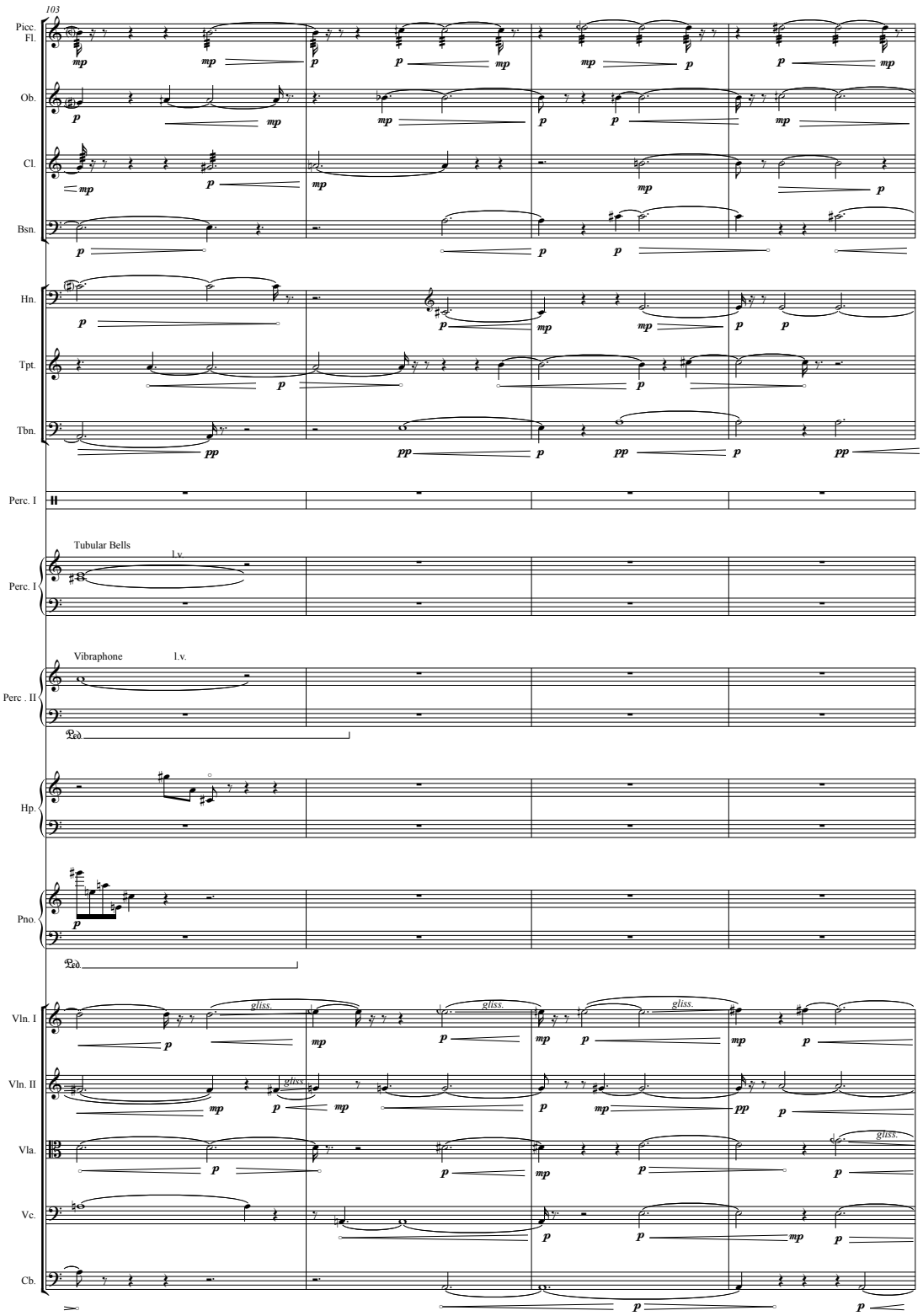


Figure 48 The progress of chords at bar 97-109


97
♩=90
flz.
Picc.
Fl.
Ob.
Cl.
Bsn.
Hn.
Tpt.
Tbn.
Perc. I
Perc. I
Perc . II
Hp.
Pno.
Vln. I
Vln. II
Vla.
Vc.
Cb.
gliss.


103
Picc.
Fl.
Ob.
Cl.
Bsn.
Hn.
Tpt.
Tbn.
Perc. I
Tubular Bells
l.v.
Perc. I
Vibraphone
l.v.
Perc . II
Hp.
Pno.
Vln. I
Vln. II
Vla.
Vc.
Cb.
gliss.

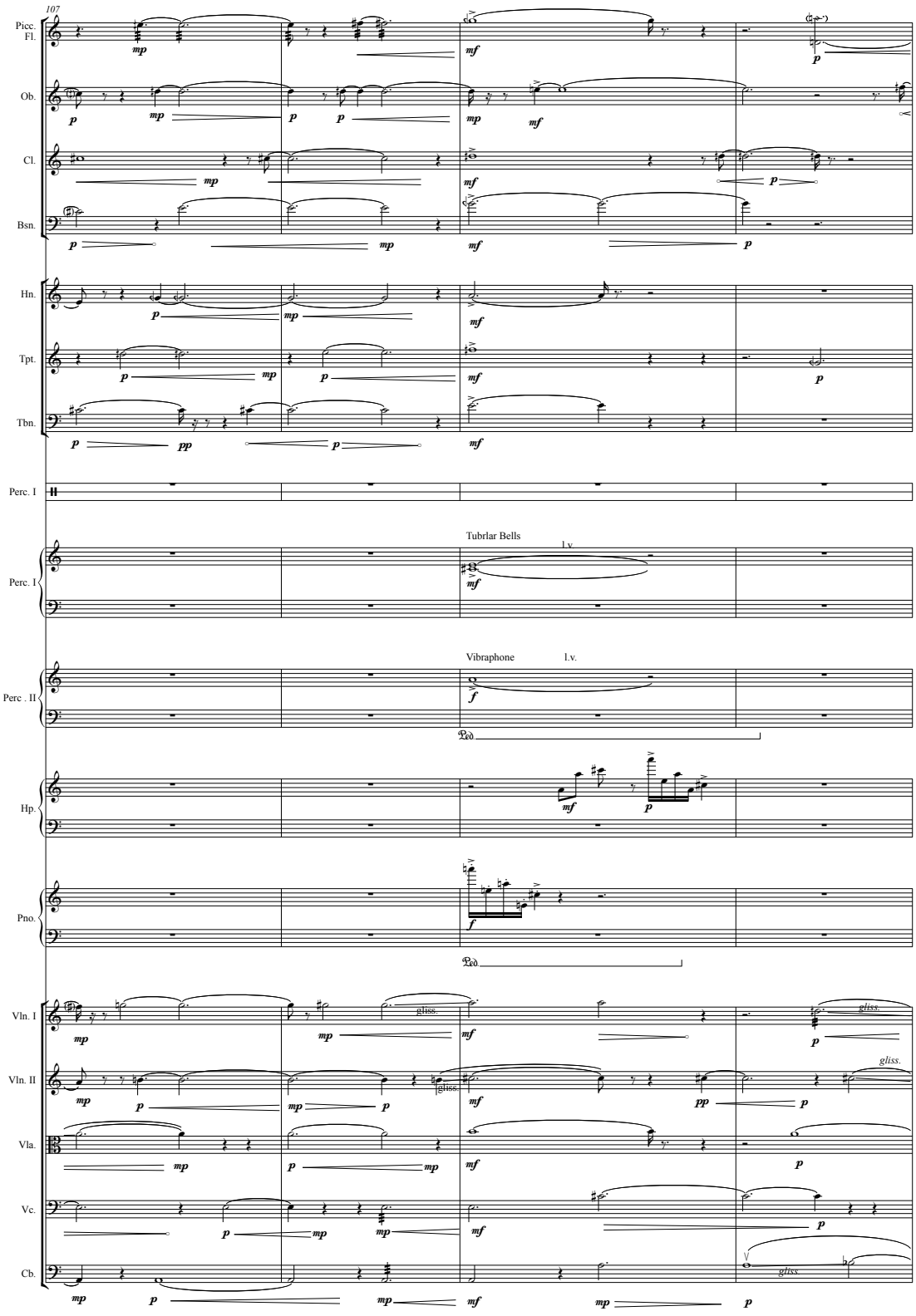


Figure 49 From bar 97 to bar 110 in the fourth section

The harmonic pitches are added more frequently while inharmonic pitches are removed gradually. For example, the inharmonic pitches such as the pitches F and D ¼ sharp in the flute and oboe parts are positioned in bar 97 whereas a harmonic pitch is added continuously in different instruments after bar 98. Also, the pitch A in the double bass part is added in bar 98, the pitch E in the cello part in bar 99 and the pitch A in the bassoon part in bar 100 sequentially. In this manner, I decided to translate the vertical sound increasingly from a dissonant and dark state to a more consonant and light state. This process of the transformation of sound in a vertical structure can be seen to reflect the colour change from darkness (Yin) to lightness (Yang) and the alteration of opposite energy from negative to positive energy of the philosophy of *Yin-Yang*.

To expand the concept of the philosophy of *Yin-Yang* in the piece, I also explored distorted and inharmonic sounds in the last section. For example, the inharmonic multiphonic sounds in the woodwind part and a strong plucking technique in the harp are used. In this manner, the music begins from the harmonic spectrum derived from the low pitch A in the first section and ends with inharmonic sounds showing a structural trajectory from clarity to distortion and noise throughout the whole structure of the piece.

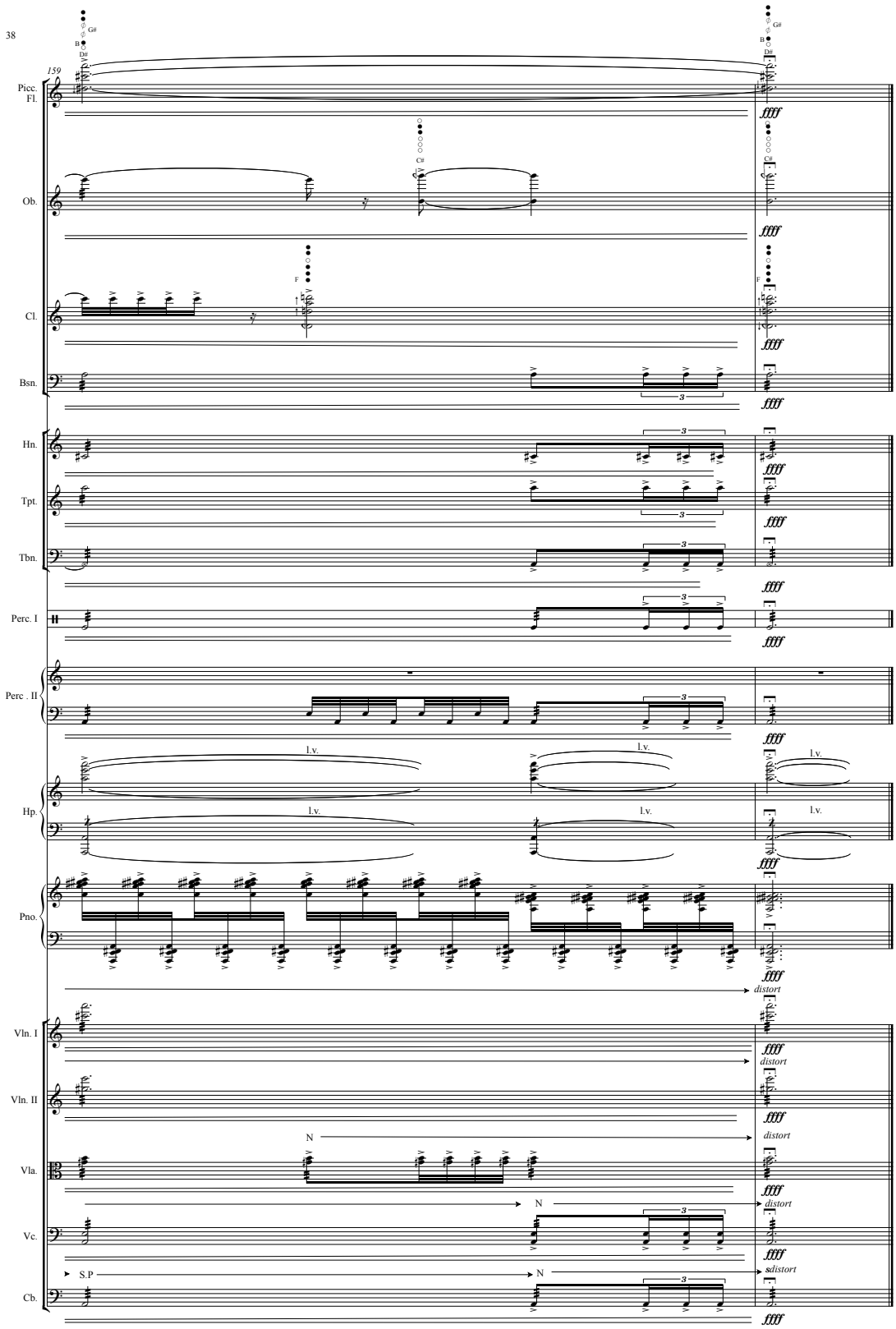


Figure 50 The last section of *The Journey of the Sun*

2.7. Clouds, Landscape, Human Being (2012)

Colouds, Landscape, Human Being for flute, clarinet, violin, cello and piano symbolises the life of a cloud, the landscape and human being under the cloud; for example to form a big cloud, small clouds are combined, and then the big cloud gradually separates into smaller clouds again with a delicate pattern in the sky. The process of the formation of the clouds is a constant series of clusters and separation, which I express through various means in the piece.

In the first section, this process of the formation of the clouds is expressed with the central pitch C# and many instrumental techniques such as use of breathy sound and lip glissandi in the woodwind part as well as *col legno* and circular bowing techniques in the string part. The combination of many different techniques allows for a palette of subtle changes of timbre focussed on the pitch of C# in the different instruments.

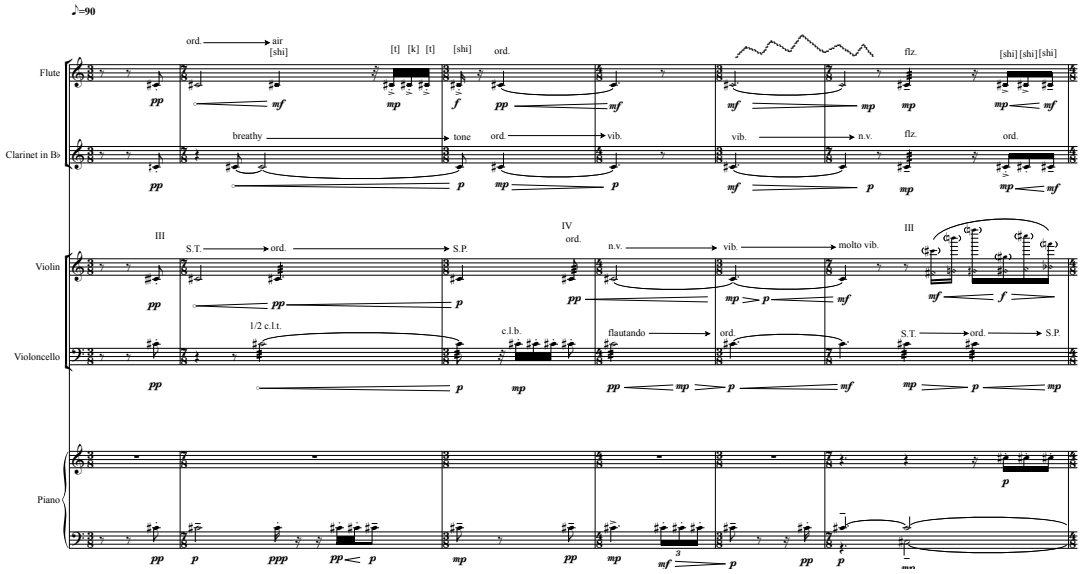


Figure 51 The first section in *Clouds, Landscape, Human Being*

The subtle change of timbre can be also seen in the piano part in the fourth section. I used three different sounds of the high pitch G: one is a muted sound with maximum pressure applied; another one is a mute sound with half pressure, and the

last one is a sound without mute. The alteration of these three sounds generates the slight change of timbre based on the high pitch G.

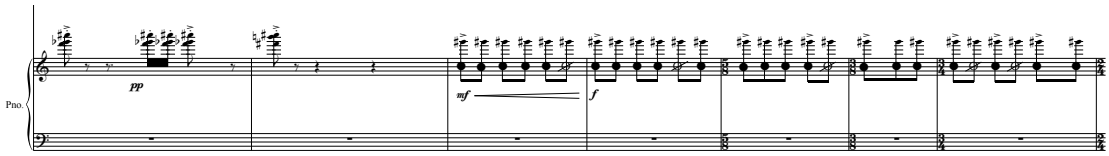


Figure 52 The subtle change of timbre in the piano part in the fourth section

The second section reflects the formation process of the small clouds, which are split from the big cloud. To express this formation, I utilised whistle-tones in the flute part, harmonics in the string, and the notes of the high register in the piano part.

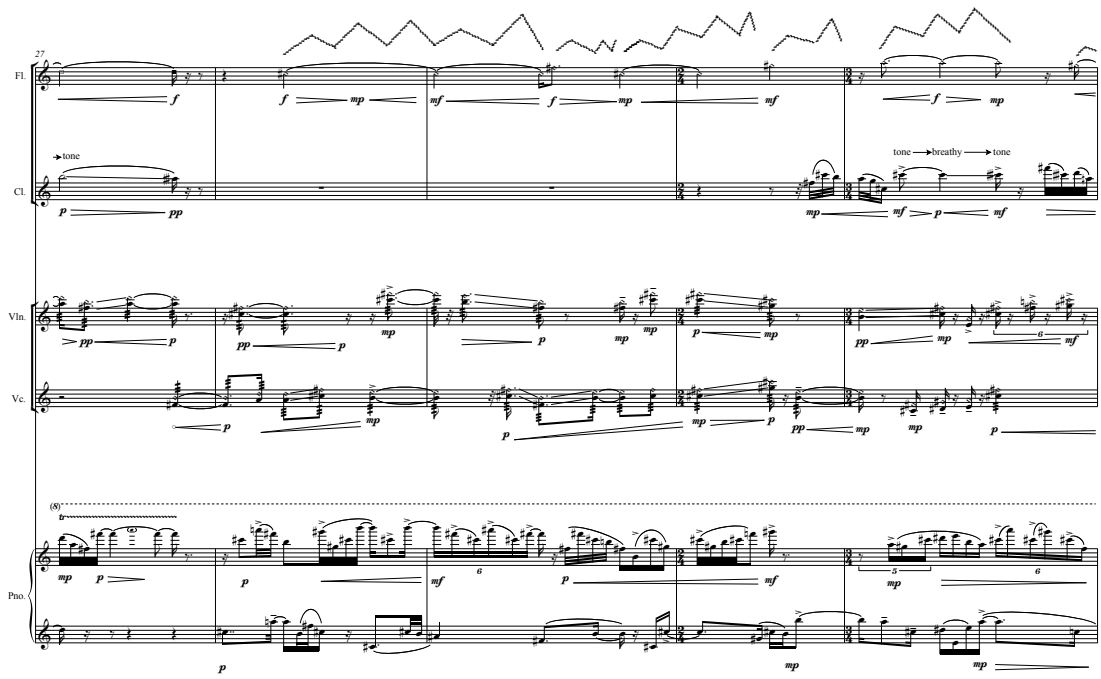


Figure 53 The second section in *Clouds, Landscape, Human Being*

The third section and the fourth section reflect the landscape and Human Being under the clouds and many varied dynamic gestures, rhythms, and instrumental techniques such as pizzicato and key clicks in the woodwind part are employed.

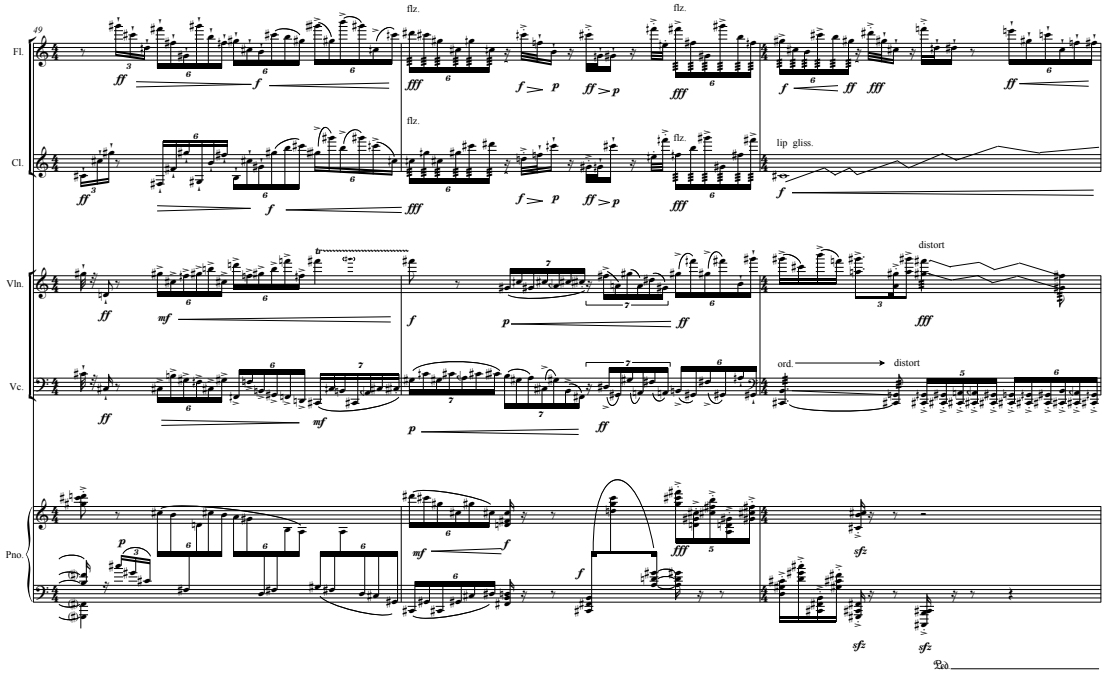


Figure 54 The third section in *Clouds, Landscape, Human Being*

Finally, the fifth section symbolise the shape of the unified cloud again and here, veiled and diluted timbres such as air sounds in the flute and a fluctuation between the sounds of ordinary notes with half-depressed- and full-harmonics in the violin part.

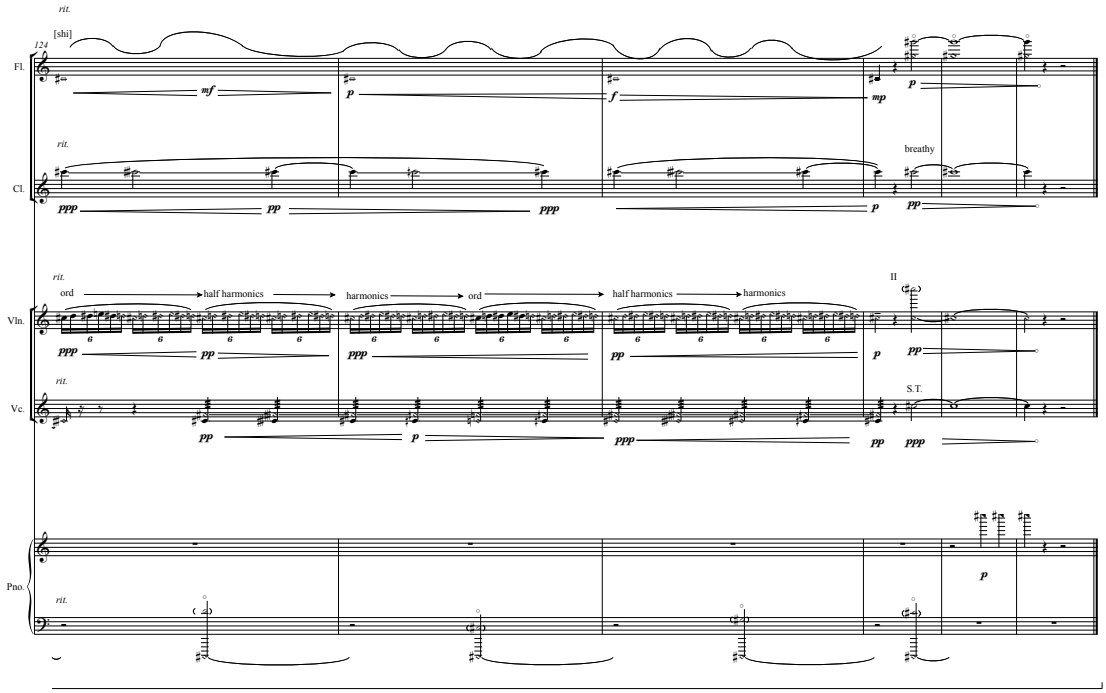


Figure 55 The fifth section in *Clouds, Landscape, Human Being*

Clouds, Landscape, Human Being is similar to other pieces in regard to being composed of several sections, which have different characters. However, the next piece *Four Seasons of Jogakbo* for solo baritone saxophone is different. *Four Seasons of Jogakbo* will present how directly the shape of the scraps in *Jogakbo* and the Korean philosophies are applied into the piece as central concepts of the piece.

2.8. Four Seasons of Jogakbo (2012)

In my composition *The Four Seasons of Jogakbo for solo baritone saxophone,* I pursued musical analogies directly for the philosophies of *Yin-Yang*, *Ohang* and *Maek* as well as the colour of the scraps in *Jogakbo*. The fundamental concept for this piece, to explore the invisible flowing energy of *Maek* and the achievable synergy between musical elements and fragments, is accomplished through the composing of the piece with five fragments and colours; each fragment reflecting the correlating quality of its season and each colour representing its role in accordance with the philosophy of *Ohang*. To express different qualities of seasons and colours, the saxophonist performs each fragment featuring techniques unique to the saxophone in designated areas of the stage. The resulting movement between areas on the stage allows for *Maek* to be introduced to the piece, as having the performer move around the stage represents the invisible energy flow of *Maek* between each of the seasons.

First, to produce the character of *Jogakbo*, I translated the shapes and colours of the scraps used for *Jogakbo*, as well as the process used for creating *Jogakbo*, into the musical materials used for the piece and also as the basis for forming the piece's structure. For example, the scraps of *Jogakbo* are from worn-out fabric and quilts, which are then cut in an irregular fashion allowing for an abundant variety of shapes and colours for the scraps. The seamstress positions these different types of scraps on the fabric and although she does not have an exact mathematical or analytical plan for placing the scraps, she uses guidelines based on

tradition for placing the scraps on the fabric and also for dividing the space of the fabric. In this manner, the skill of the seamstress for creating the *Jogakbo* allows for the handcraft art to be provided with an irregular division of the space featuring different colours of the scraps. To apply this character of *Jogakbo* to the piece, I created forty segments for the first four fragments (note that the fifth fragment *Yellow Four Seasons* does not feature these specific segments), and then placed ten segments in each of the fragments. To reflect the different shapes featured by the scraps of *Jogakbo*, I generated different meters and gestures for the segments including: ascending and descending lines, leaping gestures, and multiphonics. Additionally, I used specific timbres derived from saxophone techniques to show the different colours in the sound. In this manner, each segment has its own shape and timbre resulting in every segment having its own unique character. After composing the segments, I positioned these segments on the score so that an irregular division of the space on the score would be created, and this irregular division allows for the shape of *Jogakbo* to be experienced visually in the score.

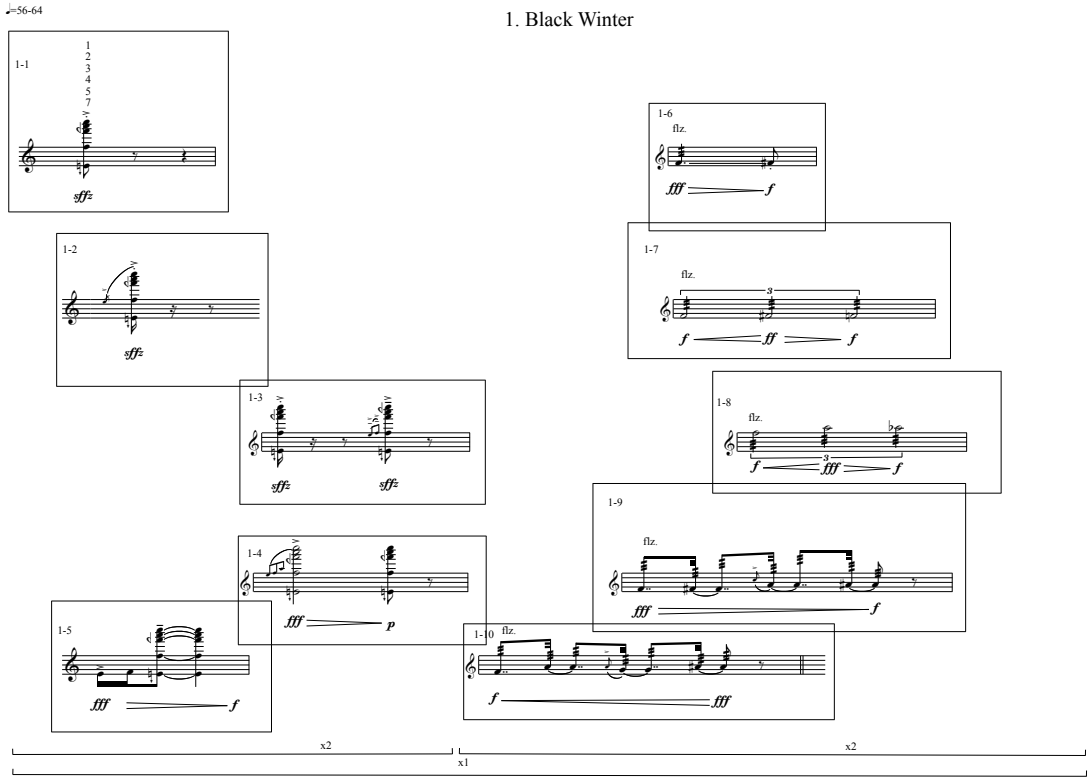


Figure 56 The segments and the irregular division of the space in the first fragment *Black Winter* in *Four Seasons of Jogakbo*

Second, the philosophies of *Ohang* and *Maek* are explored in the piece. *Ohang* is composed of the five elements that form the universe: water, fire, wood, metal, and earth. In-Chan Park, in his article 'The Approach of Human Sensibility Measurement based on The Cosmic Dual Forces and The Five Elements', describes the interaction between the five elements: the Producing Cycle: wood fuels fire, fire leaves behind ashes that become earth, earth protects metal found within the earth, metal allows for condensation and the production of water, and water nourishes wood (1998, p.36). In order to maintain a harmonious balance of the universe, these components not only influence each other but also, following the aforementioned cycle, self-regulate each other. In other words, the universe has a creative and sustainable system that is maintained through the circulation of these five elements. Therefore, the concept of *Ohang* is not just that the basic five different elements

compose the universe but also that the circulation of elements described in *Ohang* enables the universe to exist with a harmonious balance.

I applied the system of cycles featured in *Ohang* to the development of my musical form. In the piece *Four Seasons of Jogakbo,* I devised the performer's movement through reproducing the cycle of the five elements. For example, the designated north area of the stage symbolises the element of water, and the designated east area represents wood while the designated south area of the stage symbolises the element of fire. In this regard, the performer moves from the designated north area on the stage to the designated east area and also from the designated east area to the designated south area. In this manner, the performer's journey between fragments symbolises the system of cycles of *Ohang*. Additionally, to identify the character of each fragment, I utilised additional components of the philosophy of *Ohang*; for example, I used not only the five colours and elements composing the universe but also the four seasons and five directions. *Ohang* includes the following: the four seasons: winter, spring, summer, and autumn; the five colours: black, green (or sometimes blue), red, white, and yellow; and includes the five directions: north, east, south, west, and centre. Figure 57 shows the different components of *Ohang*.

Elements of the Universe	Water	Wood	Fire	Metal	Earth
Colour	Black	Green(Blue)	Red	White	Yellow
Season	Winter	Spring	Summer	Autumn	Four seasons
Direction	North	East	South	West	Centre

Figure 57 A variety of components of *Ohang*

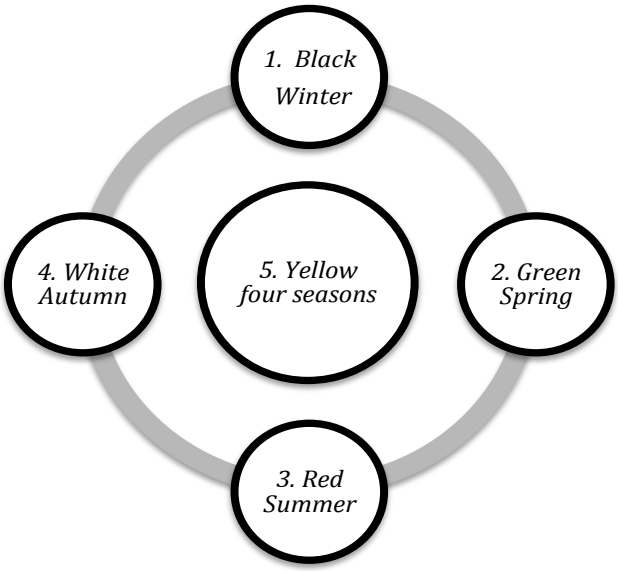


Figure 58 The fragments' position of the stage

Four seasons of Jogakbo reflects these components of *Ohang:* the first fragment is performed at the designated north part of the stage, and expresses the qualities of the colour black and the season winter. For example, the colour black is explained as: "something burnt out, like the ashes of funeral pyre, something motionless like a corpse" (Kandinsky, 2010, p.61). Moreover, winter, the most frigid season of the year, may feature an abundance of snow and many animals choose this season to hibernate and preserve their energy resulting in life forms that are immovable or sleeping in one place. In this regard, the first fragment expresses the coldness, stillness, and the seriousness and darkness or otherwise stark nature symbolised by the colour black and season of winter. As can be seen in figure 56, I utilised multiphonic sounds and the flutter tonguing technique combined with forte dynamics. The reason being that this combination of the technique and dynamics generates a dense sound with a high level of amplitude, which may be perceived in a sense very much akin to Kandinsky's description of the colour black. Furthermore, to follow the limitations of the immobility and motionlessness of winter, I limited the intervals within the segments to semi-tones, half-steps, and thirds.

The second fragment is performed at the designated east part of the stage, and reflects the qualities of the colour green and the season spring. The colour green is considered: "… restful, soothing, cheerful and health-giving. Green is thought to relieve stress and help heal… Green has long been a symbol of fertility" (Wagner, 2009, pp.5-7, cited in O'Connor, 2011, p.231). Furthermore, spring, the season of fertility and warm weather, when plants begin to sprout or bloom and many animals give birth, only further reinforces the perception of vitality and fertility emitted from the colour green. For these reasons, I decided to compose sounds that may be representative of this vitality and fertility through the usage of multiphonics that are softer in amplitude and more palatable in contrast to the multiphonics previously heard in winter, and also by evolving the limited intervallic gestures from the fragment of winter to more playful leaping gestures with intervals of 7ths and 9ths featuring staccatos.

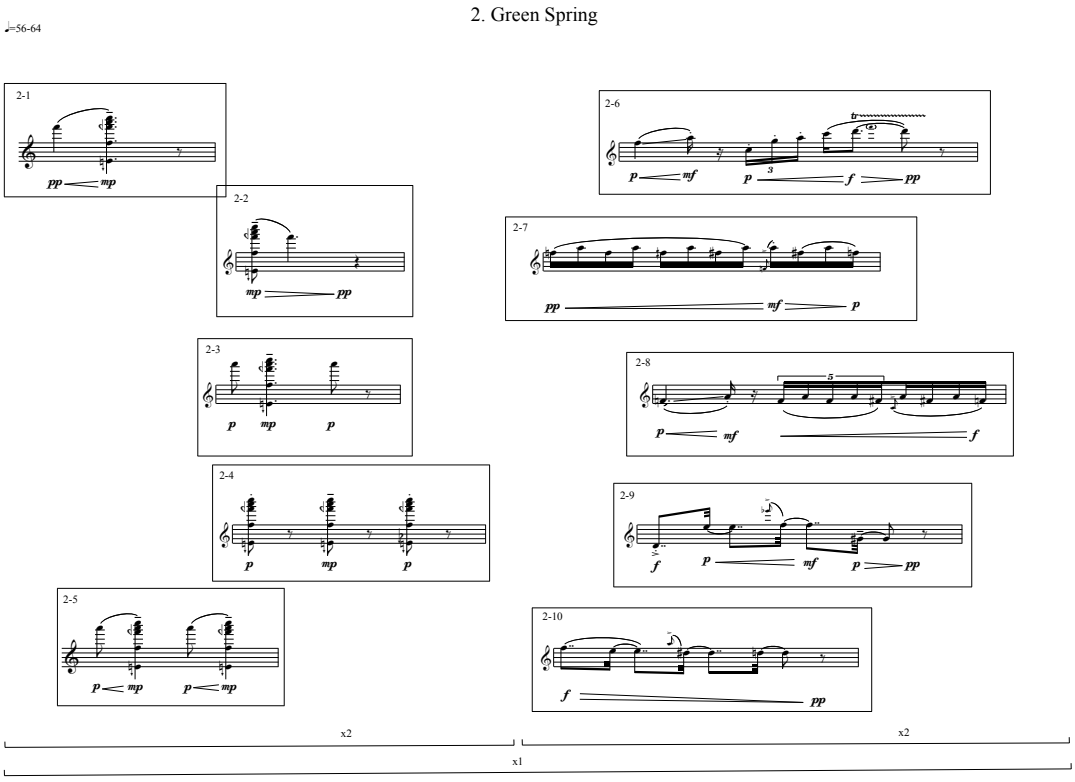


Figure 59 The second fragment *Green Spring* in *Four Seasons of Jogakbo*

The third fragment is played at the designated south part of the stage and reflects the properties of the colour red and the season summer: ‘‘Red . . . is stimulating and energising... Red is energising and excites the emotions” (Logan-Clark and Appleby, 2009, p.10, cited in O’connor, 2011, p.231). Moreover, summer, the hottest season of the year, is an exciting and active season that is full of motion. For example, many people go to the beach or go on a picnic and people enjoy active sports such as swimming and water-skiing during the summer. In this regard, I decided to compose sounds that may reflect the excitement and motion represented by the concept of the colour red and the season of summer through accented staccato material utilising percussive effects on the saxophone such as the slap tongue and key clicks.

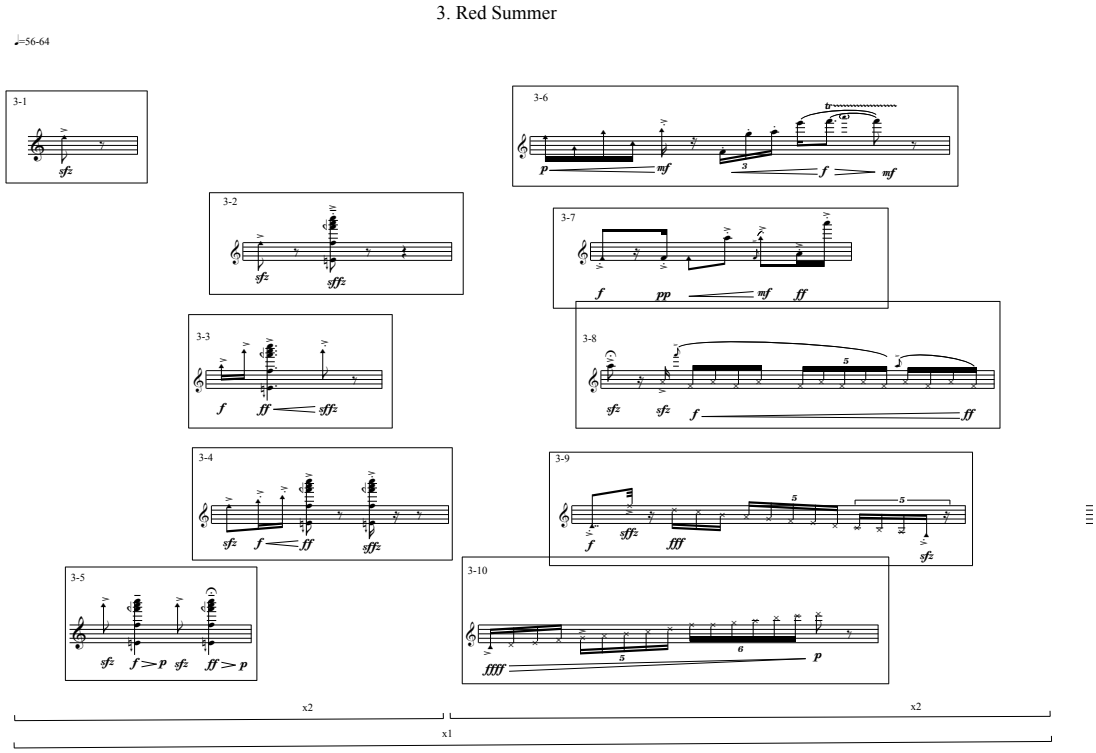


Figure 60 The third fragment *Red Summer* in *Four Seasons of Jogakbo*

The fourth fragment is performed at the designated west part of the stage, and describes the qualities of the colour white and the season autumn. According to Richard Colyer in ‘Thoreau's Color Symbols’, American Philosopher Henry David Thoreau used white "to symbolize purity and spirituality" (1971, p.1001). Also, white is expressed as a light colour and has the “harmony of silence” (Kandinsky, 2010, p.61). Autumn features the transitional period from warm to cold weather and is commonly identified as the season of the harvest. Additionally, I think of autumn as a period in which the plants and the landscape may appear bare. I reflect these qualities with sounds that are less dense and segments featuring the techniques of air sounds and phonetics.

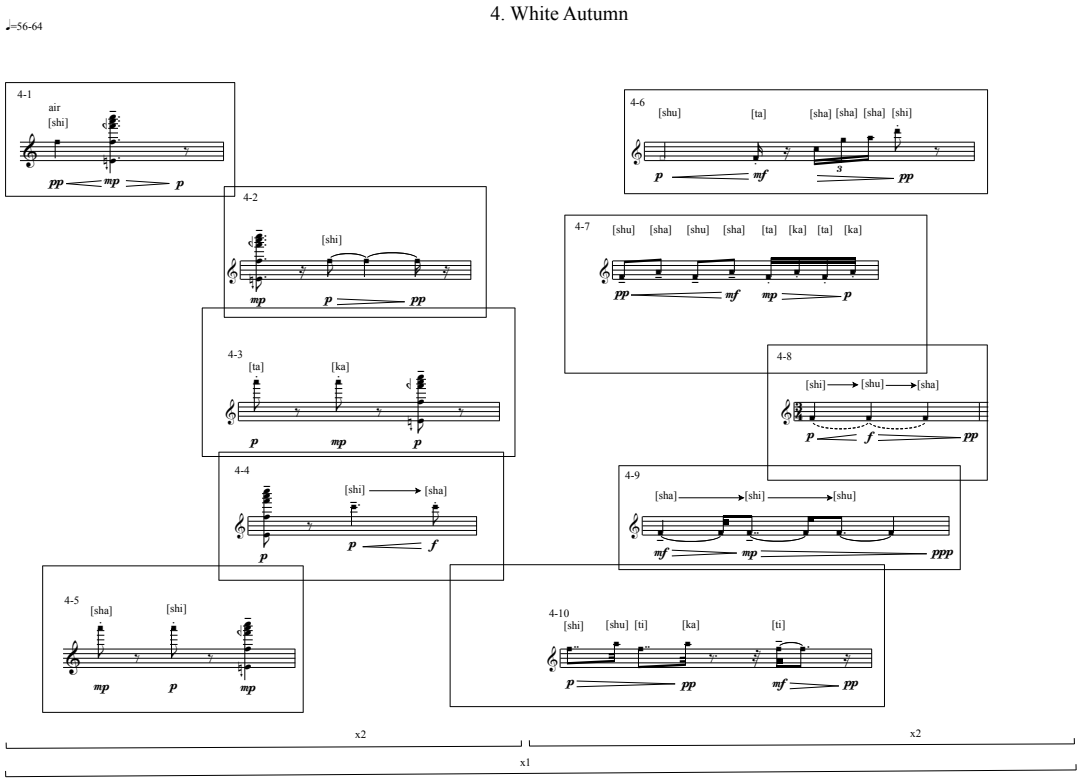


Figure 61 The fourth fragment *White Autumn* in *Four Seasons of Jogakbo*

The fifth fragment is performed at the designated centre of the stage. In this fragment, I chose to focus more on the direction of “centre” as opposed to the colour of yellow given that according to the philosophy of *Ohang*, the centre features the combined sum of qualities from all four of the directions. This combined sum of qualities is very significant from a composition viewpoint as it lends an organic conclusion to the structure of the piece. Thus, I used all forty segments and all the saxophone techniques of the previous four fragments in the fifth fragment, in an attempt to reflect the combined sum of the musical material featured in the first four fragments.

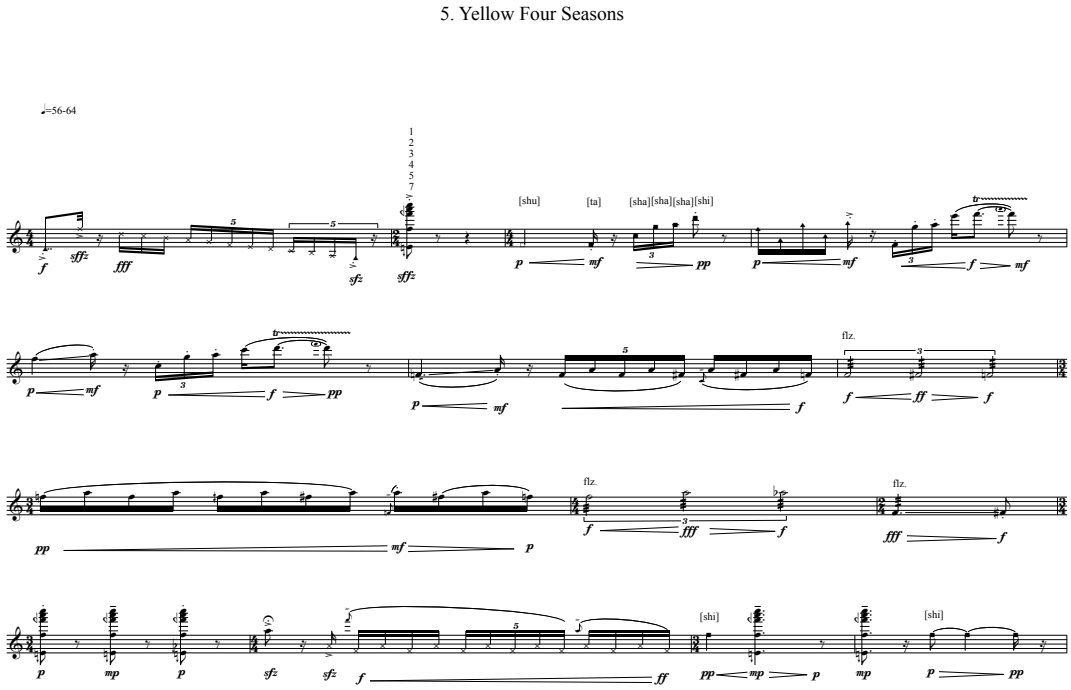


Figure 62 The fifth fragment *Yellow Four Seasons* in *Four Seasons of Jogakbo*

To summarise with regard to how the philosophy of *Ohang* influenced the form of this piece, each of the piece's five fragments is played in a different area of the stage and has its own sound quality. Furthermore, although each fragment has its own character, the fragments are related to each other through the use of common musical materials including multiphonics and rhythms. To best follow the law of *Maek*, and to help symbolise its invisible energy flow, the performer is asked to move between the areas of the fragments resulting in a visualisation of *Maek.* Accordingly, we can witness *Maek* in both temporal and spatial aspects between the fragments.

After determining each of the perceived psychological effects for the saxophone's techniques as well as the perceived psychological effects for each season and for each colour with the purpose of composing the five fragments, I needed to decide the order to perform the segments in each fragment. To determine this order, I applied the philosophy of *Yin-Yang* to the structure of the piece. To explore the philosophy of *Yin*-Yang, I considered how musical materials used for my composition might best feature the relationship of *Yin-Yang*. As I mentioned previously in section 1.2, I applied the philosophy of *Yin-Yang* to my compositional process with the idea that while opposing musical materials (consonance and dissonance, sound and silence, etc.) may exist without their counterparts, they may however be best defined when placed together. In this regard, I attempted to implement this philosophical approach into my musical language and to apply the philosophy to the musical parameters of the piece *Four Seasons of Jogakbo*.

First, in my compositional process, I matched musical materials with the *Yin-Yang* philosophy by featuring segments that are both horizontal and vertical. The first four fragments of the piece consist of ten different segments categorised into two groups; one group featuring sounds of a vertical nature and the other group featuring sounds of a horizontal nature. Each group is composed of five segments, each with its own structure of notes and timbres. To generate sounds of a vertical nature in the

piece, I composed a multiphonic sound with different rhythms, dynamics, and articulations. For example, the multiphonic sound is played with a quaver rhythm, staccato, accent, and sforzando, so that the multiphonic sound generates a strong impact and a loud sound. Another multiphonic sound is played with a minim rhythm and decrescendo, so that the multiphonic sound changes slowly from loud to quiet throughout the duration of the minim. In this manner, each multiphonic sound has a different character. These five segments are positioned on the left side of the score. The segments, which feature sounds of a horizontal nature, such as ascending and descending lines of pitches and a repetition of notes, are placed on the right side of the score. This placement of the segments on the score shows the opposite functions of the vertical and horizontal sounds in a visual manner that is symmetrical with the visualising of the opposing nature of *Yin-Yang.* To further reinforce the vertical and horizontal natures of the sounds, I first isolated the vertical multiphonic sounds to enable the piece to truly feel and sound vertical before introducing the segments with the sounds of a horizontal nature. For example, in Figure 56, the segments with the number from 1-1 to 1-5 generate a vertical sound. These components are performed twice regardless of any order. After this performance, the horizontal materials, which are from 1-6 to 1-10, are performed twice in the same way. Accordingly these performances demonstrate the opposing qualities of vertical sound and horizontal sound.

It is also important to note that while the order of the segments allows for the representation of the opposing nature in the philosophy of *Yin-Yang,* I also desired to reflect the complementary nature of the philosophy. To best accomplish this feat, I categorised the sounds of a vertical nature with sounds that feature an increasing energy and conversely I categorised the sounds of a horizontal nature with sounds that feature a decreasing energy. The categorisation of vertical sounds with increasing energy is accomplished by using sounds that feature a strong pulse for the sounds of a vertical nature, so the sounds are more focused and heavier and for

this reason, the sounds of a vertical nature generate increasing and expanding energy. Conversely, the sounds of a horizontal nature are lighter and softer and feature a very weak pulse or no pulse and result in weak and decreasing energies. And so after the performance of the two groups of segments, a balanced and harmonious approach to the materials of the two groups is enabled by asking the performer to play each segment once with the idea that the interweaving of the segments, both horizontal and vertical, would cancel each other's energy flow and allow for a neutral energy flow to be created, one with a more harmonious feeling. Thus, the segments are performed each once from 1-1 to 1-10 without any specific order. This balanced approach to the performance of the materials from the two groups reflects the complementary function of the philosophy *Yin-Yang* because harmony, in the context of *Yin-Yang,* is symbolised by the reading of both the vertical and horizontal segments in a manner where their energies are neutralised. In this regard, the performing order of materials follows the philosophy of *Yin-Yang*.

The second method I used to explore the philosophy of *Yin-Yang*, also inspired by *Jogakbo,* is the interaction between the performer and composer, specifically with the intention of giving the performer a more equal role in the control of the order of the pieces segments and with regards to the process of how *Jogakbo* is created, relying specifically on the performer's intuition for the explicit purposes of controlling the order of the piece's segments. When a seamstress creates *Jogakbo*, using guidelines derived from the tradition of *Jogakbo,* the seamstress relies in large part on her intuition for positioning the scraps. I applied a similar approach to the creative process in this piece and ask the performer to fulfil the role of the seamstress and rely on his or her own intuition in choosing the order of the segments. From the first to the fourth fragment, the performer should choose the order of segments to play. However, as the composer, I also share in the role of the seamstress for the last fragment and choose the order of the fragment's forty segments. In this manner, the music allows for an almost equal responsibility to be

placed on the intuition of both the performer and composer in effect reflecting the very balance represented in the philosophy of *Yin-Yang*.

The last method I used to experiment with the philosophy of *Yin-Yang* was the combination of sound and silence. After completing the performance of each of the first four fragments, there is a silence as the performer moves to another designated area before playing the next fragment. This 'choreography' of both sound and silence allows for the audience to experience the opposite properties of sound and silence. The philosophy of *Yin-Yang* becomes part of the theatre of the piece.

To summarise the composition of *Four Seasons of Jogakbo*, this piece was a challenge for me because it called for a deeper philosophical and aesthetic approach to the process of composition. I applied not only musical materials inspired by the craft of *Jogakbo* but also the components derived from *Ohang* into the piece. Additionally, the philosophies of *Yin-Yang and Maek* are reflected in various ways in the piece. In the next chapter 'Snow Baby in Graz', I will discuss how my use of the different colours of *Ohang* is further developed and how the concept of "sound colour" is used in the piece.

2.9. Snow Baby in Graz (2013)

In the piece, *Snow Baby in Graz*, I focused on exploring musical structure and form in relation to the patching technique of *Jogakbo*, with regard to the relationship between the colours of the scraps of *Jogakbo* and the colours of the horn's various techniques. First, I juxtaposed the bars so that each bar has its own different musical timbre and character allowing for the connection of bars to produce a sequence of different sounds or musical timbres like the colour spectrums of *Jogakbo*. Moving on, I connected sections that have different musical timbres and characters side by side and, through this process, I expected that the change of section by musical timbre and "sound colour" could be perceived. Next, I explored the common language between the colours of the scraps of *Jogakbo* and the colours of the horn techniques.

In order to connect the visual colours of the scraps of *Jogakbo* and the colours of the horn technique, I explored the “sound colour” perceived by a range of horn techniques, with special focus on percussive sounds and stopped horn sounds. The techniques may generate a variety of “sound colours”.

To create delicate changes of timbre in my musical structure, I utilised different horn techniques; for example, the stop mute is applied in the first section. John Ericson discusses the function of stop mutes: “Transposing brass stopping mutes are also manufactured to be used as a substitute for hand stopping. These do produce the correct tonal color and also allow for the production of more volume than hand stopping” (Ericson, 2010). There is a hole at the bell of stop mute, so opening and covering the bell’s opening generates the timbral differences of notes. (see figure.63) Applying the stop mute, as opposed to allowing the horn player to use their hand to stop the horn, allows for the generation of a weak, faded, and light sound.

Figure 63 Stop Mute and Straight Mute
(Ericson, 2010)

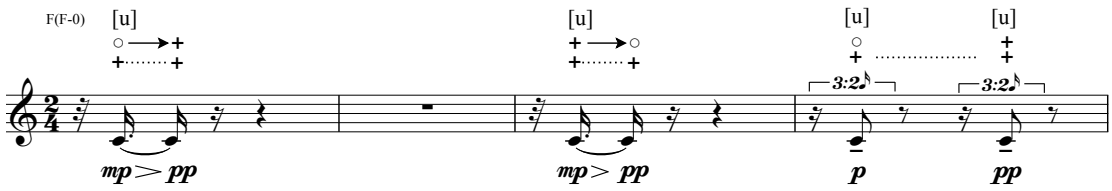


Figure 64 *Snow Baby in Graz* in bar 1-4

In Figure 64, the written pitch C, which is a sounding F, is employed with a stop mute and the 'u' vowel sound. The symbol '+---+' means 'with stop mute', and 'o' and '+' symbolise 'opening and covering of the bell's opening on the stop mute'. Therefore, 'o—>+' describes the transition from the opening of the stop mute bell to the covering of the stop mute bell. In bar 1, the change of the technique from open to covered changes the shade of the sound from a light and loud sound to a dark and soft sound, and so generates the subtle change of "sound colour" I sought. This change of timbre seems to me like the slight change of visual colour from white to cream or from white to ivory in the *Jogakbo*. Additionally, by changing the vowel formed by the horn player's embouchure, a further subtle change of "sound colour" is produced. I use several vowels such as 'u', 'a', 'o' and 'ich' to explore changes of "sound colour". The change of the vowel from 'u', 'a', 'o', to 'ich' distorts the sound to become higher and lighter. These vowel sounds amplify through the horn's tubing, so the change of vowel sound can be perceived clearly. To further explain this process, I will introduce "Source-Filter": a theory of Wayne Slawson.

Wayne Slawson discusses the "sound colour" of vowel sounds by using the "source-filter" theory, which states that if the sources are the same but the filter is different, the resultant sound will be different.

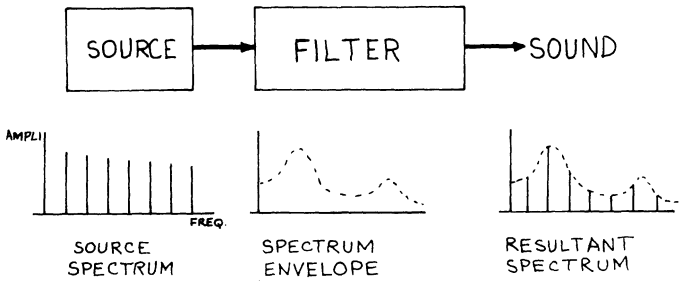


Figure 65 “The source-filter model of sound production”

(Slawson, 1981, p.133)

Figure 65 shows the process of “sound production”. Slawson describes “source” and “filter” in relation to the production of speech:

> In vowels the excitation is generated by the vocal folds in the larynx; the filter is the throat and mouth. The tension of the vocal folds and the volume of air we force through them control the pitch and intensity of the vowel. The shape of the vocal tract controls the vowel quality or color. As we all know, the excitation and the “filter” in vowels are independent. We can utter a soft, low-pitched [a] or a loud, high-pitched [a] or we can utter an [a] and an [e] at the same moderate intensity and pitch.
> (Slawson, 1981, p.133)

Through Slawson’s research, the process of the production of vowel sound can be understood. Slawson also discusses “several dimensions of sound color” of vowel sound to explain “sound colour”: “Of the several dimensions of sound color, I shall discuss three that seem to be the most salient and musically useful. They are called LAXNESS, OPENNESS, and ACUTENESS” (1981, p.135).

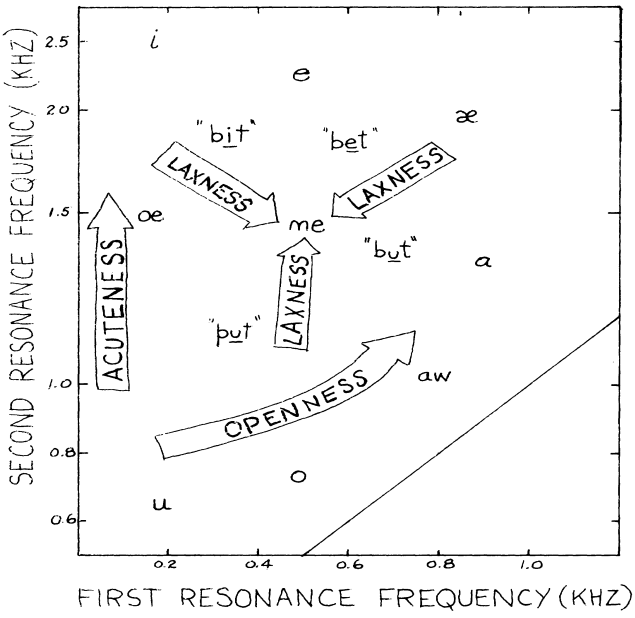


Figure 66 “The sound color space. The dimension of OPENNESS varies roughly with the frequency of the first resonance; ACUTENESS, with the frequency of the second. The middle of the space (at the [ne] sound) is the maximally LAX sound; around the periphery are the least LAX sounds.”

(Slawson, 1981, p.135)

Figure 66 is a graph to show the “LAXNESS, OPENNESS, and ACUTENESS” of vowel sounds. Slawson interprets about the graph:

> As a first approximation, OPENNESS varies with the frequency of the first resonance; ACUTENESS with the frequency of the second. Thus when both resonances are low in frequency, we have the non-ACUTE, non-OPEN vowel, [u]. A high second resonance and a low first resonance produces an [i]-like, ACUTE, non-OPEN sound. A high first resonance with a low second resonances produces [aw] as in “maudlin”- OPEN and non-ACUTE. When both resonances are high, we get the OPEN and ACUTE [ae] as in “bad”. (Slawson, 1981, p.135)

In Slawson’s view, there are different sound colours between vowels. These different sound colours allow for one vowel sound to be distinguished from other vowels. I used this approach to sound colours in the composition *Snow Baby in Graz*.

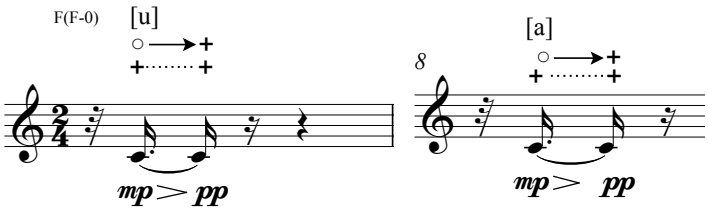


Figure 67 The use of different vowel sounds in bar 1 and in bar 8

As we can see in figure 67, the shapes of bar 1 and bar 8 look similar, but I used the different vowel sounds [u] and [a] in bar 1 and in bar 8 respectively. Therefore, the resulting sounds are slightly different and the "sound colour" is also different between the two bars. For example, the "sound colour" of bar 1 is less open than that of bar 8 which in turn is more open

Slawson discussed further the concept of "equal value contours" for each of vowels:

> I can be more specific about the dimensions by drawing *equal value contours* for each of them. All configurations of the first two resonances that fall on a single contour have the same value with respect to the dimension in question. To locate the contours exactly would demand a good deal of psychoacoustic research, but I can at least suggest what their approximate shapes will be. In Figure 4 are plotted hypothetical equal-LAXNESS, equal-OPENNESS, and equal-ACUTENESS contours.
> Notice that the contours tell us how to hold one aspect of sound color constant while varying other aspects. Suppose for example, we want to hold LAXNESS invariant in the face of changes in OPENNESS and ACUTENESS. We would select one of the equal-LAXNESS contours and then move along it with the proper variations in the resonance frequencies. Similarly we can move along an equal-OPENNESS contour by changing mostly the frequency of the second resonance while holding the first almost constant. In general this kind of transformation produces changes in ACUTENESS and LAXNESS but not in OPENNESS (Slawson, 1981, p.136)

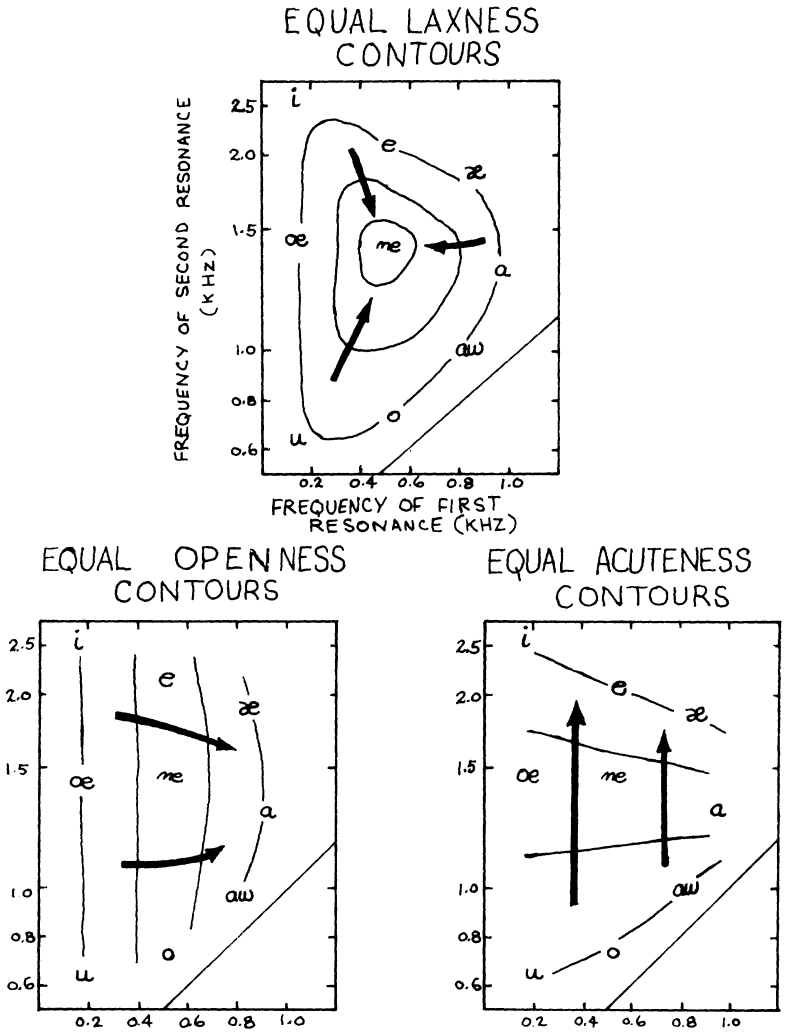


Figure 68 “Figure 4. The dimensions of sound color. Loci of equal value for each of the dimensions of LAXNESS, OPENNESS and ACUTENESS are plotted in terms of the frequencies of the first two resonances. The approximate positions of some representative vowels are indicated. ”
(Slawson, 1981, p.137)

From Slawson’s view, there exists an “equal value contour” between the vowel sounds in the frequency of the first two resonances and this “equal value contour” produces the transformation of “sound colour”.

This transformation of “sound colour” can be seen in *Snow Baby in Graz*. For example, in bar 9-10, it can be seen that the transition of the vowel sound from [u] to [a] and [a] to [o] along with the covering and opening of the stop mute allows for a

transformation of “sound colour” to occur from closed to open in OPENNESS.

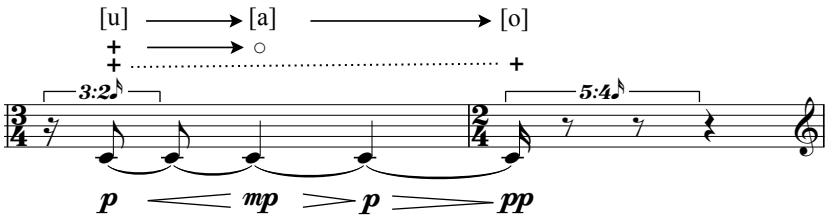


Figure 69 “OPENNESS TRANSPOSITION” in bar 9-10 in *Snow Baby in Graz*

I also changed the vowel sounds between [o] and [ich] ” in bar 17 and between [ich] and [u] in bar 89-90. The change of the vowels allows for a transformation of “sound colour” to occur from ‘‘non-ACUTE” to “ACUTE” in ACUTENESS.

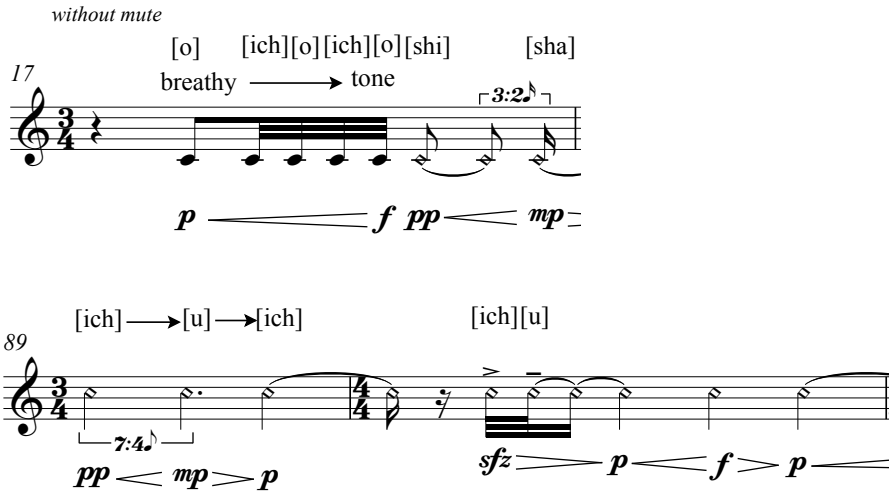


Figure 70 The transformation of “sound colour” in “ACUTENESS” in bar 17 and in bar 89-90

In this manner, I explored slightly different changes of timbre and “sound colour” in each bar or between bars structurally in *Snow Baby in Graz*. I applied these changes of timbre and “sound colour” to musical form with greater depth in *Snow Baby in Graz*. For example, I explored changes in the timbre and “sound colour” between sections. This transition of sections is similar to Grisey’s approach to the

musical form. Grisey states:

> What we see is not the musical entity as such but instead its evolution. We are unable to measure the pitch, the duration or the intensity of a given sound, however we immediately sense the difference in between one sound and the previous one. I no longer seek to compose an entity, but instead the transition from one to another, or of one structure to another; this is what I call the degree of change. (Grisey, 1974c, p.224 cited in Féron, 2011, p.351)

Grisey describes the flow of sound as "the transition from one to another, or of one structure to another" and this transition can generate "the degree of change". Therefore, in Grisey's music, it is not necessary to develop a motive for all pitch materials. I was influenced by Grisey's musical form and by *Jogakbo*'s form, because of their shared approach to the concept of non-developmental form. With this approach in mind, I developed the musical form in *Snow Baby in Graz*.

First, I examined the horn's techniques by focusing on investigating its percussive sounds and stopped horn techniques to seek a variety of colourful effects. I classified the techniques by psychological effect based on my own unique perceptions of the colour of each sound. After examining the horn techniques, I catalogued them into ten groups by their perceived psychological effect ("sound colour"). The ten groups I used, which are in turn related to the ten colours of *Ohang* are as listed: white, black, red, blue, yellow, pink, purple, sulfurous yellow, green, and sky. For example, the technique of opening and covering of the stop mute is associated with the colour white, as I perceive the "sound colour" as being pure and light. Additionally, the percussive effects offered by techniques such as the hitting of the mouthpiece with one's palm or kissing the mouthpiece when it is placed in the horn provided an exciting and lively feeling, which I then associated with the colour red. After categorising the horn techniques in this way, the next phase was to create the order of sections using the ten colours and the horn's technique.

I decided the order of ten colours for forming the sections in the piece through the placement of a negative colour between each of the positive colours, according to the philosophy of *Ohang*. For example pink, a negative colour, is generated by a

combination of white and red, so the colour pink is placed between white and red, both of which are positive colours. While purple, another negative colour, is placed between red and black. In this manner, the outcome of the colours' order was the following: white, pink, red, purple, black, sulfurous yellow, yellow, green, blue, and sky.

White	Pink	Red	Purple	Black	Sulfurous Yellow	Yellow	Green	Blue	Sky

Figure 71 The order as related to the ten colours of *Ohang*

The order of sections of the piece being determined by this order of colours, has thus allowed for the composition to feature ten different sections. I focused on the positive colour sections more than negative colour sections, because the positive colours have more increasing and active energy than the negative colours in relation to the philosophy of *Yin-Yang*. To express these increasing, active and progressive energies, I decided to increase the length of each of the positive sections.

As discussed earlier, the first section employs the stop mute to allow for the lightness of the colour white to be perceived. The second positive colour, red, is the focus of the third section using the percussive effects of the horn to express the exciting and lively feeling and nature of the colour red. The fifth section, in turn, is related to the colour black, which for me emits a perceivable energy that is serious and dark. To achieve this energy, I associated it with the colour black, which I produced using the sound of the horn's multiphonics created by the horn player's buzzing the lower pitch while singing the higher partials. (see figure 72) In this manner, the positive colour sections are associated with the psychological property of visual colour and sound colour of the horn's technique.

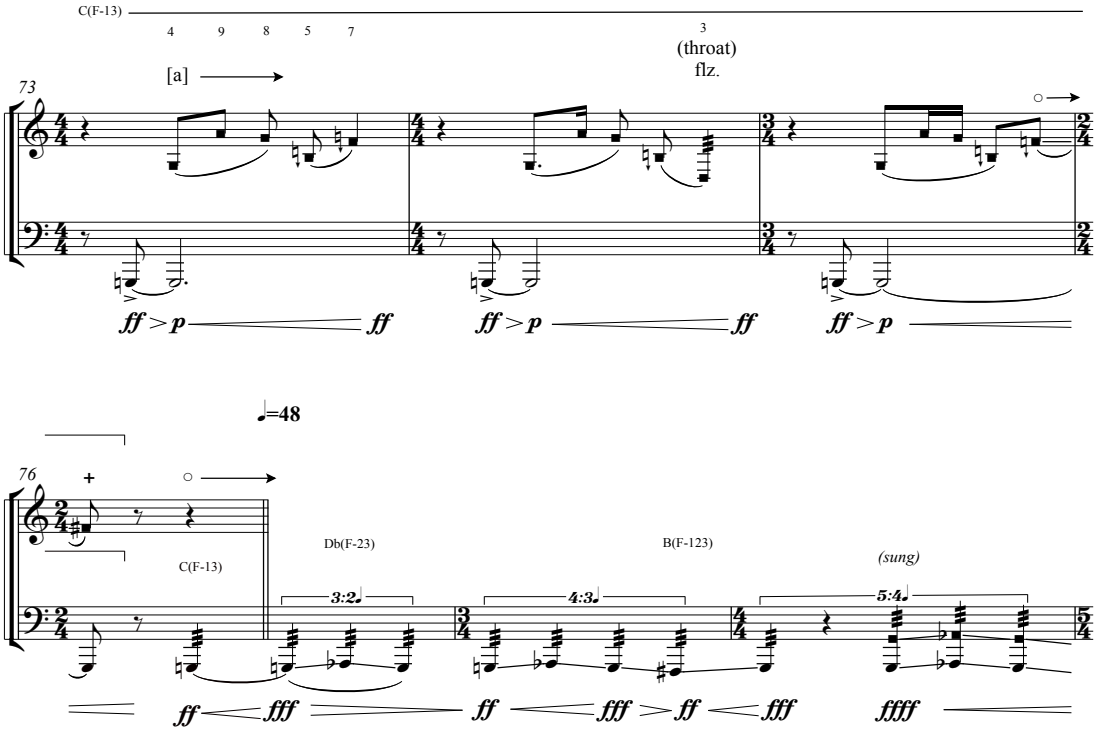


Figure 72 The fifth section featuring the colour black in *Snow Baby in Graz*

On the other hand, sections formed from the derivation of negative colours, pink, purple, sulfurous yellow, green and sky section are composed of a mixture of the "sound colours" from their adjacent sections. For example, the second section consists of ½ valve trills and glissando techniques. The ½ valve trill technique produces a soft and light sound reflecting the colour white, while the trill also makes the notes shift quickly into other registers. This fast shift of registers creates a perceivable energy that is exciting and vital and also identified with the colour red. In this manner, the ½ valve trill technique shows the characters of both the white and red colours simultaneously resulting in a creation of the colour pink. (see figure 73)

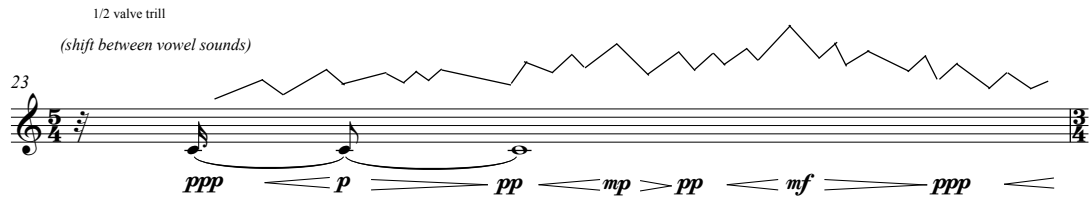


Figure 73 The second pink section in *Snow Baby in Graz*

In this manner, each section of this piece has its specific horn technique matched with one of the ten colours. However, the techniques representing a section may also be found in different places and in this respect the shape of *Jogakbo* influences the musical form of this piece. The scraps sharing the same colour or similar shades in *Jogakbo* are positioned not just in one place but also in different places, and so, when we look at *Jogakbo*, we can follow a colour visually in many different directions. Similarly, in this piece, the horn's techniques illustrating its colourful characters are not only in one section, but also in other sections. Thus, allowing for the music to be not a journey with a singularly straight path but instead a journey that may be experienced as multidimensional, with the flow of music going back and forth between the various horn techniques.

The exploration of musical structure and form in relation to the character of *Jogakbo* and Kandinsky's 'Colour Theory' in my piece *Snow Baby in Graz*, provided the opportunity to match visual colours with horn techniques by their psychologically perceived effect. This exploration plays a significant role in the development of my own musical language.

3. Conclusion

In this commentary, I have outlined the influences and research behind the development of my musical philosophy and compositional language. During my doctoral studies my compositional process evolved through research into the relationship between colour and sound, as well as my research into Korean philosophy and art, in part due to my desire to further explore my cultural background and heritage. In this regard, I researched the art and craft of *Jogakbo* and the Korean philosophies of *Yin-Yang*, *Ohang*, and *Maek*, which are reflected in *Jogakbo.* To elaborate further, within the philosophy of *Yin-Yang* there is an understanding of the relationship between lightness and darkness and this understanding is reflected in my use of musical materials with regards to colour. In this manner, when I compose a change from one pitch to another pitch, I explore the *Yin-Yang* concept by focusing on transformations between seemingly opposing states and showing how they can come into relation. Additionally, when creating my musical structure and forms, I used the character of *Jogakbo* and the philosophy of *Ohang*. For example, I applied my observations of the colour spectra found within the scraps of *Jogakbo* and spatial relationships to the way I dealt with transitions of colour and shape in musical structure and form. My compositions are based on a vocabulary made up of subtle changes of musical timbre using different instrumental techniques. This colour-based placement of the sections and the transitions between the sections are akin to the colour-based placement of the scraps and the transitions between the scraps found in *Jogakbo*. Furthermore, to match the colours of scraps in *Jogakbo* and instrument techniques, I researched the psychologically perceived effects of the colours found in the philosophy of *Ohang* matching these to the “sound colour” of instrument techniques. In this manner, I could more directly apply the shape of *Jogakbo* into my musical structure and form. Additionally the Korean philosophy of *Maek* allowed me to develop a compositional system where creating the flow of sound both in a local

horizontal structure such as between pitches, and in a global horizontal structure such as between sections, would be viable. In this way, the Korean philosophies and the character of *Jogakbo* played a significant role in the development of my musical language.

However, my research into "sound colour" as the primary way of articulating musical structure and form poses further questions and challenges. The techniques and extended techniques of an individual instrument can define 'colours' that I could relate to certain psychological effects of 'warmth', 'coolness', 'calm', 'excitement' etc. But in this manner, it may be difficult to define colour and qualities when a sound is a result of a mixture created simultaneously by many instrumental techniques. I propose to further research how I might define sound by colour when working with sounds created by the simultaneous combinations of instrumental techniques. I wish to further research how I may apply a compositional language based on 'patching techniques' and ideas from *Jogakbo* to formal principles at a larger scale in compositions for large ensembles and orchestras.

I plan to continue my research of extended techniques for the purposes of developing my capacity to compose with subtly different musical colours with the hope that this research will provide me a larger palette of differentiated timbres and subtle colour transitions for my compositional process. This larger palette will enable my musical language and compositional style to continue developing in a manner that I regard as more sophisticated, vibrant and delicate. While the research up until now has been primarily for the purposes of developing a means through which I could develop my own compositional language and structure, researching how to enable listeners of my music to be able to also perceived these philosophies and further perceive the sound-colours could also prove fruitful. The research will also further enable me to see if this compositional technique in relation to Korean cultural thought has the potential to establish my musical form not only in solo instrumental music or small ensemble music but also for larger musical forces.

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