Ever-Changing Fragments

Folio of Compositions

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Music

December 2014

ABSTRACT

Fragments are essential for the realisation of my musical ideas. This commentary explains the musical, aesthetical and philosophical backgrounds to my work, and also the detailed compositional processes employed. Chapter one is a brief overview of *Sigimsae* and *main-tone* as found in traditional Korean music, which subsequently become transformed in my composition through the integration with contemporary Western musical elements. Chapter two analyses six compositions in this folio to clarify how unique sounds and forms are developed and achieved through the ever-changing fragment.

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   Duration: 4'29", Year of Completion: November 2011

   Performances:

   - YOCOCO Concert at the Sir Jack Lyons Concert Hall on 1 March 2012 (Premiere)
       Jenny Green, *Soprano*
       Nils Greenhow, *Tenor*
       Patrick Burnett, *Bass Clarinet*
   - ICMC-SMC 2014 in Athens, Greece, on 19 September 2014
   - INTIME 2014 at the Coventry University, UK, on 19 October 2014
   - International Festival Poznan Music Spring in Poznan, Poland, on 24 March 2015
   - New York City Electroacoustic Music Festival (NYCEMF) at the Abrons Arts Centre in New York, USA, on 22 June 2015

2. *Sanjo* for Solo Viola

   Duration: 16'07", Year of Completion: July 2013

   Performance:

   - Workshop with Richard Jones, Violist of the Ligeti Quartet, at the Sir Jack Lyons Concert Hall on 1 November 2013
   - Composer Chang Seok Choi's Composition Concert at Sir Jack Lyons Concert Hall on 29 January 2016 (Premiere)
       Ching Han Lin, *Viola*

3. *Spacetime* for Flute, Clarinet, Trumpet, Trombone, Percussion, Harp, Piano, Violin and Cello

   Duration: 11'58", Year of completion: January 2014

   - *Spacetime* was awarded the second prize at the 2014 CHENGDU-CHINA 10th SUN RIVER PRIZE Students' New Music Composition Competition

4. *Eolgae* for Symphony Orchestra

   Duration: 17'39", Year of Completion: July 2014

   Performance:

   - Workshop with the University Symphony Orchestra at the Sir Jack Lyons Concert Hall on 13 May 2014
       John Stringer, *Conductor*

5. *Animus* for Flute, Clarinet, Violin, Cello and Piano

   Duration: 11'23", Year of Composition: July 2015

   - *Animus* received the Honourable Mention at the 2015 CHENGDU-CHINA 11th SUN RIVER PRIZE Students' New Music Composition Competition.
   - *Animus* was selected for the S.E.M. Ensemble 2016 Workshop of Reading and Performance of New Works for small ensembles.

Performance:
- Emerging Composers Workshop: Annual Reading of New Works by Emerging Composers with the S.E.M. Ensemble at the Willow Place Auditorium in Brooklyn Heights, New York, USA, on 9 February 2016 (Premiere)
  - Roberta Michel, *Flute*
  - Carol McGonnell, *Clarinet*
  - Conrad Harris, *Violin*
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  - Joseph Kubera, *Piano*
  - Petr Kotik, *Conductor*

6. String Quartet *The Lost Times*

   Duration 17'05", Year of Composition: November 2015

   - Workshop with the Quatuor Diotima at the Department of Music in the University of York on 16 February 2016
     - YunPeng Zhao, *Violin I*
     - Constance Ronzatti, *Violin II*
     - Franck Chevalier, *Viola*
     - Pierre Morlet, *Cello*

   The first movement *Darkness* of *The Lost Times* was read at the workshop and performed at the informal concert after the workshop at the Department of Music in the University of York.

   - Bozzini Lab Vancouver Workshop 2016 on 3–10 May 2016
     - Clemens Merkel, *Violin I*
     - Alissa Cheung, *Violin II*
     - Stéphanie Bozzini, *Viola*
     - Isabelle Bozzini, *Cello*

   The third movement *Memory of Life* and the fourth movement *Bright Light* of *The Lost Times* were read at the workshop and the fourth movement *Bright Light* was performed at the concert at the Djavad Mowafaghian World Arts Centre, Goldcorp Centre for the Arts in the Simon Fraser University in Canada, on 10 May 2016.

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2. DVD: Fixed Video with Live Recording of the Premiere Performance

Track 1	Initium To view this video online, please visit the YouTube link as follows: https://www.youtube.com/watch?v=mQDULcgZIN0	5'21"

See List of Compositions for details of performances

ACKNOWLEDGEMENTS

AUTHOR'S DECLARATION

I declare that the work in this folio including a commentary, six musical compositions, audio recordings (CD) and video (DVD) is my own work, and has not been submitted for examination at this or any other institution for another award.

Introduction: Ever-Changing Fragments

My musical composition is the realisation of imagination, artistic vision and new musical ideas often embedded in ever-changing fragments that contribute to vivid and colourful sounds, rhythms and timbres. My aim has been to transcend any technical and physical limits, and to dare to push myself to the limit in exploring the uncharted territory. In addition, I have aimed to speak of Hope and Light, singing a vitality of life and longing and searching for a true beauty in music as well as a true purpose in life. The ever-changing fragment is the musical and structural basis for musical development in my work, and becomes of the guiding principle of the music as a whole. Through a meticulous and detailed inner structural plan and application, the overall structure of the music becomes a refined form which can be either a shapeless (formless) or a shaped (formed) form. Often associated with traditional Korean musical elements such as Sigimsae (embellishments) and a main-tone technique, ever-changing fragments undergo a rigorous transformation process, integrating contemporary Western musical elements with traditional Korean techniques. These fragments are self-contained and complete, and ultimately become something different from their origins without losing their original characteristics. During this development, new experimental approaches are employed to incorporate fresh ideas in the music. For example, an athematic voice (or part) writing, a liquidation of rhythms, a flow of tension and repose, pulsation, time and space are points of departure for a new musical work, serving as a means to mould and sculpture my own individual sounds.

Chapter I: Sigimsae and Main-Tone

1. Sigimsae

Sigimsae is a musical term for embellishments in traditional Korean music, based on the manipulation of pitch that gives character, shape, and direction to a melodic line through different gestures at various levels, including bending, lifting, pulling down, and undulating pitch. It consists of four types of embellishments including Nonghyeon (or Yoseong), Jeonseong, Toiseong and Chooseong as shown in Table 1. These are not just ordinary ornaments, but the essence of the unique melodic development of traditional Korean music, because, unlike in western music, the concept of harmony is alien to traditional Korean music. Traditional Korean music is based on heterophony. In a narrow sense, Nonghyeon is a performance technique used on Korean string instruments such as Geomungo and Gayageum. Executed by the left hand, it is a technique of decorating tones with different gestures such as undulation, bend, etc., often accompanied with microtones. It largely depends on the performers' capability to execute this technique which shapes the unique characteristic of music. This technique in performance has become the determinant of the genre of music. Moreover, Sigimsae is often associated with a main-tone technique.

Classification	Definition	Example	Remarks
Nonghyeon (or Yoseong)	Vibrato: Undulation Narrow ↔ Wide		Court music: Narrow Folk music: Wide
Jeonseong	Appoggiatura (or acciaccatura): Short embellishment		
Toiseong	Downward glissando (Downward portamento)		
Chooseong	Upward glissando (Upward portamento)		

Table 1. Classification of Sigimsae

2. Main-tone Technique as a Melodic Development

Main-tone technique deeply rooted in Korean court music, was established by Isang Yun, a Korean-German composer who introduced this original style to western music for the first time. In general, this technique is a linear approach to melodic development, derived from a main-tone embellished by other pitches during the development process. The main-tone serves as a centre of the melodic line in an atonal context. In *Initium*, individual

lines, drawn from the three note collection C–E–G♯, develop independently as shown in Figure 1. As it develops, each horizontal line becomes a harmony of C–E–G♯ vertically.

Figure 1. *Initium*: seconds 6"–12"

Chapter II: Musical Compositions

1. Initium[1]

Initium (start) for Mezzo-Soprano, Tenor, Bass Clarinet, and Electroacoustics with Video (2011) is the realisation of the artistic vision to create a musical language that can express the harmony of Heaven, searching for meanings in sounds by experimenting with wordless languages (phonemes) as a source of musical sounds. Ultimately, *Initium* reflects the journey of life. *Initium* experiments with phonemes in a musical context whether wordless languages including vowels and consonants are able to transform into musical sounds, developing a new musical language. Luciano Berio's *Sequenza III for voice (1966)* based on Markus Kutter's text was such a creative vocal piece which inspired me not only to further explore the relations between word and sound, but also to look at vocal expressions and acoustics of language as musical materials. He writes in his note,

> The voice carries always an excess of connotations, whatever it is doing. ... In order to control such a wide range of vocal behaviour, I felt I had to break up the text in an apparently devastating way, so as to be able to recuperate fragments from it on different expressive planes, and to reshape them into units that were not discursive but musical. In *Sequenza III* the emphasis is given to the sound symbolism of vocal and sometimes visual gestures, with their accompanying "shadows of meaning", and the associations and conflicts suggested by them.[2]

Individual phoneme, to some extent but not in an explicit way, conveys or implies or expresses meanings, feelings and emotions voluntarily (consciously) or involuntarily (unconsciously) since language is a social medium to exchange ideas and feelings with others. In Werner Wolf's *Language and/or Music as Man's 'Comfort'?: Beckett's*

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[1] This section is edited from the academic paper *Wordless Language as Musical Sound* which was presented at the PARLAY 2015 Conference at the University of York, York, on 11 September 2015.
Chang Seok Choi, 'Wordless Language as Musical sound', *York Papers in Linguistics: PARLAY 2015 Proceedings Special Issue - Issue* 3 (2016): 40–54, *https://yorkpapersinlinguistics.wordpress.com/parlay-proceedings/parlay-2015-proceedings/*, accessed 1 July 2016, https://yorkpapersinlinguistics.files.wordpress.com/2016/06/chang-seok-choi-parlay-proceedings-2015.pdf.
[2] Luciano Berio, '*Sequenza III (Author's Note)*', *www.lucianoberio.org*, accessed 15 February 2016, http://www.lucianoberio.org/node/1460?1487325698=1.

Metamedial Allegory Words and Music, interpreting the meaning of Bob and Joe in Samuel Beckett's *Words and Music*, he writes,

> In the allegory the meaning of Bob and Joe is relatively clear: they represent two creative faculties: music connoting, according to a received notion, the wordless, emotional side of human consciousness, and words in the sense of conscious language or even of poetry as a metonymy of literature.[3]

1.1. Backgrounds and Questions

I had an artistic vision to create a musical language that can express the harmony of Heaven. This, however, was purely my imagination, and only happened in an imaginary space that I created and dreamed of. In order to realise this creative vision into a musical composition, I needed a different kind of language from one that we speak daily. This must be poetic, cryptic and uncanny, and should not be interpreted and understood in a semantic and syntactic structure of an ordinary language. Therefore, a search for a new musical language began by looking at unique sounds, colours and timbres of individual voiced and voiceless sounds of vowels and consonants, and their relationships in a musical context. Wordless languages (phonemes) that share common sounds among many people in different countries and regions are the best means for this purpose. My initial research question was whether a wordless language can transform into a musical sound. If so, how? and is this musical sound able to express a metaphysical concept such as Musica Mundana, the harmony of the spheres? From this, can a musical work based on sounds of phonemes illustrate the language and the harmony of Heaven? Those questions correlate with sound symbolism (phonesthesia or phonosemantics) and ideophone (phonosemantic) that look for meanings in sounds or phonemes. The starting point of research was the characteristic of onomatopoeia that conveys a certain meaning directly and independently by the imitation of sounds. This characteristic of onomatopoeia has a great potential in development of a new musical language that can convey meanings, emotions and metaphysical aspects with non-lexical and non-syntactical structure of language. This quality of onomatopoeia inspired me to write a musical composition based on sounds of phonemes. In *Initium*, each sound of phonemes is an attempt to express allusive meanings of each phoneme and groups of phonemes. As a philosophical background, I was interested in Musica Mundana which is the harmony of

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[3] Werner Wolf, Language and/or Music as Man's 'Comfort'?: Beckett's Metamedial Allegory Words and Music, *Word and Music Studies*, ed. Suzanne M. Lodato and David Francis Urrows (Amsterdam: Rodop, 2005), 150.

celestial bodies inaudible to human ear. This principle links up with the ideas of using a wordless language in *Initium* which is a symbolic, metaphorical means to express the harmony of Heaven. Musica Mundana is an ancient Greek philosophical concept, introduced by Boethius (c 480–524 or 525 AD) in the early sixth century. According to Boethius' classification of music in his *De institutione musica* (commonly known as *De musica*), there are three categories; firstly, Musica Mundana as the Pythagorean harmony of the universe, which is inaudible, secondly, Musica Humana as the harmony of the body and the soul which is inaudible either, and thirdly, Musica Instrumentalis as vocal and instrumental music which is audible. What interests me about Musica Mundana is Pythagoras' understanding of the universe as musical proportion. In Thomas Stanley's *The History of Philosophy*, he writes,

> Pythagoras asserted that this world is made according to musical proportion, and that the seven planets, between Heaven and the earth, which govern the Nativities of Mortals, have a harmonic motion, and Intervals correspondent to musical distance and render various sounds, according to several heights.[4]

For instance, the musical interval from the earth to the moon is one tone, and the Moon to Mercury is a half, Mercury to Venus is a half, and Venus to the Sun is a tone and a half. The interval from the earth to the Sun is three tones and a half, and it is called Diapente. The interval from the Sun to Mars is a tone, Mars to Jupiter is a half, Jupiter to Saturn is a half, and Saturn to the supream Heaven is a half. The interval from the Sun to the supream Heaven is two tones and a half, and it is called Diatessaron. The total intervals from the Earth to the supream Heaven are the six whole tones, a Diapason concord, at the octave.[5] These musical intervals and philosophical ideas, however, were not applied to *Initium*.

1.2. Thoughts on Languages, Sounds, Feelings and Meanings

Language is a medium to carry thoughts, knowledge, feelings, emotions and ideas, and is an essential social communication tool in both speech and writing. As Saussure claims that the structure of a language is a social product of our language faculty,[6] meanings of languages depend on the established linguistic system where society adopts and practises it, and are constantly evolving, influenced and limited by cultural, geographical,

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[4] Thomas Stanley, *The History of Philosophy* (London: MDCCI, 1701), 393.
[5] Ibid.
[6] Ferdinand de Saussure, *Course in General Linguistics*, ed. Charles Bally and Albert Sechehaye with the collaboration of Albert Riedlinger, trans. and annot. Roy Harris (London: Duckworth, 1983), 9.

social, religious and political aspects. Despite these limitations of understanding a local language, in general, phoneme has its unique sound produced by its own vocal mechanism, and this sound can be developed into a musical sound (or language) for the purpose of colouring and shaping music. Although meanings of sounds of phonemes can be anything or nothing at all, sounds of phonemes associated with pitches can suggest metaphorical meanings of something in a musical context including feelings, poetic ideas and imagination that cannot be expressed by words, more specifically by current linguistic systems. 'The linguistic sign is arbitrary,'[7] says Saussure in his *Course in General Linguistics*. He defines a language as a system of signs expressing ideas,[8] and writes, 'A linguistic sign is not a link between a thing and a name, but between a concept and a sound pattern',[9] replacing concept and sound pattern respectively by signification and signal.[10] In Leibnitz's *New Essays concerning Human Understanding*, he sees the faculty of speech given by God as the great instrument and common bond of this society,[11] and says, 'Words are employed by men as signs of their ideas … the meanings of words are arbitrary (ex instituto).'[12] In his analogy of the faculty of speech between bird and man, he states,

> We can say that parrots and some other birds have words without language ...
> Man only is in a condition to avail himself of these sounds as signs of internal
> conceptions, in order that thereby they may be manifested to others.[13]

He interprets the letter R in the ancient German, Kelts, and other people allied to them as a violent movement and a noise like that of this letter, for example rinner, rüren (fluere), rutir (fluxion), the Rhine, etc.[14] Contrastingly, the letter L signifies a gentle movement, appearing in leben (vivre-live), leben (conforter-comfort, faire, vivre-make live), etc.[15] Since the letter W in the Teutons and other Kelts indicates the motion (of the air) such as wehen, wind, vent, he concludes that there is something natural in the origin of words which indicates a relation between things and the sounds and movements of the vocal organs.[16] This view is similar to conventional sound symbolism and quite contradictory to Saussure's dictum that the linguistic sign is arbitrary. It is interesting to see that some

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[7] Ibid., 67.
[8] Ibid., 15.
[9] Ibid., 66.
[10] Ibid., 67.
[11] Gottfried Wilhelm Leibnitz, *New Essays concerning Human Understanding*, trans. A. G. Langley (La Salle: The Open Court Publishing Company, 1949), 285.
[12] Ibid., 191–192.
[13] Ibid., 287.
[14] Ibid., 299.
[15] Ibid., 300.
[16] Ibid., 300–301.

letters (words) are partly associated with certain meanings. This cannot be generalised for a syntactic and semantic structure of language, but it can be partly used to designate sounds of phonemes to certain (or desired) meanings. This idea develops further to link the meanings of sounds of phonemes to musical sounds. However, this application of phonemes as a source of musical sounds is absolutely arbitrary in *Initium*, and there are no direct relations between phonemes and meanings in a musical context. According to Ohala's *Sound Symbolism*, sound symbolism is the study of the relationship between the sound of an utterance and its meaning.[17] Sound symbolism has four categories including corporeal (symptomatic sounds such as coughing and hiccupping), imitative (environmental sounds such as bang and bow-wow), synesthetic (the acoustic symbolisation of non-acoustic phenomena) and conventional symbolism.[18] For instance, conventional sound symbolism is the analogical association of certain phonemes and clusters with certain meanings: e.g. the 'gl' of glitter, glisten, glimmer, etc. [19] The Frequency Code named by Ohala in 1984 explains,

> High tones, vowels with high sound formants (notably /i/), and high-frequency consonants are associated with high-frequency sounds, small size, sharpness, and rapid movement: low tones, vowels with low sound formants (notably /u/), and low-frequency consonants are associated with low-frequency sounds, large size, softness, and heavy, slow movements.[20]

This frequency code underlying the sound-symbolic use of voice pitch[21] suggests quite interesting musical elements to be developed in phonemes because it is associated with pitch, one of the essential elements of musical sounds. Since there is no universal theory of sound symbolism that can cover many different views on phonemes, the use of phonemes in *Initium* is arbitrary, and none of linguistic theories are applied to, and is independent experiment with phonemes and their sounds and timbres.

1.3. Initium

Initium is a fantasy with three sections. This work also enhances the ideas of verbal gestures similar to descriptive speech in Pansori, a one-man operatic form of Korean folk music. Through breaking down words into individual vowels and consonants, and putting them together by disintegration and reintegration with the aid of phonetics, *Initium* creates

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[17] John J. Ohala, Leanne Hinton and Johanna Nichols (eds.), *Sound Symbolism* (Cambridge: Cambridge University Press, 1994), I.
[18] Ibid., 2–4.
[19] Ibid., 5.
[20] Ibid., 10.
[21] Ibid., 325.

unique colours, timbres and textures in sounds. *Initium* employs Sigimsae and a main-tone technique which are traditional Korean music elements. The process of separation and amalgamation of vowels and consonants produces relationships between their fragments, and generates musical phenomena that aspire to a new musical expression.

1.3.1. Musical Elements in Wordless Languages (Phonemes)

The experiment with phonemes as a basis of musical sounds in *Initium* is analogous to Malkiel's term morphosymbolism to some extent which is the term for the association of particular root-canon forms with particular parts of speech or their subclasses, e.g. the use of phonemes, of neutralisation, of abstract structural shapes, and of accent.[22] In *Initium*, phonemes become new sonic materials which create unique colours and timbres of sounds of phonemes. In Marinella Ramazzotti's *Luciano Berio's Sequenza III: From Electronic Modulation to Extended Vocal Technique*, she writes,

> Berio's research began with his study of the expressive qualities of the voice and the acoustic dimensions of language. From Schönberg, Berio would take *Sprechgesang* and transforms it from an expressionist gesture into an allusive gesture featuring the onomatopoeic dimension of language and ordinary vocal emission. From Varèse, Berio would take the process of reducing a text to phonetic material while combining the 'noisy', plosive components of consonants with vowels including aspirated vocal emissions and *sforzandi*. Linguistic phonemes represented, for Berio, the new sonic materials necessary to reach the 'objective physical reality' of sound, that is, the acoustic dimension that unites oral language, instrumental sounds, and the sounds of daily life.[23]

When phoneme, a basic unit of a linguistic structure, is treated in a musical context as a musical note, a basic unit of a musical sound, it can manifest itself in many different ways, demonstrating vocal gestures as explained in sound symbolism and acoustic phenomena which are beyond an explanation by words. The meaning of phoneme becomes something different from the meaning based on the conventional linguistic system. This ambiguous and eccentric quality of sounds of phonemes in a musical structure shapes the music with a colourful and exotic sound.

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[22] Ibid., 7.

[23] Marinella Ramazzotti, 'Luciano Berio's Sequenza III: From Electronic Modulation to Extended Vocal Technique', *Ex Tempore*, 81, *www.ex-tempore.org*, accessed 16 February 2016, http://www.ex-tempore.org/Sequenza.III.corretta.pdf.

1.3.2. Wordless Language

First of all, I disintegrated and reintegrated individual vowels and consonants whether sounds of phonemes can be a useful source of a musical sound and sonic materials, breaking down a word into small units of phonemes. For example, a word *initium* is deconstructed, embellished by other vowels and consonants, synthesised, and finally established as a whole sung normally only once at the end of the piece.

Initium

↓

i   t   i   n   i   m   u ⟶   Disintegration

| u/a/e | | s/o/a/p/f/e | ⟶   Embellishment

↓

i   n   i   t   i   u   m   ⟶   Synthesis

↓

Initium   ⟶   Establishment
                                                   (Reintegration)
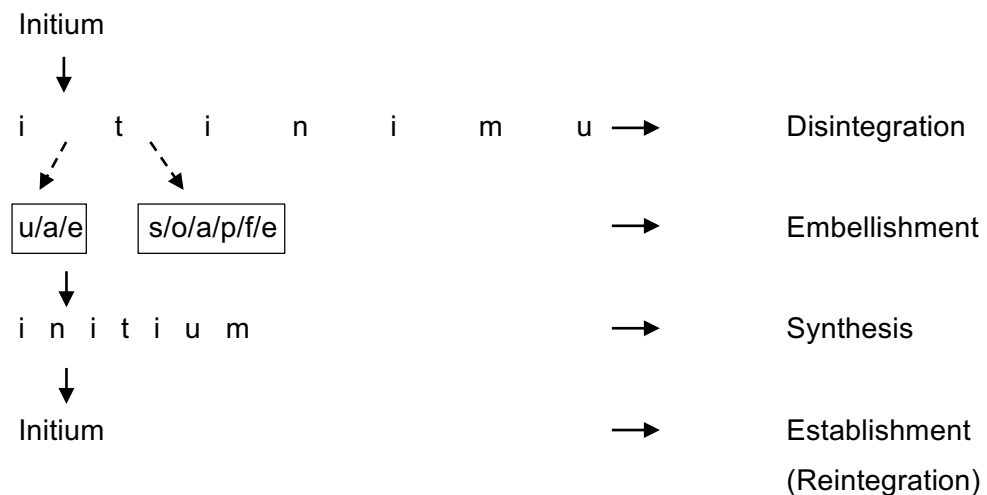
This process is similar to the characteristic of a main-tone technique as an individual tone sounds, develops with embellishments, and then returns to the original pitch. The distinctive sounds of vowels and consonants add unique qualities of sounds and colours to the music.

1.3.3. Vowels

In the mezzo-soprano as shown in the score and the IPA vowel chart in Figure 2, monophthong [i] moves to [u] gradually and seamlessly without interruption, simultaneously changing the position of the tongue from the front to the back. The production of vowel sounds is related with a frequency. Voiced sounds have pitches with regular pulses in a waveform, while voiceless sounds have pitches with irregular pulses. For instance, in *A Course in Phonetics*, Peter Ladefoged and Keith Johnson analysed sounds of vowels and consonants in the word *father*. In a vowel sound [a], the vocal folds were vibrating approximately one hundred times a second, producing a pulse of air every hundredth of a second, but in a consonant sound [f], there are no regular pulses because the vocal folds are not vibrating.[24] Ladefoged and Johnson state that the vowel has the pitch of the overtone that gives a distinctive quality to the vowel.

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[24] Peter Ladefoged and Keith Johnson, *A Course in Phonetics*, 7th ed. (Stamford: Cengage Learning, 2015), 7.

What you are hearing corresponds to a group of overtones that characterize the vowels. These overtones are highest for the vowel in *heed* and lowest for the vowel in either *hawed, hood*, or *who'd* … From this, it seems as if there is some kind of high pitch associated with the high front vowel in *heed* and a low pitch associated with one of the back vowels.[25]

IPA Vowel Chart
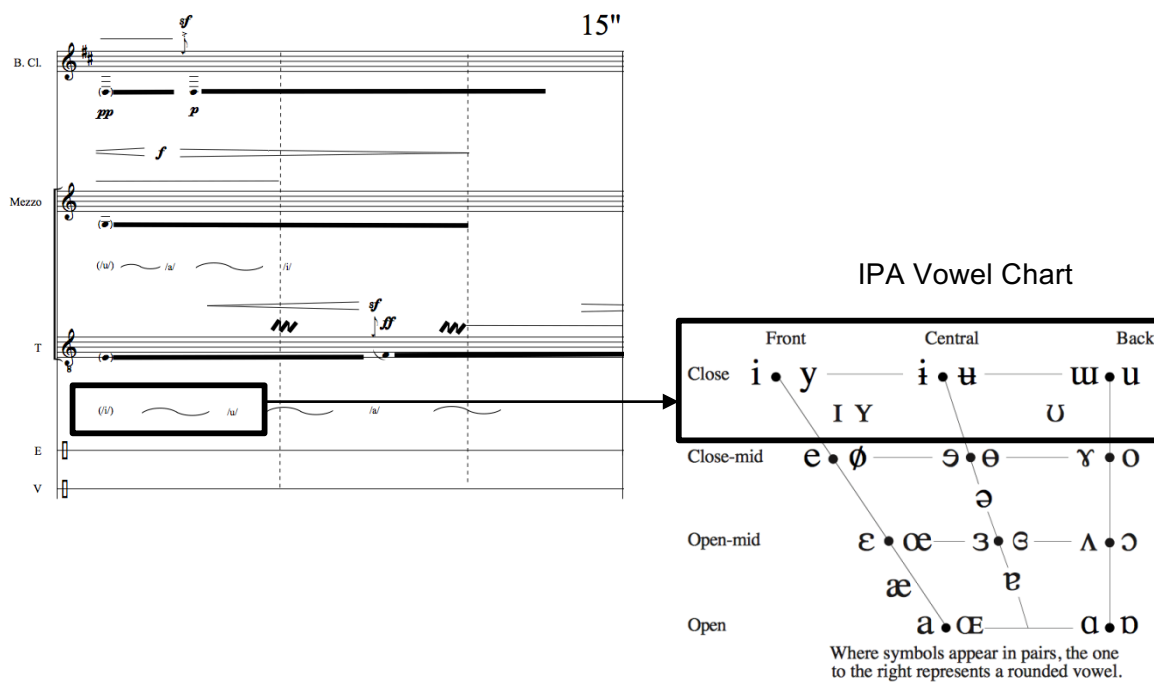
The official chart of the IPA as of 2005[26]

Figure 2. *Initium*: seconds 13"–15"

From a speech sound analysis, phonemes can relate to musical notes because phonemes and musical notes are associated with pitch. Even if there is no clear connection between language and music, language and music have a common factor that is frequency (pitch). Thus, phoneme can be applied to the music as a musical element.

1.3.4. Consonants

According to *A Course in phonetics*, in the description of English, consonants are specified by the places of articulations, e.g. labial, coronal and dorsal articulations. To be specific, fricatives are produced by the partial blockage of the airstream by two articulators in the vocal tract, e.g. [f] which is classified as a labiodental consonant and [s] which is

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[25] Ibid., 23.
[26] Ibid., From inside back cover.

classified as an alveolar consonant as well as sibilant that has a hissing sound. [f] belongs to a labial articulation, and [s] belongs to a coronal articulation. Moreover, oral stops and nasal stops are produced by articulatory gestures in the oro-nasal process. For example, when the soft palate is down and the air can go out through the nose, nasal stops [m] as a bilabial consonant and labial articulation, and [n] as an alveolar consonant and coronal articulation are produced. When the soft palate is raised and the nasal tract is blocked, oral stops [p] and [b] as bilabial consonants and labial articulations, [k] as a velar consonant and dorsal articulation, and [t] as an alveolar consonant and coronal articulation are produced. These consonants are called plosives.[27] As shown in Figure 3, in the mezzo-soprano and the tenor parts from 1'24'' to 1'33", those consonants (fricatives, nasal and oral stops) are articulated rapidly but clearly, and emit distinctive colours and timbres in sounds. In *Initium*, vowels and consonants are used randomly. There is no fixed phoneme group to make the sound. It is soley based on an artistic imagination and creation. Although there is no certain structure in the use of phonemes, without any lexical, semantic, and syntactic representation, this rendering of a wordless language unveils unique sound effects in a musical context, somewhat and somehow creating connotations of metaphysical and mysterious aspects which are associated with the harmony of Heaven. The disintegration and synthesis process of vowels and consonants are purely based on individual sounds of each phoneme. Generally speaking, phonemes on high pitches, usually appear as ornaments with a sharp, thin and bright quality, while those on the low pitches, often used in a long sustained note, have a soft, thick and dark quality. This sound production of a wordless language serves as a means to imitate verbal gestures such as shouting, speaking, whispering, and murmuring which are similar to Aniri, a descriptive speech, and Doseup (or Dosub), half way between sung and spoken, in Pansori. The other influencing feature in this process that conveys certain emotion is Chuimsae in Pansori, a simple meaningless vowel, exclamation, or short words, which are encouragements for the performer, given either by Gosu, the drummer, or by the audience. This, however, is not used explicitly in *Initium*.

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[27] Ibid., 10–18.

Labial Articulations   Coronal Articulations

Fricatives: /f/ (labiodental) and /s/ (alveolar & sibilant) Nasal Stops: /m/ (bilabial) and /n/ (alveolar)

Oral Stops: /p/ and /b/ (bilabial)   /k/ (velor)   /t/ (alveolar) ----- **Plosives**

Labial Articulations   **Dorsal Articulation**   **Coronal Articulation**

Figure 3. *Initium*: seconds 1'23"–1'35"

1.3.5. Pitch Organisation

A three note collection from the interval of the major third [C–E–G♯ (A♭)], is inspired by the proportion of an equilateral triangle and fractals as shown in Figure 4. This basic pattern further develops an eleven note collection including original and ten transposed collections without an eleven note collection ③ starting from a missing pitch D♯ (E♭) in the collection. Pitches of B and G are added to the left and right sides respectively with the

interval of the minor second for the purpose of symmetry as shown in figure 5. This structure can become transformed into a bigger structure as shown in Figure 6.
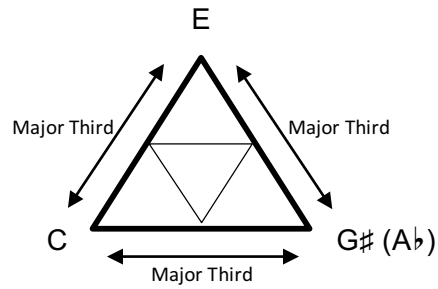

Figure 4. Pitch Organisation from an Equilateral Triangle
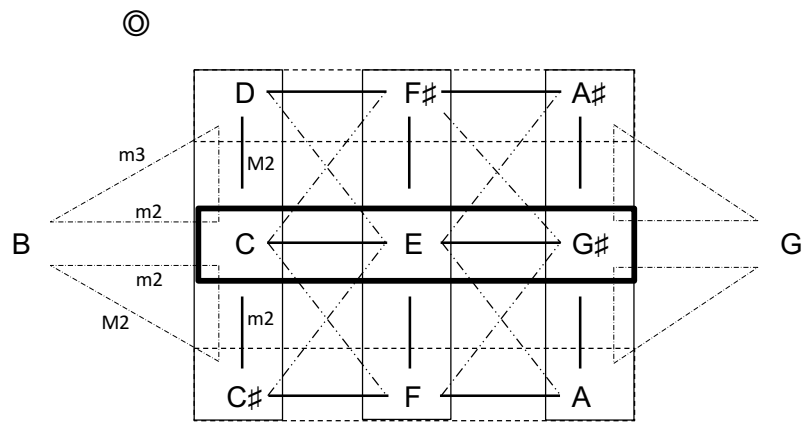
Figure 5. Structure of Eleven Note Collection (◎: Original Eleven Note Collection)

⑥	G♯	C	E	②	E	G♯	C			C	E	G♯	⑩
F	F♯	A	D	C♯	D	F♯	A♯	A		A♯	D	F♯	F
⑤	G	B	D♯	①	D	G	B			B	D♯	G	⑨
E	F	A	C♯	C	C♯	F	A	G♯		A	C♯	F	E
④	F	A♯	D	◎	D	F♯	A♯			A♯	D	F♯	⑧
D♯	E	G♯	C	B	C	E	G♯	G		G♯	C	E	D♯
③	F	A	C♯		C♯	F	A			A	C♯	F	⑦
D	D♯	G	B	A♯	B	D♯	G	F♯		G	B	D♯	D
	E	G♯	C	⑪	C	E	G♯			G♯	C	E	

Figure 6. Complete Transformation of Eleven Note Collection in *Initium*

The three note collections serve as a melodic as well as harmonic cell within an eleven note collection, adopting Sigimsae and a main-tone technique in the melodic and harmonic development. The harmonisation process can be based either on the same pitch collection or on a different pitch collection, or on the combination of both by interweaving pitch cells. Pitch cells are chosen at random, moving horizontally, vertically, diagonally, and mostly triangularly in the collections as shown in Figure 7. The most important intervals besides the major third are the minor and major second which function as a bonding agent within the major third framework. Regardless of the register, these intervals serve as a medium to keep a melodic coherence.
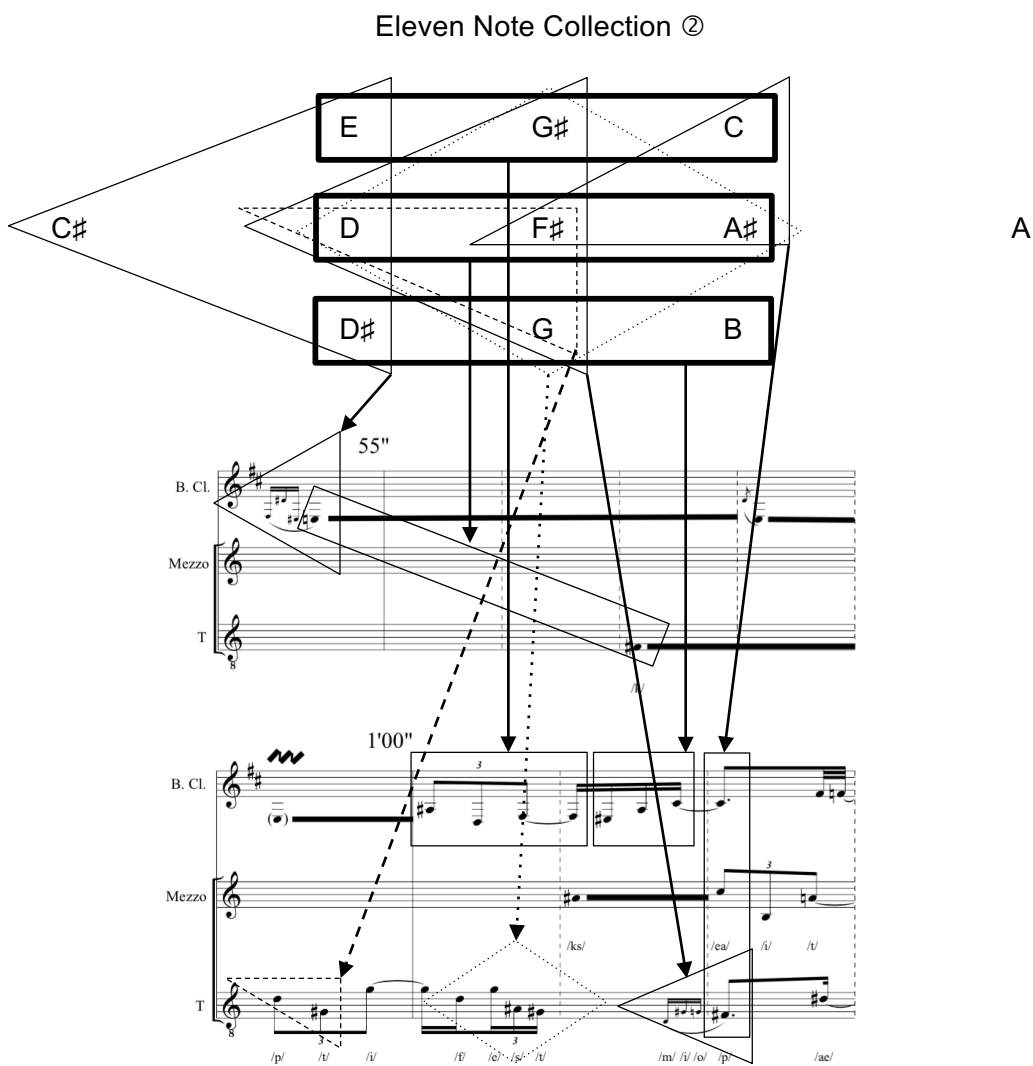
Eleven Note Collection ②

Figure 7. Interweave of Pitch Cells in *Initium*: seconds 55"–1'03"

1.3.6. Electroacoustic Music and Video

Through pitch shifting and time stretching, the gradation in pitches coincides with the gradual changes of hue in still images that imply philosophical meanings of a human being's life and life cycle. This character of the gradation in pitches recurs as a form of slow glissandi in *Eolgae (structure)* for Symphony Orchestra (2014). Fragments of sounds, taken from human voice, instruments and paper, are plainly processed in order to be sounding as natural as possible. The evocative still images on video reflect the journey of life. To view the video of *Initium*, visit the YouTube link as follows:

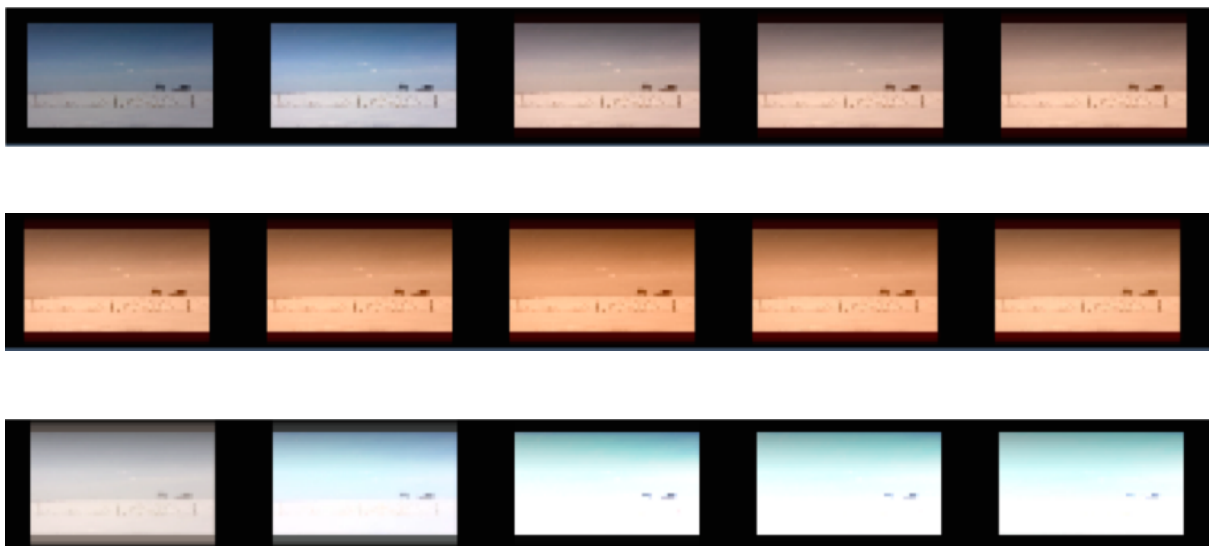https://www.youtube.com/watch?v=mQDULcgZIN0

Figure 8. Sequence of Still Images in *Initium*

In a musical context, an individual phoneme creates its distinctive colour, timbre and sound. When this unique characteristic of an individual phoneme alone or in a group of phonemes plays an important role as a musical element in the music, wordless language creates mysterious sound effects as well as allusive meanings of phonemes. The combination and contrast of phonemes yield the general impression of ethereal sounds and meanings which are different from an ordinary language and music. This vocal expression and acoustics of phonemes become relevant sonic and musical materials in realising the idea of the harmony of Heaven, establishing a unique form of a musical expression. A wordless language not only becomes one of the important sources of a musical sound in creating a musical composition *Initium*, but also becomes the expressional tool for emotions and meanings. The limited combination of individual voiced and voiceless sounds of vowels and consonants in a musical context can create musical

phenomena and also can reflect metaphysical meanings of the harmony of Heaven. Wordless language can be musical sound. *Initium* based on sounds of individual phonemes is the echo of the harmony of Heaven, searching for meanings in sounds.

2. Sanjo for Solo Viola

Sanjo for Solo Viola (2013) expresses a tenacious vitality of life that survives in the life cycle of birth, growth, culmination and extinction which incarnates ever changing four seasons in the music; Spring, Summer, Autumn and Winter, always denoting new birth at the end of life. The beauty of life lies in the endurance of beings that firmly resists all hardships: the true beauty is not its appearance, but its inner strength. The inspiration for the piece originally came from Gi-Gyeong-Gyeol-Hae, the structure of Jinyangjo (one of rhythmic patterns in traditional Korean music), a four-part structure that corresponds to each of four seasons (Table 2). For instance, in Spring there is a birth of life. In Summer there is a growth of life. In Autumn there is a culmination of life, and in Winter there is an extinction of life. But that is not the end of life because there is always a new beginning at the end of life. This strength and power of life is vividly coloured and embedded in the music. B♭ as a main-tone in the music expresses hope and endurance of life. Oliver Goldsmith writes, 'Our greatest glory of living is not in never falling, but in rising every time we fall.' [28] *Sanjo* for Solo Viola adopts the structure and the rhythm of Sanjo, an instrumental solo accompanied by Janggu, an hourglass-shaped Korean drum. Sanjo starts with a slowest rhythm, called Jinyangjo, becomes faster as music develops, and ends with the fastest rhythm, called Danmori or Hwimori. This rhythmic pattern becomes the skeleton of the piece which consists of four sections, and gives rise to vivid and spirited images of sounds. Sanjo is a Korean musical term and literally means scattered melodies. Sanjo was developed around 1890 by Kim Chang-jo for the Gayageum, a Korean string instrument with 12 strings. Each section refers to one of the four seasons respectively, using Sigimsae and a main-tone technique as well as a contrapuntal approach that creates hocket-like effects. The slow, static movement at the beginning contrasts with the fast, dynamic movement at the end, becoming more active as the music develops. The leading pitch (a main-tone) B♭ as a voice of hope embellished and developed by Sigimsae, often creates effects of the undulation of the pitch by sliding down and up.

2.1. Structure and Development

Sanjo for Solo Viola is inspired by the structure of Sanjo consisting of four rhythmic patterns (Jinyangjo, Jungmori, Jungjungmori, and Hwimori) which are used for the four sections in the piece. Particularly, four distinctive constituents of Jinyangjo influence the

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[28] Oliver Goldsmith, *The Citizen of the World; or Letters from a Chinese Philosopher, Residing in London, to His Friends in the East. … By Oliver Goldsmith*, Letter VII and Letter XXII (London: E. Spragg, for J. Good), 1793.

overall shape of the structure at the designing stage of the form of the piece. Jinyangjo has four Gaks (parts). A first Gak, called 'mineun sori' which corresponds to 'Gi', is the beginning of the music, referring to the spring. A second Gak, called 'daneun sori' which corresponds to 'Gyeong', is the growth and development of the music, referring to the summer. A third Gak, called 'maetneun sori' which corresponds to 'Gyeol', is the fruit and the harvest of the music, referring to the autumn (or fall). A fourth Gak, called 'puneun sori' which corresponds to 'Hae', is the relaxation of the music, referring to the winter. These four parts establish a structure of introduction, development, turn (crux or climax) and conclusion. This structure originates from classic Korean poetry.

Rhythm	Name	Framework	Seasons	Structure
Gak 1	Mineun sori	Gi	Spring	Introduction
Gak 2	Daneun sori	Gyeong	Summer	Development
Gak 3	Maetneun sori	Gyeol	Autumn (Fall)	Turn (Climax)
Gak 4	Puneun sori	Hae	Winter	Conclusion

Table 2. Structure of Jinyangjo

This basic framework is applied to the overall structure, and eventually becomes the structure of the entire piece.

Section	Bar	Rhythm	Framework	Seasons	Structure
1	1–26	Jinyangjo	Gi	Spring	Introduction
2	27–73	Jungmori	Gyeong	Summer	Development
3	74–136	Jungjungmori	Gyeol	Autumn	Turn (Climax)
4	137–274 (Coda; 220–274)	Hwimori	Hae	Winter	Conclusion

Table 3. Structure of *Sanjo* for Solo Viola

2.1.1. Section 1: Jinyangjo

The first section is governed by Jinyangjo which is a slow 24 beat pattern, consisting of four sets of 6 beats. A set of six beat is called 'Gak'

Figure 9. Jinyangjo Jangdan[29]

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[29] The term 'Jangdan' means the rhythmic pattern in traditional Korean music. The word 'Jang' literally means long and 'Dan' short.

The framework of Gi-Gyeong-Gyeol-Hae is applied to the development of the first section in the meter of 9/8 instead of 24/4 which is the original meter of Jinyangjo.

Framework	Gi	Gyeong	Gyeol	Hae
Bar	1–2	3–4	5–7	8–9
Gak	1	2	3	4

Table 4. Framework of Section 1

Usually, the fifth and sixth beats of the first and second Gak are slightly emphasised, and these emphases appear as syncopated rhythms on the third beat in bar 2 and the first and the second beat in a bar 4. The section of Jinyangjo is lyrical and pastoral, denoting the birth of life.

Figure 10. *Sanjo* for Solo Viola: bars 1–4

2.1.2. Section 2: Jungmori

The second section is governed by Jungmori which is a moderate 12 beat pattern, consisting of four sets of three beats. Since the altered meter 4/8 instead of the original meter 12/4 is used, the unique rhythmic pattern of Jungmori is eliminated except for the accentuation on the ninth beat which leaves a subtle trace of Jungmori rhythm.
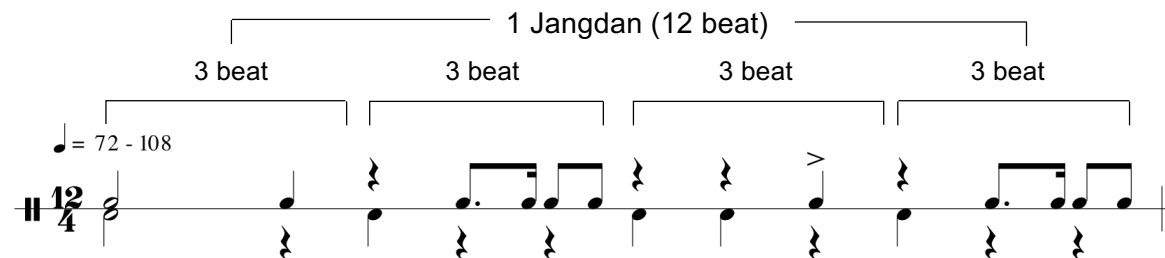

Figure 11. Jungmori Jangdan

The framework of Gi-Gyeong-Gyeol-Hae is also applied to the Jungmori section.

Framework	Gi	Gyeong	Gyeol	Hae
Bar	27–32 (28 & 29: Addition)	33–35	36–38	39–45

Table 5. Framework of Section 2

As the ninth beat in Jungmori is accentuated in practice, the first beat in bar 31 is emphasised by *mf*. This section develops the previous materials introduced in the first Jinyangjo section, especially the leading pitch B♭, denoting the growth of life.

2.1.3. Section 3: Jungjungmori

The active third section is governed by jungjungmori which is twice as fast as Jungmori, denoting the culmination of life. Similar to the Jungmori section, the altered meter 4/8 instead of the original meter 12/8 is used. Thus, the unique rhythmic pattern of Jungjungmori is also eliminated except for the accentuation on the ninth beat which leaves a subtle trace of Jungjungmori rhythm.
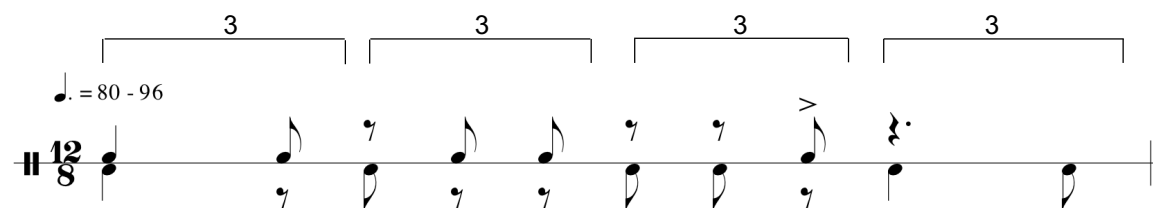

Figure 12. Jungjungmori Jangdan

The framework of Gi-Gyeong-Gyeol-Hae is used as shown in Table 6.

Framework	Gi	Gyeong	Gyeol	Hae
Bar	74–77 (75: Addition)	78–80	81–82	83–84

Table 6. Framework of Section 3

Like Jungmori, the accentuation appears on the ninth beat of the rhythm of Jungjungmori which is *ff* in the first beat as a syncopated rhythm in a bar 77.

2.1.4. Section 4: Hwimori

This Hwimori section gives a vibrant quality with excitement to the music, employing the fastest tempo and rhythm in Sanjo, followed by a coda which echoes the beginning of the piece. This section denotes the extinction of life as well as the new beginning of life. There are two types of Hwimori.

Figure 13. Hwimori Jangdans

These two rhythms are quite similar, accentuating the second half of the third beat. The rhythm ① is used in Pansori, and the rhythm ② is used in Sanjo. This section adopts the rhythm ① even though this piece is based on the rhythm of Sanjo. An altered rhythm that is the same as Hwimori Jangdan ① above appears at a different speed in bars 137–139. The substantial use of dyads in sections of Jungjungmori and Hwimori colours the music vividly, exploring myriad sounds and timbres of dyads.

Figure 14. Alteration of Hwimori Jangdan ① in *Sanjo* for Solo Viola: bars 136–139

Sanjo for Solo Viola employs one of the unique characteristics of rhythmic development in traditional Korean music, called Man-Jung-Sak which is a gradual change of tempo, starting with the slowest rhythm, becoming faster and faster, and ending with the fastest rhythm. This distinctive feature recurs in the large orchestral work *Eolgae* later.

2.2. Five Note Collection

Melodic and harmonic development is based on two sets of a five note collection and two sets of its inversions.

A. Five Note Collections

B. Combination of Five Note Collections

Figure 15. Five Note Collection

The leading pitch B♭ is developed through a main-tone technique and Sigimsae at the beginning of the piece. This leading pitch B♭ often appears throughout the piece, especially in sections of Jinyangjo, Jungmori, and Hwimori.

Figure 16. Main-tone and Sigimsae in *Sanjo* for Solo Viola: bar 1

3. Spacetime[30]

Spacetime for Flute, Clarinet, Trumpet, Trombone, Percussion, Harp, Piano, Violin and Cello (2014) expresses human's hope and courage against all kinds of odds, toils and sufferings from the present life. *Spacetime* is all about Hope and recovering the innate hope. The inspiration for the music originally came from *Cheongsan Byeolgok (Song of the Green Mountain)*, a Korean poem from the Goryeo dynasty (c. 968 - 1392), and people who suffered unimaginable hardships and troubles at that time. Despite all troubles, they never gave up hope and moved on, dreaming and searching for utopia where ordinary people live in peace without greed. This journey of hope, endurance and courage is vividly coloured sometimes by intensive sounds and timbres, and sometimes by soft sounds and timbres. This musical composition is an attempt to apply a poetic structure to a musical structure to some extent, searching for a new approach to musical form.

3.1. Background

T. S. Eliot's *The Waste Land (1922)* was a starting point of the understanding of the relation between poetic and musical structures. The form of *The Waste Land* which seems shapeless and does not belong to any typical categories in traditional poetic form triggered my imagination on musical form that envisioned time as space allocating musical materials horizontally or vertically into an imaginary space[31] according to the spatial-time framework. Angela Leighton regards form as a force. In her book *On Form*, she writes, 'Form is not a fixed shape to be seen, but the shape of a choice to be made.'[32] This seems that she defines form as a decision-making and forming-form process that shapes the whole at the end. Seeing form as a force gave me a fresh perspective on form, and opened up one of many possibilities to formulate form. From this, I started to have a different approach to musical form. Form does not have to be a fixed form at the beginning. Form can start from fragment or fragments that has unique quality, and grow alone or symbiotically with self-similar or totally different materials becoming a bigger structure than itself. The final product of this process does not have to be a perfectly

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[30] This section is edited from the academic paper *Structural Transformation of Goryeo Gayo Cheongsan Byeolgok in Spacetime* which was presented at the BFE/RMA Research Students' Conference 2016 at the Bangor University, Wales, on 8 January 2016.

[31] Marina Lobanova, *György Ligeti: Style, Ideas, Poetics*. (Berlin: Verlag Ernst Kuhn, 2002), 55.
The term 'the imaginary space' was used by Ligeti's description about frozen time, and I used this term as the imaginary dimensions where I can use musical materials freely without any limitations of time and space.

[32] Angela Leighton, *On Form: Poetry, Aestheticism, and the Legacy of a Word* (Oxford: Oxford University Press, 2007), 16.

shaped form, but it can be shapeless containing its original meanings and characters in such context. The theories of fractals, chaos and butterfly effects also influenced in forming a new thought on form. To be specific, fractals in mathematics that have similar patterns in itself provide me with a unique approach to create and organise fragment as a musical material and to construct the skeleton of the structure that becomes a basis of an overall form of the whole musical work sustaining its original character.

Back in 2013, I was reading Eliot's *The Waste Land*, and I was amazed by the fact that the poem is full of citations, and even quotes from the voice of a young sailor in Scene One of Wagner's opera *Tristan and Isolde* which is quoted in lines 31 - 34.[33]

Frisch weht der wind	Fresh blows the wind
Der Heimat zu	To the homeland
Mein Irisch kind,	My Irish Child
Wo weilest du?	Where do you wait?

Eliot's use of citations to his poem changed the way I think about form and led me to rethink what a musical form really is, why I need this form, and how it should be formed. Subsequently, this reasoning led me to look at Elliott Carter's collage, cross-cutting, and mosaic techniques.

3.2. Spacetime

3.2.1. Rhyme Scheme

In terms of formation of a new thought on form, there were two important poems. One was T. S. Eliot's *Four Quartets*, and the other was *Cheongsan Byeolgok*. The former made me think how space exists in time, and seek for the true meaning of existence of being. The latter suggested that a poetic structure might become a musical structure, offering a philosophical background to music. In Eliot's *Four Quartets*, time is an eternal matter, where the past and the future can be seen as the present:

> Time present and time past
> Are both perhaps present in time future
> And time future contained in time past.
> If all time is eternally present
> All time is unredeemable.
> …
> Time past and time future
> What might have been and what has been
> Point to one end, which is always present.[34]

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[33] Thomas Stearns Eliot, *The Waste Land: Authoritative Text, Contexts, Criticism*, ed. Michael North (New York: W. W. Norton & Company, INC., 2001), 6.

Interestingly, Ligeti also says, 'Music as frozen time, as an object in the imaginary space evoked in our imagination, as an object which in a real sense unfolds over time and yet in an imaginary way is simultaneously present in all its moments.'[35] In physics, spacetime is any mathematical model that combines space and time into a single interwoven continuum.[36] Three dimensional space can be seen, but time (the fourth dimension) cannot. The understanding of time as space permeates my musical work *Spacetime*. In this process, *Cheongsan Byeolgok* was a great inspiration as a musical and philosophical matter. The theme of this poem is hope, and the author of the poem is unknown. This poem was sung in performance during Goryeo dynasty (c. 968 - 1392), and handed down orally. During Goryeo dynasty, many people went through foreign invasions as well as domestic troubles, experiencing kings' and kings' relatives' nepotism and despotism, and treacherous subjects' and military subjects' oppression. Even though they lost their lands and became outcasts, they did not give up hope, and had courage to make and to sing this song, looking for an ideal land.

청산별곡   Song of the Green Mountain

        작자 미상   Anonymous

Translated by Chang Seok Choi

살어리 살어리랏다	I will live, I will live.
청산의 살어리랏다	I will live on the Green Mountain.
멀위랑 다래랑 따먹고	Picking and eating wild grapes and hardy kiwi,
청산의 살어리랏다	I will live on the Green Mountain.
얄리 얄리 얄랑셩	Yalli yalli yallang syeong
얄라리 얄라	Yallari yalla.

The initial attempt was to transfer a rhyme scheme from *Cheongsan Byeolgok* into a musical structure in *Spacetime*, visualising it as space in time as shown in Figure 17. During the process of applying rhyme as a musical structure, the rhyme scheme of *Cheongsan Byeolgok* turned out to be quite similar to a ternary form. From this process, I gradually started to see time as space. Especially, my understanding of space and time simply began with the spatialisation of musical events through stratification and juxtaposition in time and leads to the term spatialisation of time that sums up this process.

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[34] Thomas Stearns Eliot, *The Complete Poems and Plays of T. S. Eliot* (London: Faber and Faber Limited, 1969), 171–2.
Lines 1–5 and 46–48 from *Burnt Norton (1935) in Four Quartets*.
[35] Marina Lobanova, *György Ligeti: Style, Ideas, Poetics*. (Berlin: Verlag Ernst Kuhn, 2002), 55.
[36] Wikipedia, 'Spacetime'. *www.wikipedia.org*, accessed 16 February 2016, https://en.wikipedia.org/wiki/Spacetime.

In general, the term spatialisation of time is largely based on the distribution of musical materials as a whole or a fragment at the same and different time in my musical compositions, using a canonic approach. There are two ways of realising this; one is vertical, and the other horizontal one. Influenced by Ligeti's frozen time, I created an imaginary space where there is no limitation in time and space. I can distribute musical materials into this imaginary space freely. This imaginary space and time is a total freedom of creation. In this imaginary space and time, I can stretch fraction of time to eternity, or I can compress eternity to fraction of time.
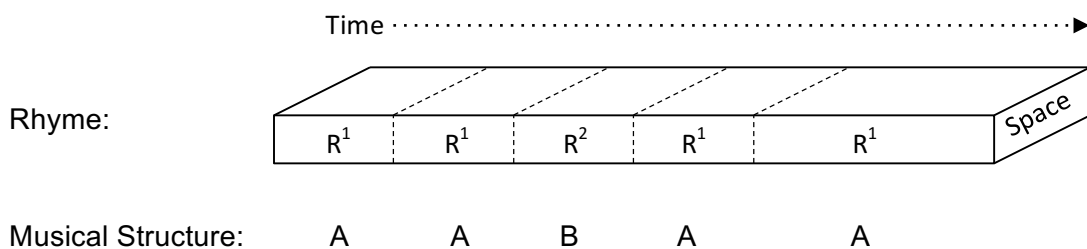
Figure 17. Diagram of Rhyme Scheme of *Cheongsan Byeolgok* (First of Eight Stanzas)

3.2.2. Structural Development and Transformation

Spacetime consists of three sections of **ABA'** including three sub-sections in section **B**, and the structure of the poem has transformed into this new musical structure.

Figure 18. Transformation in Structures of *Cheongsan Byeolgok* and *Spacetime*

As shown in Figure 18, a five-section structure (A B C D A') corresponds to each of five sections of the poetic structure including introduction, development, climax, conclusion and refrain. All five sections of the musical structure employ the melodic and rhythmic fragments which are randomly allocated and differently appeared in each section. Those fragments are the core musical elements that connect each section coherently, giving a

sense of unity to the music. The refrain in the rectangle in Figure 18 contains onomatopoetic words that are used for the purpose of musical rhythm (e.g. Yalli yalli etc.). These meaningless words provide the poem with rhythmic and colourful sounds of words.

3.2.3. Rhythmic Design

Throughout section B, the rhythmic patterns of Janggu are employed in order to mirror the Korean aesthetics in the poem by the use of traditional Korean rhythms. Rhythmic patterns are based on the musical score of *Cheongsan Byeolgok* contained in the fifteenth – sixteenth century collection Siyong Hyang Ak-po (시용향악보). Korean poetry is usually sung in practice, and accompanied by drums such as Janggu or Buk (also called Sori-Buk which is a shallow barrel-shaped drum). There are four types of performance techniques in playing Janggu as follows:

- 고 (Go or Ko): Strike the head of the left drum with the left hand or with a mallet.

- 요 (Yo): Strike the head of the right drum with a bamboo stick, letting the stick bounce several times.

- 편 (Pyeon): Strike the head of the right drum with the right hand or with a bamboo stick.

- 쌍 (Ssang): Strike both heads of the drum with hands or a mallet in the left hand and a stick in the right hand simultaneously.

In addition to that, a particular set of beats is arranged for each performance technique in Janggu to accompany the poem. For instance, Go (or Ko) has five beats, Yo three beats, Pyeon five beats, and Ssang three beats. In the original score from Siyong Hyang Ak-po as shown in Figure 19, the small squares, beginning at the top of the right hand page and reading downwards, indicate one beat, equivalent to the value of crotchet in western musical notation, and the large squares indicate the total amount of beats for that syllable. In this case, the syllable '살' (Sal) shown in Figure 19 has three beats in total.
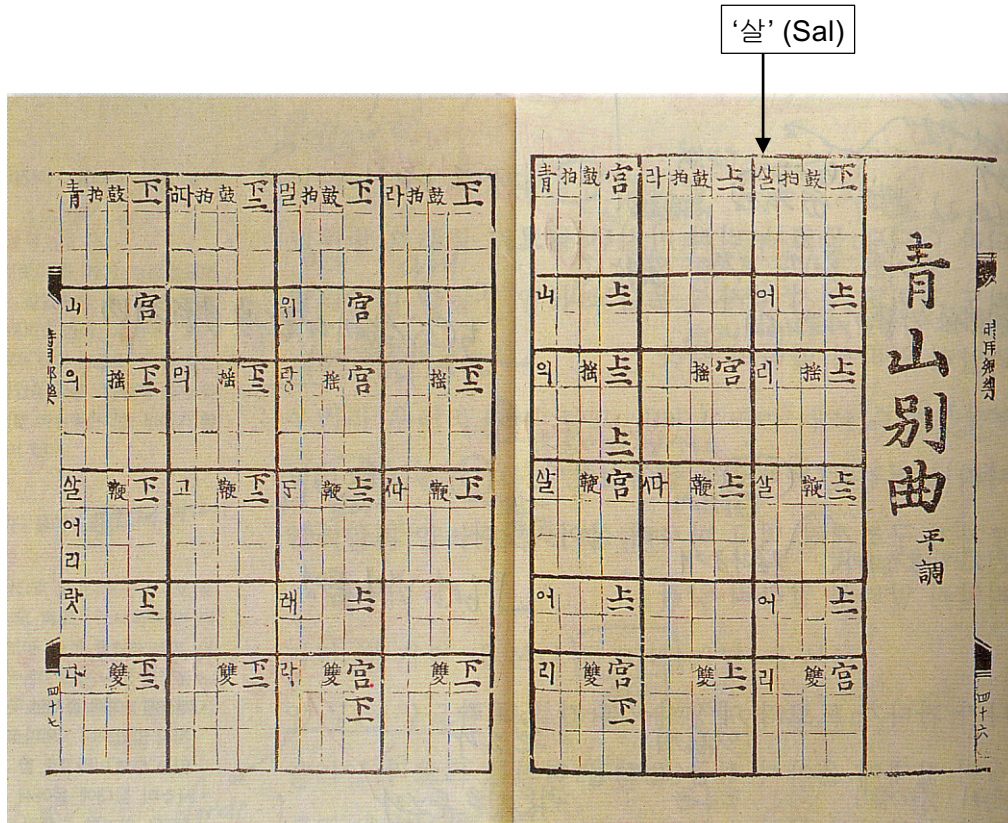
Figure 19. *Song of the Green Mountain (청산별곡)* from Siyong Hyang Ak-po
(시용향악보)[37]

The summary of beats in the first line of the poem, accompanied by Janggu, is shown in Figure 20. Metrical feet, however, are not directly related to rhythmic patterns in the music.

Beat:	3 2	3	3 2	3	8 (323) 8 (323)
Syllable:	살 어	리	살 어	리	랏 다
Janggu Rhythm:	Go (고)	Yo (요)	Pyeon (편)	Ssang (쌍)	
	5	3	5	3	

Figure 20. Rhythmic Pattern of Janggu in the First Line of the Poem

These rhythmic patterns are executed by Harp, Percussion group 1, Violin and Cello, and repeated until section B ends. (see Figure 21)

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[37] Wikipedia, '청산별곡', *https://ko.wikipedia.org/wiki/위키백과:대문*, accessed 16 February 2016, https://ko.wikipedia.org/wiki/청산별곡.
Siyong Hyang Ak-po is a selection of Korean music handed down from the Goryeo dynasty. This score was written between 1469–1544 during the reigns of kings Seongjong and Jungjong in the Joseon dynasty (1392–1897).

Figure 21. *Spacetime*: bars 50–56

In *Spacetime*, unique sounds and techniques of Sigimsae are transferred to Western performers and instruments in an atonal context. This Sigimsae gives music traditional Korean musical flavours, employing different types of embellishments, for example grace notes, glissandi and vibrato.

3.2.4. Pitch Design

Spacetime adopts a less complex approach to harmonic density with a much reduced harmonic accompaniment which punctuates the melodic line. *Spacetime* is based on four seven note collections.

Figure 22. Four Seven Note Collections

The first of these seven note collections Ⓐ is used substantially at the beginning of the piece from bars 1–32, exploring a greater possibility of intervals. From bar 50 onward, chords built on the combination of intervals are utilised for the clarity in sounds as well as a clear direction.

bars 50–62   bars 63–65   bars 66–74   bars 75–77   bars 78–80

● : Added pitch

Figure 23. Chords by the Combination of Intervals

These harmonies create colourful and exotic sounds, continuously keeping the originality of Sigimsae with simplicity as shown in Figure 24. The interplay and combination of Sigimsae and intervals or chords from a seven note collection serves as an agent to transform these musical materials to something different from originals. The use of traditional rhythmic patterns enriches the textures and colours in *Spacetime*.

Chord by the Combination of Intervals m2 + A4 from Seven Note Collection Ⓐ

● : Added pitch

Figure 24. *Spacetime*: bars 79–87

4. Eolgae[38]

정철 (1536–1593)   Jeong Cheol (1536–1593)

Translated by Chang Seok Choi

어버이 살아실제 섬기기란 다하여라   Serve your parents to your fullest whilst they are alive.

지나간 후면 애닯다 어이하리   After they are gone, it is heartbreaking. What can you do?

평생에 고쳐못할 것은 이뿐인가 하노라   What you cannot rectify forever is this!

Eolgae (Structure) for Symphony Orchestra (2014) is dedicated to my parents for their unfailing love and support throughout my whole life. Jeong Cheol's poem was such an inspiration during the compositional process, constantly reminding me of filial duty as a man. *Eolgae* is one huge living entity that flows freely and seamlessly in a shapeless form with powerful forces like deep ocean water currents. Capturing the highly versatile character of water that not only changes itself according to surroundings, but also changes surroundings along its way, the music evolves like a living organism, becoming a larger structure than itself through a constant transformation similar to water formulated from one oxygen and two hydrogen atoms. Water is a vital element in all forms of life on earth. The power to change itself and others without losing its originality and identity is the key to the music which is a realisation of a musical idea as well as an artistic vision that the music flows like water!

What is form? More specifically, what is a musical form? Clearly, you can hear and feel musical sounds, but you cannot see them regardless of their shape. Similarly, water is transparent and has a clear structure in a micro level, but you cannot see this microscopic structure of water with the naked eye. According to Rossing, Moore and Wheeler's *The Science of Sound*, sound can be described as two things: 'an auditory sensation in the ear and the disturbance in a medium that can cause this sensation.'[39] In terms of auditory perception, it says, 'Sound waves travel in a solid, liquid, or gas … As the wave travels through the air, the air pressure changes by a slight amount, and it is this slight change in pressure that allows our ears (or a microphone) to detect the sound.'[40] In Felix Franks' book *Water*, he writes, 'Water is the only inorganic liquid that occurs naturally on earth … It is also the only chemical compound in all three physical states: solid, liquid and

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[38] This section is edited from the academic paper *Formless Form as Forma Efformans* which was presented at the Innovation In Music 2015 at the Anglia Ruskin University, Cambridge, on 8 June 2015.

[39] Thomas D. Rossing, F. Richard Moore and Paul A. Wheeler, *The Science of Sound*, 3rd ed. (San Francisco: Addison Wesley, 2002), 3.

[40] Ibid., 4.

vapour.'[41] There is some similarity between sound and a micro structure of water, i.e. the invisibility of the existence. They are invisible with the naked eye, but they do exist. There must be some agents to make their existence possible and meaningful. Felix writes, 'A liquid ... is characterised by the random diffusion (Brownian motion) of molecules and by the absence of periodic order. In other words, the liquid state cannot be described by a set of molecular coordinates.'[42] In general, the visible shape of water in a macroscopic sense depends on its surroundings rather than itself. In other words, a microstructure of water can transform into a macrostructure without losing its original quality. This flexible characteristic of water became a new formal idea for *Eolgae*, and also a question of how I can apply this flexibility of water into a compositional process as an underlying concept of a musical form in order to build a larger structure which has a seamless flow. In this vein, the understanding of form as a force that refers to Forma Efformans (living form) through a constant transformation is an essential and necessary tool to see a musical form differently. Therefore, Forma Efformans as a living form becomes the important element to create the distinctive concept of Formless Form that yields the fluidity in *Eolgae* like that in water.

4.1. Background

Despite the ambiguity of form in Eliot's *The Waste Land*, this unusual, collage-like, shapeless form that rejects the established tradition, has nurtured creative thinking on form that does not have to be seen in the way Angela Leighton describes it, 'Form is a shaping activity rather than a visual shape.'[43] Eliot's unique perspective on a poetic form was a starting point for looking at a musical form differently. Seeing form as a force rather than a shape opened the door to a new musical form. Angela Leighton writes, 'Form is not a matter of correct techniques; it is a force of creativity generally."[44] She emphasises Coleridge's argument about the difference between the living and the dead form; form as proceeding and shape as superinduced.[45] Coleridge writes, 'All form as body, i.e. as shape, & not as forma efformans, is dead.'[46] Forma Efformans is Latin, and means forming form (living), rather than formed form (dead). This invisible force as form can be compared to powerful forces of deep ocean water currents which shape water itself as well as its surroundings. Form in music is inarguably related to time rather than a physical

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[41] Felix Franks, *Water: 2nd Edition A Matrix of Life*. (Cambridge: RSC Paperbacks, 2000), 1.

[42] Ibid., 41.

[43] Angela Leighton, *On Form: Poetry, Aestheticism, and the Legacy of a Word* (Oxford: Oxford University Press, 2007), 7.

[44] Ibid., 23.

[45] Ibid., 131.

[46] Ibid., 124.

shape like other genres of arts because sounds can be only audible in the context of the passage of time. In a melodic, harmonic, and rhythmic development, time acts as a catalyst to bond these disparate musical materials together respectively or simultaneously, and transform them into something different, creating relationships between them. These relationships soon become function that seems to produce musical phenomena. This critical thinking process became a basis for a fresh and creative approach to musical form. Form can be completely decomposed through separating complex textures into small parts or fragments, and then aggregated through arranging them orderly or randomly. This flexible and open approach paved the way into the concept of formlessness in a musical form.

4.2. Formless Form

4.2.1. Formless Form as Forma Efformans

Formless Form is the concept of a form in a micro level which converts to a different form in a macro level, not only transforming itself constantly according to its surroundings, but also influencing them. Thus, by the application of this concept to the compositional process, a microstructure in pitch and rhythm through Talea and Sigimsae can transform into a macrostructure in a shapeless form without losing its originality, creating fluidity in the music. This idea was inspired by the structure of water that has a certain formula (H_2O) on a micro level while it has no regular shape on a macro level. Due to its shapelessness as a macroorganism, water can be spring, stream, river, or sea. Also it can be transformed into different substances such as ice, liquid, or water vapour. Whatever shape water has, it is still water! When I conceived this flexibility of water as a musical idea for a large orchestral work *Eolgae (Structure) for Symphony Orchestra (2014)*, I imagined continuous flow and changes of musical materials in a shapeless form based on fragments that construct a micro structure and become a macro structure as they evolve. *Eolgae* is built on this concept of Formless Form which creates flowing characters with a forward-moving directionality through a constant transformation. Formless Form is a procedural concept, i.e. a concept of transformation process, rather than a fixed shape (form). Coleridge's interesting term Forma Efformans enhances the concept of Formless Form that understands form as a force which refers to a living form through a constant transformation rather than a dead form (formed form), and highlights the fluidity in Formless Form. In *The Musical Idea and the Logic, Technique, and Art of Its Presentation*, Schoenberg defines music as 'a musical poet's or thinker's presentation of musical

ideas',[47] and in *Fundamentals of Musical Composition*, he also describes form as 'the organisation of intelligible musical ideas, logically articulated.'[48] In this sense, for me, a musical idea, imagination, or vision is a key element of my music and musical form. A musical fragment based on a musical idea is a starting point of my music, and evolves into a larger structure that expresses musical ideas fully in a musical form, but this form only serves as a medium to realise my artistic vision into a musical composition.

4.2.2. Eolgae

Eolgae is based on this musical and formal innovation in the concept of Formless Form as Forma Efformans that achieves simplicity with flowing characters and a forward-moving directionality. *Eolgae* combines Sigimsae with Talea, adopting Sijo, a three line short Korean poetic form that has a twist (or a surprise) in it, as an underlying structure. The structure of *Eolgae* is built by constant transformation of Sigimsae and Talea through time, and dynamic modification with the use of Man-Jung-Sak, a gradual change of tempo in traditional Korean music that becomes faster as the music develops. A dense canonic structure serves as a melting-pot of transformation, blurring and interweaving Talea and Sigimsae, and fusing and turning them into something different which has a unique characteristic without losing its identity. There are three constructing stages of structures. Firstly, Sigimsae and Talea serve as a micro structure, and secondly, canon serves as a main vehicle to construct and develop this micro structure to a larger structure. Finally, Sijo serves as a macro structure for the whole piece. These processes serve as clear inner structures in order to realise constant changes and seamless flow of the music in a formless form that emanates blurring and amorphous effects to some extent.

4.2.3. Bonding Agents

What interests me about water is that it is a microorganism that can turn itself into the macroorganism through the constant transformation. At the micro level, water has a certain chemical formula, but at the macro level, it is shapeless because it can be any shape according to its surroundings. Covalent bonds are the key force that connects the atoms of a water molecule, forming a larger structure than itself. Interestingly, this basic concept led me to the idea of Formless Form in *Eolgae*, looking at the elements that can bond, develop, and transform musical materials into a much bigger structure. Angela

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[47] Arnold Schoenberg, *The Musical Idea and the Logic, Technique, and Art of Its Presentation*, ed. Patricia Carpenter and Severine Neff (New York: Columbia University Press, 1995), 1.

[48] Arnold Schoenberg, *Fundamentals of Musical Composition*, ed. Gerald Strang with the collaboration of Leonard Stein (London: Faber and Faber Ltd, 1967), 213.

Leighton regards form as a shaping activity[49], supporting Coleridge's view of form that 'form is its self-witnessing, and self-effected sphere of agency.'[50] She asserts that 'form is not a body but an agent.'[51] In her writings, she sees form as a communicated liveness, referring to the subject of Susan Wolfson's book, *Formal Charges* (1997)*, which defines form as a force, an energy, a subtle *j'accuse*.[52] In *Eolgae*, this idea is realised by combining Sigimsae and Talea through canon. Canon is a main vehicle of blending the melodic and rhythmic fragments, and serves to build layers at the same and different speeds, obscuring the regular pulses as well as melodic contours. There is a clear melodic and rhythmic cell as Talea, often associated with Sigimsae in a micro level. As it develops through canon and ametrical rhythm, the texture, superposed by melodic and rhythmic lines, becomes intermingled, blurring the shape of the music. This gives formlessness to the music.

4.2.4. Pitch

The pitch organisation of the music was inspired by the structure of water which has one oxygen and two hydrogen atoms, joined together by covalent bonds as shown in Figure 25. Covalent bonds share two electrons in order to bond two hydrogen atoms. This idea led me to think about the idea of bonding agents in musical materials, specifically in intervals and rhythms, and then whether this critical understanding of chemical reactions can be applied to the compositional process as well as the music. Another element in my pitch organisation was the shape of a snowflake, which has hexagonal symmetry. These two ideas are combined to generate a six note collection which has symmetry by a tritone. This six note collection creates two motifs (Motif A and Motif B) in which a tritone acts as a bonding agent in a symmetrical structure. (see Figure 26) These two motifs are basically the same, but with a different order of pitches, and produce their variants. These fragments from the pitch organisation become a larger structure as the music develops, interacting with Talea which is designed proportionally, as well as sometime utilising elements of Sigimsae and a main-tone intermittently.

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[49] Angela Leighton, *On Form: Poetry, Aestheticism, and the Legacy of a Word* (Oxford: Oxford University Press, 2007), 7.
[50] Ibid., 131.
[51] Ibid., 7.
[52] Ibid., 23.

Covalent Bond of Water   Hexagonal Shape of Snowflake

© Photo by Wilson Bentley[53]

Pitch Organisation
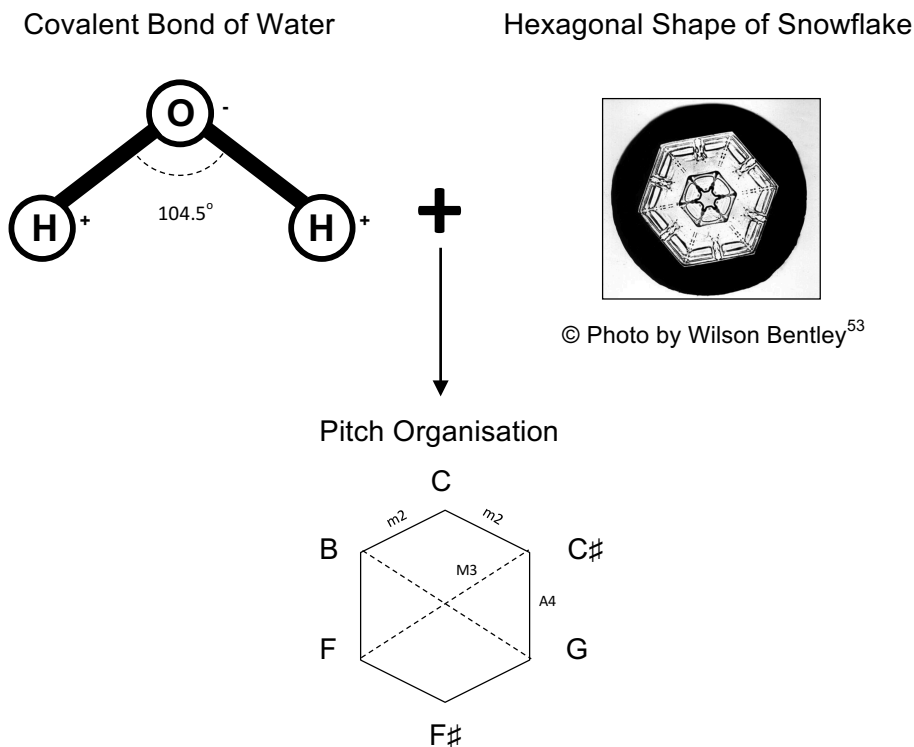
Figure 25. Pitch Organisation Inspired by the Structure of Water
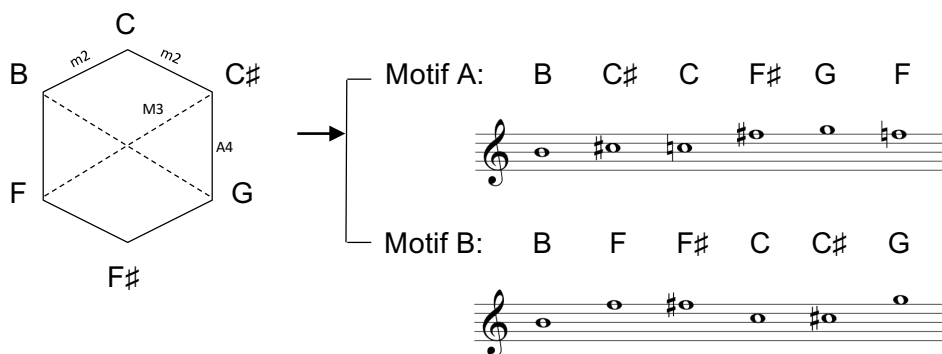
Figure 26. Motif A and Motif B Derived from the Six Note Collection in *Eolgae*

4.2.5. Rhythm: Talea

Taleas are constructed proportionally at the beginning of the planning stage, so they already have mathematical relationships among them. Thus, the stratification and the juxtaposition of these self-similar rhythmic patterns offers active motions to the music, creating tension and repose repeatedly. By using both intervals and rhythms simultaneously or successively, the constant directional quality is yielded. The rhythmic plan in *Eolgae* is inspired by fractals in mathematics. As shown in Figure 27, Talea ① is

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[53] Snowflake Bentley, 'Original Wilson Bentley Image', *http://snowflakebentley.com*, accessed 16 February 2016, http://snowflakebentley.com/00001.htm.

built on a symmetrical structure that is proportional and palindromic. This basic structure yields Talea ④ through retrograde. With the same method, Talea ② and ③ are generated. All four sets of Talea create four subsets of each respectively, except Talea ① that has five subsets, by multiplying and diminishing the note value proportionally. (see Figure 28)

A. Talea ①: Palindrome (Non-retrogradable Rhythm)

B. Talea ④:

C. Talea ②:

D. Talea ③:
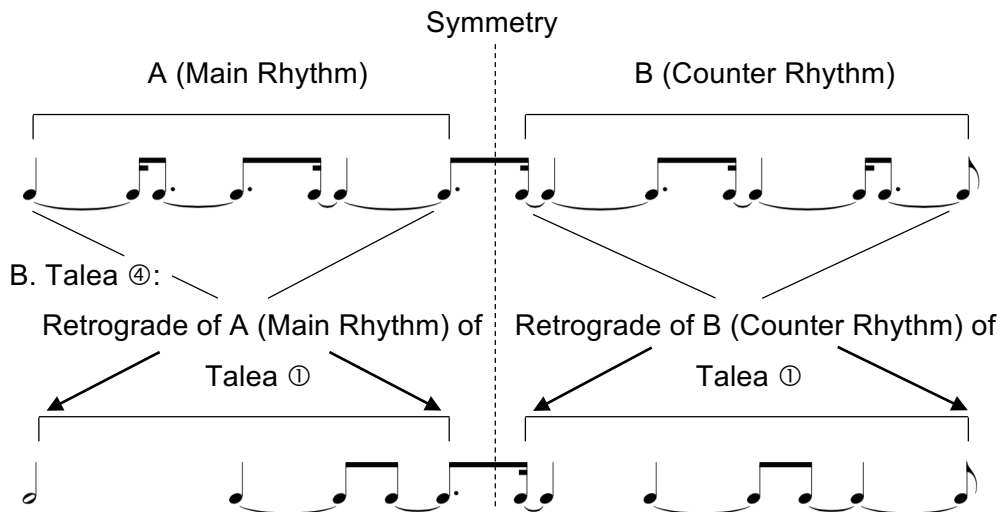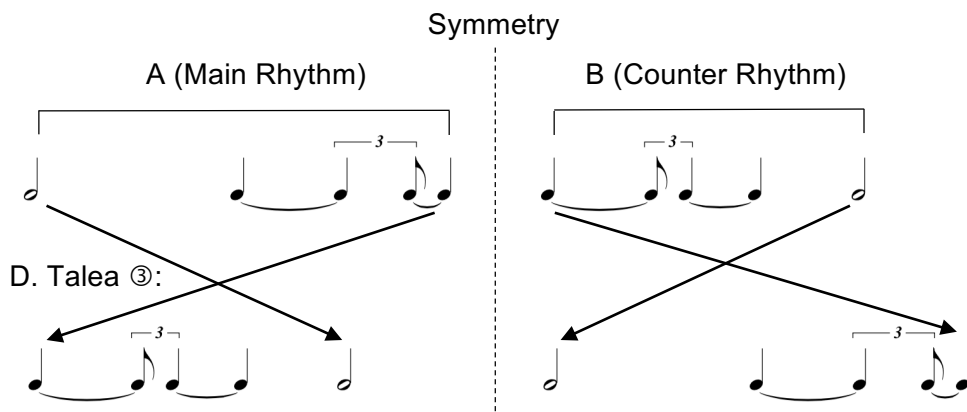
Figure 27. Structure of Talea

This mathematical treatment of the original rhythm of Talea ① contributes to a rhythmic coherence which is innate in the Talea itself. Talea ① and ④ are mostly used in melodic and rhythmic development on lower register instruments, and Talea ② and ③ in melodic and rhythmic development on higher register instruments. Multiple layers, fabricated by the stratification and the juxtaposition of canonic procedures at different time, serve to blur boundaries between melodic, harmonic and rhythmic materials, creating a forward-moving directionality with fluid and shapeless movement. In this process, relationships between

original sets and subsets of Talea become a bonding agent of musical materials, and an essential element to development.
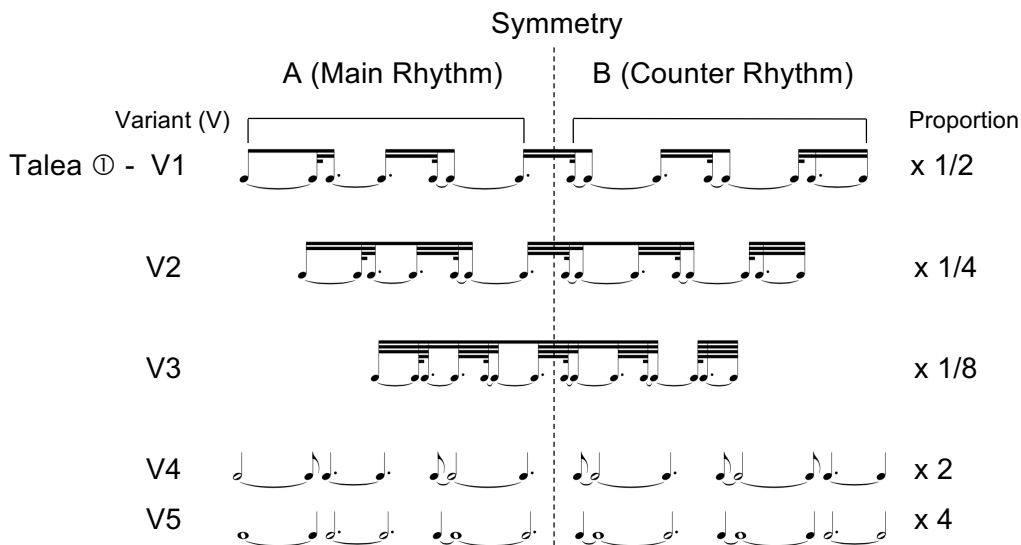
Figure 28. Variants of Talea ①

4.2.6. Structural Transformation

A structural transformation, i.e. a microstructure that becomes a macrostructure, uses a Korean poetic structure in addition to pitch, rhythm and time as a bonding agent. *Eolgae* is based on the structure of Sijo which consists of three lines with an average of 14–16 syllables per line as shown in Table 7.

Line (Korean Term)	Syllables	Structure
1 (Chojang)	3 4 4 4	Introduction
2 (Jungjang)	3 4 4 4	Development
3 (Jongjang)	3 5 4 3 ↑ Twist or Surprise	Conclusion

Table 7. Structure of a Regular Sijo

The first half of the third line of Sijo always includes a twist. This twist is expressed in *Eolgae* by a sudden forte attack in brass, percussion, harp and lower strings (bar 32). The three line structure of Sijo is the basic structure of *Eolgae* which becomes a larger structure of three sections with three sub-sections, apart from the second section which has six sub-sections. (see Figure 29) In general, this self-similar structure adopts the concept of Man-Jung-Sak in tempo as well as in dynamics. Man-Jung-Sak is a concept of speed (tempo) in traditional Korean music; Man is slow, Jung is moderate, and Sak is fast. This gradual change of tempo and dynamics is at the very heart of *Eolgae*, expressing a

constant flow of musical materials. The symmetrical design of pitch and rhythm further develops a structural symmetry by stratification. The motif (F G F♯ C C♯ B) with the rhythmic pattern of Talea ② which is also a palindrome is introduced on the second violin in bars 17–21, employing Jeonseong, Toiseong and Chooseong from Sigimsae, and is distributed successively through a canonic procedure. (see Figure 30) The feature of a palindrome recurs in a different format, for example, on the second violin and viola in bars 25–30 as shown in Figure 31.

Speed:	Man ⟶		Jung ⟶		Sak ⟶		Man		
Line:	Chojang		Jungjang		Jongjang		Chojang		
Form:	**A**			**B**			**A'**		
	A		B		C		A'		
	Man	Jung	Sak	Man	Jung	Sak	Man	Jung	Sak
	Cho	Jung	Jong	Cho	Jung	Jong	Cho	Jung	Jong
	A	B_1	B_2	C	D	E_1	E_2	E_3	F	A'	B_1'	B_2'
Tempo:	30	40	50	60	70	80	90	100	110-120-140	30	40	50-40-30
Dynamic:	pppp	ppp	pp	p	mp	mf	f	ff	fff-ffff	pppp	ppp	pp-ppp-pppp
Bar:	1-14	15-27	28-38	49-81	82-113	114-141	142-159	160-178	179-276	277-290	291-303	304-335
	Spring - - - -▶			Stream - - - -▶			River - - -▶ Sea			Spring (Dormancy)		

Figure 29. Structure of *Eolgae*

Figure 30. *Eolgae*: bars 17–21

Palindrome

Figure 31. Palindrome in the Second Violin and the Viola in *Eolgae*: bars 25–30

There are two types of Sijo Jangdan, 5 and 8 beats. These rhythmic patterns are slightly altered by adding or subtracting the value of quaver.

Line (Korean Term)	Original Rhythmic Pattern	Altered Rhythmic Pattern
1 (Chojang)	5(3 2) 8(3 2 3) 8 5 8	First Time: 5 8 8 5 8
		Second Time: 5 8.5(3 2 3$^1/_2$) 8 5 7.5(3 2 2$^1/_2$)
2 (Jungjang)	5 8 8 5 8	5 8.5(3 2 3$^1/_2$) 7.5(3 2 2$^1/_2$) 5 8
3 (Jongjang)	5 8 5 8	5 8.5(3 2 3$^1/_2$) 5 7.5(3 2 2$^1/_2$)

Addition: 8 (3 2 3) + the value of quaver at the last beat → 8.5 (3 2 3$^1/_2$)
Subtraction: 8 (3 2 3) - the value of quaver at the last beat → 7.5 (3 2 2$^1/_2$)
One beat is equivalent to the value of crotchet.

Table 8. Altered Rhythmic Pattern of Sijo in *Eolgae*

In addition, rhythmic patterns of 5 and 8 beat Jangdans of Sijo in the first line (Chojang) are executed by the percussion groups from bar 2 to bar 14, slightly changing from the original rhythms. (see Figure 32)

This whole process of becoming a large structure from a fragment through the constant transformation of self-similar patterns is similar to the effect of Chaos Theory (or Butterfly Effect). Small drops of water, formed from molecules of one oxygen and two hydrogen atoms, give birth to spring, form a small stream, and then become river and sea topologically. This transformation is the skeleton of *Eolgae*. The interlocking system of a canon intermixes these two different materials, i.e. Sigimsae and Talea, building layers of melodic and rhythmic lines through stratification and juxtaposition, and then transforms

them into one unique entity that creates powerful effects with a constant moving quality analogous to that of water. The visual representation of the score in a smaller scale somewhat exhibits this quality as shown in Figure 33. The entire piece is constructed by stratifying and juxtaposing Taleas simultaneously and successively, so that the structure of the music becomes a cobweb-like texture which is alternately interlocked together, changing rhythms and pitches constantly.

Figure 32. *Eolgae*: bars 2–14
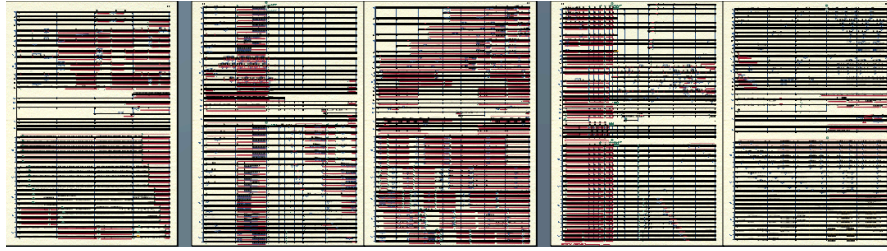
Figure 33. Visual Representation of Forward-moving Directionality in the Score in a Smaller Scale in *Eolgae*: bars 154–190

The fundamental of Formless Form as Forma Efformans is the flexibility of water, and this principle permeates every part of the music, shaping it as a whole as well as evolving into a complete entity of the music itself. Meticulous and detailed inner structures through the application of canon create amorphous effects in sounds as well as shapelessness in form.

5. Animus

Animus for Flute, Clarinet, Violin, Cello and Piano (2015) expresses finite characteristics of the existence of all beings and all things, searching for a path to reach the state of perfection as well as for a true meaning of eternity. Characteristics of the five different states, i.e. Temporalis (Temporary), Chaos (Chaos), Segregationem (Isolation), Ordo (Order) and Aeternus (Eternal), are realised and coloured by moulding and sculpturing sounds that becomes a fundamental of the piece. In order to embed vivid and colourful images of sounds and timbres in the music, four different compositional methods are employed, e.g. athematic voice (or part) writing, liquidation of rhythm, equilibrium of tension and rhythmic cell construction. These were influenced by Reginald Smith Brindle's *Serial Composition* which describes different compositional approaches including the complete liquidation of audibly perceptible metre, athematic writing, tension-flow, satisfactory equilibrium of tension, metrical displacement, rhythmic displacement, numerical proportionalisms and rhythmic cell constructions,[54] and differently applied to *Animus* through my own logical process and more importantly intuitive and artistic processes. Firstly, athematic voice writing avoids traditional thematic development so that different and myriad sounds and timbres of each pitch, harmony and instrument can be emphasised more effectively. Secondly, liquidation of rhythm serves to avoid a regular pulse or beat, and is achieved by metrical and rhythmic displacement. This rhythmic irregularity contributes to metrical obscurity. Thirdly, equilibrium of tension gives rise to neutralisation of the systematic importance of musical materials since there are no recognisable and dominant theme or motif, harmony and rhythm in the music. Hence, the development of the music follows an emotive path and a flow of tension through intensification and repose. Certainly, there are some points where climax and repose are used for contrast in order to prevent a monotonous flow of the music. Lastly, influenced by Luigi Nono's use of numerical proportions in his work *Il Canto Sospeso*[55], rhythmic cell construction provides the music with meticulous structural basis that shapes an overall form of the music during the process of development. To be specific, mathematical treatment to two basic units of rhythmic value, i.e. a demisemiquaver and a semiquaver in a triplet, serves as a rhythmic and structural basis, incorporating with numbers in Pascal's Triangle, Fibonacci sequence, numerical proportion and pre-designed rhythmic cells based on those two basic units of rhythmic value. This approach is also associated with athematic voice writing, contributing to athematic treatment to pitches. Basically, each

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[54] Reginald Smith Brindle, *Serial Composition* (London: Oxford University Press, 1966), 45, 55, 60, 87, 93, 162 and 167.
[55] Ibid., 163–168.

movement is constructed on those two shortest notes except the second and fourth movements that are constructed on pre-designed rhythmic cells based on those two units. All movements are self-contained movements, and there are no direct relations between movements except two basic units of rhythmic value. Most sounds register in two extreme ranges, low and high, and in the last movement *Aeternus*, there is a sound shift from a low to a middle to a high register, concealing the third harmonic (an octave and a perfect fifth above the fundamental). There is no recognisable structure at all apart from a rhythmic mirror, especially in the third movement *Segregationem*. The entire piece follows an emotive path and a flow of tension. *Animus* sings of an unfailing hope for a new sound world despite the present sufferings and troubles.

5.1. Temporalis (Temporary)

The first movement *Temporalis* expresses finite characteristics of beings and things which are temporary, transient, active, nebulous, amorphous and evanescent. Everything on the earth has its limitedness, and this temporary quality is controlled by a flow of tension in the music. In order to embed the temporariness of beings' existence into the music, the repetition of rhythm is avoided. There is no dominant melody, harmony and rhythm. The first movement is full of colourful sounds and timbres which represent the short existence of beings, sometimes in a short, sudden, strong and active movement or sometimes in a gentle and quiet movement. Both all exist for a short period of time. Everything will be gone someday, but there is always a new life and new beginning!

5.1.1. Development

The first movement *Temporalis* uses tone rows and rhythmic fragments based on two basic units of rhythmic value, a demisemiquaver and a semiquaver in a triplet applied to numbers from a diagonal of Pascal's Triangle (Figure 34). The exhaustive use of two basic units as a motivic and rhythmic cell incorporated with numbers from Pascal's Triangle conforms with the finite characteristics of temporariness.

	'O' Matrix										
D	B♭	A	E♭	E	F♯	F	G	C♯	C	A♭	B
B♭	F♯	F	B	C	D	C♯	D♯	A	G♯	E	G
A	F	E	B♭	B	C♯	C	D	G♯	G	E♭	F♯
E♭	B	B♭	E	F	G	F♯	G♯	D	C♯	A	C
E	C	B	F	F♯	G♯	G	A	D♯	D	B♭	C♯
F♯	D	C♯	G	A♭	B♭	A	B	F	E	C	D♯
F	C♯	C	F♯	G	A	A♭	B♭	E	E♭	B	D
G	E♭	D	G♯	A	B	B♭	C	F♯	F	C♯	E
C♯	A	G♯	D	D♯	F	E	F♯	C	B	G	B♭
C	A♭	G	C♯	D	E	E♭	F	B	B♭	F♯	A
A♭	E	E♭	A	B♭	C	B	C♯	G	F♯	D	F
B	G	F♯	C	C♯	D♯	D	E	B♭	A	F	A♭

	'I' Matrix										
D	F♯	G	C♯	C	B♭	B	A	D♯	E	G♯	F
F♯	A♯	B	F	E	D	D♯	C♯	G	G♯	C	A
G	B	C	F♯	F	E♭	E	D	G♯	A	C♯	B
C♯	F	F♯	C	B	A	B♭	A♭	D	E♭	G	E
C	E	F	B	B♭	A♭	A	G	C♯	D	F♯	E♭
B♭	D	D♯	A	G♯	F♯	G	F	B	C	E	C♯
B	D♯	E	B♭	A	G	G♯	F♯	C	C♯	F	D
A	C♯	D	G♯	G	F	F♯	E	B♭	B	D♯	C
D♯	G	G♯	D	C♯	B	C	B♭	E	F	A	F♯
E	G♯	A	D♯	D	C	C♯	B	F	F♯	A♯	G
G♯	C	C♯	G	F♯	E	F	E♭	A	B♭	D	B
F	A	B♭	E	E♭	D♭	D	C	F♯	G	B	G♯

Figure 34. Rhythmic Cell (Fragment) Construction

This segmentation (or fragmentation) process of two basic units as a rhythmic source serves to represent the limitedness of any immaterial (or mental) and physical properties of something such as time, energy, corporeality, human being, plant and so forth. The inner structure of A (bb. 1–16), B (bb. 17–23) and C (bb. 23–51) is constructed on rhythmic mirrors during its development process, and shapes the overall structure of the music at the end which is based on those ever-changing motivic and rhythmic fragments. Even though there is no preeminent harmony in the first movement, a chord consisting of intervals of minor seconds and major third, e.g. C♯ D F♯ G, is a point of departure for *Temporalis*. The recurrence of convergence and divergence of a flow of tension is colouring the music more vividly, emphasizing the finite characteristics of all things in this world. In addition, contrast of colours and timbres of instruments highlights these limited qualities.

5.2. Chaos (Chaos)

The second movement *Chaos* reflects the unstable characteristic of chaos, the state of the absence of order, so the music expresses this quality of instability. This movement is based on contrast of density and sparseness, and follows extreme irregularity of rhythmic configuration through metrical and rhythmic displacement that results in liquidation of

rhythms. This rhythmic displacement serves to intensify a flow of tension that corresponds to the state of chaos

5.2.1. Development

The second movement utilises tone rows (O: C B♭ B A G♯ G C♯ D D♯ F E F♯, I: C D C♯ D♯ E F B B♭ A G G♯ F♯), and from those, forms a very dissonant chord (A B♭ B C) through combining intervals of major and minor seconds as a starting point of harmony. In addition, this movement harnesses the rhythmic cell construction based on two basic rhythmic units and consisting of five different cells and their variants by augmentation and diminution to maximise the rhythmic irregularity.

Figure 35. Rhythmic Cell Construction

5.3. Segregationem (Isolation)

The third movement *Segregationem* expresses the quality of isolation that can be caused by geographical, emotional and social reasons. This movement realises equilibrium of tension in order to represent the emptiness and solitariness of isolation. Several brief breaking points where a flow of the music ceases shortly brings silence into the music denoting this state of segregation and seclusion which is silent, solitary, and desolate.

5.3.1. Development
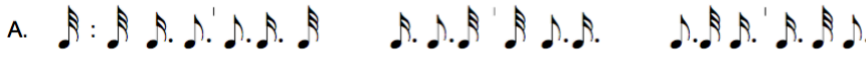
This movement also is based on tone rows (O: D♯ E G♯ F F♯ G B B♭ D C♯ A C, I: D♯ D B♭ C♯ C B G G♯ E F A F♯), and starts with a chord (D♯ E F G♯) consisting of intervals of minor second, and major and minor thirds which are designed to express loneliness. Particularly, the entire structure is constructed on a rhythmic mirror by bar 31 as an axis of this mirror structure. In rhythmic development, numbers (1, 3, 6) from Pascal's Triangle are applied to two basic rhythmic units as shown in Figure 36. This rhythmic design based on numerical proportion as well as mirror structure in it further creates its variants of augmentation and diminution.
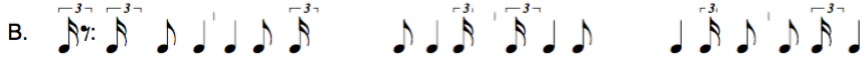
5.4. Ordo (Order)

As the title of the movement suggests, the fourth movement *Ordo* expresses the presence of order which gives rise to stability in the music. This movement represents the characteristic of order that can be illustrated as passionate, energetic and decisive gestures because of the stable quality of order.
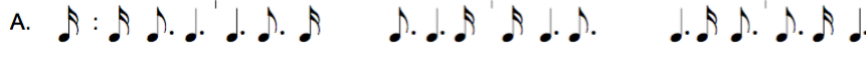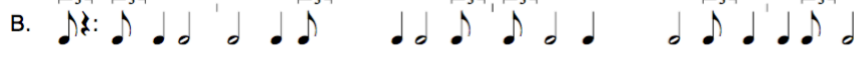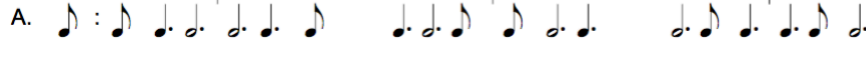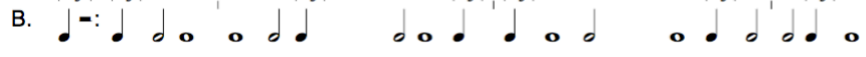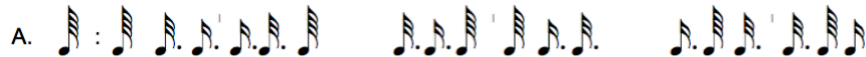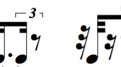
Figure 36. Permutation of numbers from Pascal's Triangle

5.4.1. Development

The fourth movement uses tone rows (O: G C♯ C B♭ A B E F♯ F E♭ D G♯, I: G C♯ D E F E♭ B♭ A♭ A B C F♯), and begins with a chord (G B♭ C C♯) consisting of intervals of major and minor seconds, and minor third which implies the state of stability. Like the second movement, five pre-designed rhythmic cells including their variants of augmentation and diminution are employed and executed with vivid, energetic and enthusiastic spirit and verve.

5.5. Aeternus (Eternal)

The last movement *Aeternus* is an expression of a longing for eternity which is realised by ethereal sounds expressing its static quality to some extent. In particular, the voice for hope for eternity embedded in a third partial (twelfth: an octave + perfect fifth) often appears throughout the movement in an obvious or concealed way within a sound amalgam. In addition, there is a shift of sounds from a low, through a middle, and to a high register. This path of sounds also represents the path of a longing for eternity.

5.5.1. Development

The fifth movement employs tone rows (O: B A D♯ E B♭ G G♯ F♯ F C♯ C D, I: B C♯ G F♯ C E♭ D E F A B♭ A♭), beginning with a chord (D♯ E A B) consisting of intervals of major and minor seconds, and perfect fourth which serves as a tool to convey the quality of repose. The rhythmic cells are constructed on numbers (1, 2, 3, 5, 8, 13, 21) of Fibonacci sequence, and then applied to numbers (2, 6, 1) based on intervals of B A D♯ E (M2 + A4 + m2) to execute these rhythmic cells to the music by multiplication of those numbers.

Multiply by		2	6	1	1	6	2
①		A	B	A	B	A	B
		AA	BBBBBB	A	B	AAAAAA	BB
	a:	1 2	3 5 8 13 21 1	2	3	5 8 13 21 1 2	3 5
	b:	21 13	8 5 3 2 1 21	13	8	5 3 2 1 21 13	8 5
②		B	A	B	A	B	A
		BB	AAAAAA	B	A	BBBBBB	AA
	a:	1 2	3 5 8 13 21 1	2	3	5 8 13 21 1 2	3 5
	b:	21 13	8 5 3 2 1 21	13	8	5 3 2 1 21 13	8 5

Figure 37. Rhythmic Application by Multiplication

6. The Lost Times

The artistic vision for a string quartet *The Lost Times (2015)* was inspired by the vision of a catastrophic disaster which totally destroyed an imaginary city where many people once prospered. This horrifying event, however, was not an ultimate end of life, but a new beginning, reconstructing new life from the ashes of total destruction. There are two main forces in the piece: Light and Darkness which collide violently. This huge collision causes lots of pain and suffering. Nevertheless, a ray of Hope incarnated as a main-tone B suddenly emerges out of nowhere, and gradually takes over the force of darkness, completely overcoming its force with Bright Light at the end. Each movement has a title describing those processes from the destruction to the reconstruction of life, and corresponding to the designated colours. The first movement *Darkness* corresponds to black or blackout, the second movement *Ruins* corresponds to grey, the third movement *Memory of Life* corresponds to red, and the fourth movement *Bright Light* corresponds to white, whiteout, or glare. Life can overcome anything! With love, hope, forgiveness, courage, truth, righteousness, justice, kindness, forbearance, peace, freedom, light, and …. Metric modulation permeates the entire movements.

6.1. Darkness

In the first movement *Darkness*, everything falls into darkness. It is like a black hole and at first glance even it seems that no light can escape from it. This falling is expressed by distinctive descending figures and this complete darkness is coloured by dark, harsh secundal harmony (clusters) often accompanying abrupt changes so that the colour of the movement becomes black.

6.1.1. Development

The first movement utilises tone rows (O: C G♯ C♯ G B F♯ F B♭ E A D E♭, I: C E B F C♯ F♯ G D G♯ D♯ B♭ A), using clusters for the colour of darkness. The structure of the movement inspired by Golden ratio (1.6180339887…) associated with Fibonacci sequence (1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144…) during the structural planning of the movement integrates metric modulation, and non-periodic (irregular) pulsation also associated with numbers of Fibonacci sequence. Important musical changes are happening at the near point where Golden ratio occurs, for example at bars 55:34 (0.61818182). There are four sections as shown in Figure 38. Numbers indicate numbers of bars.

Four Sections:
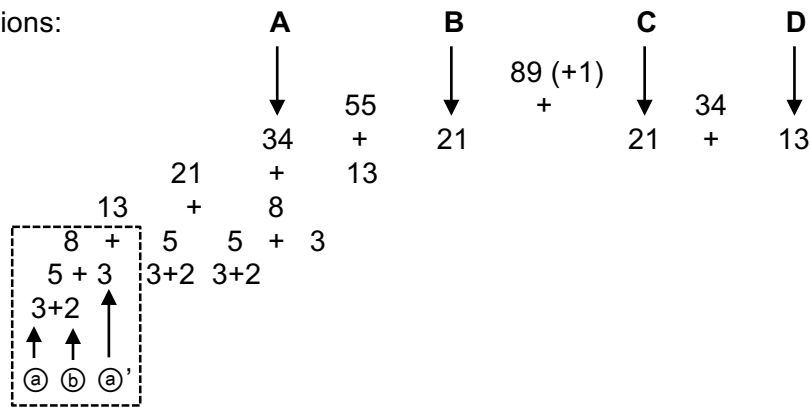
Figure 38. Structure of the First Movement

Only one bar is added for the purpose of a musical effect to this structure after bar 68 which is a grand pause. Basic structural units of bars are 3 as ⓐ and 2 as ⓑ. Unit ⓐ consists of descending melodic (or motivic) figures incorporating numbers of Fibonacci sequence in a rhythmic value of a semiquaver as a basic rhythmic unit through multiplication by its numbers. 8 bar structure in a dashed line rectangle consisting of ⓐ (3 bars), ⓑ (2 bars) and ⓐ' (3 bars) is a basic structure of the first movement, multiplying ⓐ and ⓑ 13 times and ⓐ' 8 times throughout the first movement.

Figure 39. Rhythmic Cell Construction

Unit ⓑ embodies non-periodic pulsation adopting numbers of Fibonacci sequence in a rhythmic development. Both motivic and rhythmic arrangements follow the order of numbers by permutation, e.g. 2, 3, 5, 8, 13, 21, 34 and then 3, 2, 5, 8, 13, 21, 34, etc.

6.2. Ruins

The second movement *Ruins* expresses collapse, a state of total destruction, coloured by mostly quartal harmony which corresponds to grey colour that conveys the images and feelings of feeble and faint status of the ruins from the totally destroyed city by a

catastrophic disaster. This movement is passacaglia based on a bass-ostinato which is a descending figure as the imaginary city was collapsed. This bass-ostinato comprises anhemitonic pentatonic and whole-tone scales that highlight the void mood and status in the aftermath of the total destruction. A bass-ostinato, based on the combination of pentatonic and whole-tone scales, adds modal flavours over a twelve-tone series. This movement also utilises metric modulation.

6.2.1. Development

The second movement employs tone rows (O: C♯ C B F E♭ F♯ E B♭ D G♯ A G, I: C♯ D D♯ A B G♯ A♯ E C F♯ F G), and the structure of the movement is inspired by numbers (1, 3, 5, 7, 17, 51, 85…)[56] from Sierpinski Triangle derived from Pascal's Triangle.[57] Sierpinski Triangle is a fractal with self-similar patterns of an equilateral triangle.[58] In general, there are three sections based on numbers (3, 5, 7) from Sierpinski Trianle.

A	B	C
17 (5+5+5+2)	17 + 17	17 + 17
(5x3) + 2 = 17 +	34 +	34
51	+	34
	85	

In addition, numbers from Sierpinski Triangle serve to design melodic and rhythmic non-periodic pulsation units. There are three basic units of rhythmic value consisting of a semiquaver, a semiquaver in a quintuplet, and a semiquaver in a triplet. (see Figure 40) The duration of units serves as a basis for motivic (melodic) development, and a number of units serves as a basis for rhythmic development, i.e. non-periodic pulsation.

6.3. Memory of Life

The third movement *Memory of Life* forecasts the new birth of life from the ashes of a total destruction, remembering memories and strong feelings about beautiful life in the past that triggers heartbeats of lives once again. A sign of this new life and heartbeats are embedded in number 7 and sometimes 28, its multiplication by 4. This reconstruction of

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
[56] Binary numbers and the results in Sierpinski Triangle, replacing all odd numbers as 1 and all even numbers as 0 in Pascal's Triangle:
1 = 1, 1 1 = 3, 1 0 1 = 5, 1 1 1 1 = 15, 1 0 0 0 1 = 17, 1 1 0 0 1 1 = 51, 1 0 1 0 1 0 1 = 85, etc.
Wolfram MathWorld, 'Sierpiński Sieve', *http://mathworld.wolfram.com*, accessed 11 June 2016, http://mathworld.wolfram.com/SierpinskiSieve.html.
[57] Ibid.
[58] Wikipedia, 'Sierpinski Triangle', *https://en.wikipedia.org/wiki/Main_Page*, accessed 11 June 2016, https://en.wikipedia.org/wiki/Sierpinski_triangle.

life is coloured by red which denotes blood in lives. The vitality of life is still active, not dead, and life is greater than destruction. This vitality of life is expressed by ostinato which permeates through pizzicato by all instruments in the movement. In this movement, guitar-playing techniques are utilised for this vibrant colour, timbre, and movement with verve. The music ends with a humorous mood denoting the humour in life which provides a flow of the music with a sense of relieve.

Figure 40. Rhythmic Cell Construction

6.3.1. Development

The third movement is governed by a multi-octave scale with quasi-tertian harmonic flavours using seventh or ninth chords in order to obscure a direct indication of tonality as shown in Figure 41. Also, to avoid the obvious tonal colour, serial music flavours are added to a motivic (melodic) and thematic development. This multi-octave scale generates major and minor triad chords as well as a quartal chord. Ostinato repeated 35 times throughout the movement combines with descending and ascending figures from a multi-octave scale, adopting a rhythmic pattern (3+2+2+3), one of deviate rhythms from

typical Utmori (3+2+3+2), traditional Korean rhythm. The descending and ascending figures of ostinato denotes the new birth of life. Pulsation by every seventh quaver incorporated with a deviate Utmori rhythm (3+2+2+3) appears constantly, contrasting with other instruments that start at a different point with the same pulsation to displace the periodic rhythmic pulse. This rhythmic displacement serves to bring the vitality of life as well as the impression of irregularity by the active movements to the music.

C D♭ E♭ F♯ / G A♭ B♭ C♯ // D E♭ F G♯ / A B♭ C D♯ // E F G B♭ / B C D F //

F♯ G A C / C♯ D E G // G♯ A B D / D♯ E F♯ A // B♭ B C♯ E / F G♭ A♭ B

Figure 41. Multi-Octave Scale by Tetrachord (minor second + major second + augmented second) Repeating at the Fifth

6.4. Bright Light: Light cannot be overcome by darkness.

The fourth movement tells a short story about battles between two opposite forces: Light and Darkness. The battle begins with a big collision which leads to constant battles and struggles causing pain, sorrow and slump. However, Bright Light as a sign of Hope suddenly appears and gradually and completely triumphs over Darkness, achieving an ultimate victory at the end of the battles. These battles are coloured by vivid sounds, timbres and rhythms. Luminous and radiant sounds of this movement corresponds to the colour white that denotes hope, light, peace and victory. A main-tone B symbolising a ray of Hope appears throughout the movement. An overall structure of the movement is inspired by numbers of Fibonacci sequence (1, 1, 2, 3, 5, 8, 13, 21, 34, 55…), e.g. Section A: 12 bars, Section B: 34 bars, Section C: 21 bars, Section D: 21 bars, and Section E: 43 bars. Number 8 briefly plays as a basis of pulsation. Moreover, this movement utilises Jajinmori, traditional Korean rhythm, incorporating with colotomic structure and drone.

6.4.1. Development

There are two main tone rows which consist of two identical hexachords (tetrachord + two added pitches) respectively, and assigned to two opposite forces: Light and Darkness.

These two opposite forces are also assigned to two different groups of instruments, e.g. two violins for Light, and viola and cello for Darkness.

6.4.2. Section A: Collision of Two Opposite Forces: Light and Darkness

Section A expresses a big collision of Light and Darkness, and this collision is coloured by harsh and metallic sounds and timbres. A main-tone B as a ray of Hope is concealed in this collision. Two tetrachords denoting Light and Darkness are introduced as a collision at the very beginning of the movement. Tetrachord (meaning any four note segment of a tone row hereafter) for Light consists of F♯ B♭ B C, and tetrachord for Darkness consists of G G♯ C♯ D. Especially, dyad of C♯ and G symbolising the force of Darkness appears as a drone-like figure until this dark force is overcome by Light and dies away.

6.4.3. Section B: Battles and Struggles

The sounds of this section are quite colourful and vivid with energetic rhythms since the purpose of these battles and struggles is for a victory, not for a defeat. The rhythmic development is inspired by a colotomic structure from East Asian music, especially from Gamelan music of Java and Bali in Indonesia, and a drone from African music. These two styles are transformed in the music by incorporating with one of rhythmic patterns from Jajinmori, e.g. A: 3+3+3+3, B: 2+2+2+2+2+2, C: 3+3+2+2+2, D: 2+2+2+3+3, and E: 3+2+2+2+3. One of each rhythmic pattern is assigned to each instrument respectively repeating eight times, and played simultaneously. Number 8 is from Fibonacci sequence.

Violin I	A x 8 → C x 8 → D x 8 → E x 8
Violin II	B x 8 → D x 8 → E x 8 → C x 8
Viola	C x 8 → E x 8 → B x 8 → A x 8
Cello	C x 8 → E x 8 → B x 8 → A x 8

These dynamic changes of rhythms illustrate the intensity and cruelty of battles as well as the shout for hope and light.

6.4.4. Section C: Pain and Slump: Stagnation

This section describes pain and sorrow through a short cadenza-like figure by the first violin after the introduction of dominance, hostility and aggressiveness of Darkness by cello. This pain is also illustrated by sudden pulses consisting of multiplication of a semiquaver as a basic unit by number 8, e.g. 2 x 8 on Violin I, 3 x 5 on Violin II, 5 x 3 on

Viola, and 8 x 2 on Cello from bar 57 to bar 60. This sudden pulsation denotes heartbeats of lives who are in pain.

6.4.5. Section D: Bright Light

After long and violent battles, Bright Light suddenly appears out of nowhere and gradually conquers the force of Darkness through annihilation of Darkness by Light appeared as a main-tone B in bars 76–79. During this annihilation process, Bright Light overcomes the force of Darkness completely, and Darkness is totally vanished at the end.

6.4.6. Section E: Victory of Light

Section E is a song of victory. This joyful and glorious moment is vividly and triumphantly expressed by quite intuitive yet spirited rhythms (bb. 98–106), briefly employing pulsation by number 8 in a triplet with the recurrence of a main-tone B as a ray of Hope in violins at the end. The last movement ends triumphantly, proclaiming that Light cannot be overcome by Darkness!

Conclusion

My music expresses unfailing Hope and Light as well as undaunted human spirit and courage. Everything on earth comes and goes someday. Like the decay of a plant, everything dies away slowly or suddenly. But, that is not the end of life! There is always new birth of life from the residue or the ashes following total destruction. A fragment undergoes a plant-like process from decay to revitalisation, constantly changing itself every time it recurs. Fragments can become transformed as a part of a whole, creating colourful images and dynamic movements in the music. Fragments play a key role as a musical and structural basis to precisely construct a detailed inner structure and then to interweave this meticulously detailed inner structure to build the overall structure of the music. This refined overall structure can be either formless (shapeless) or formed (shaped) according to a musical flow and need which is every so often quite intuitive. Thus, an ever-changing fragment often integrated with Sigimsae and a main-tone, is a vital means to realise my musical idea, creative imagination and artistic vision. The exhaustive use of an ever-changing fragment consolidates a unique sound formation process that moulds and sculptures the vivid sounds of my music significantly. An ever-changing fragment evolves throughout my music and never ceases its transformation to explore and create a new sound world. Imagination touches fundamentals and principles in music!

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