UCSD Department of Music

PhD Qualifying Examination
in
Composition

For

Yihsien Chen

February 20, 2019

Oral Examination
Monday, March 11, 2019
9:30 am
Conrad Prebys Music Center, Room 231

PhD Qualifying Exam Question I
for **Yihsien Chen**
Submitted by
Professor Lei Liang, Chair

Calligraphy is considered by many to be the foundation of many art forms in Asia, including literati music and paintings. Please examine the relationship between calligraphy and music, and cite specific musical examples, from both traditional and contemporary repertoire.

PhD Qualifying Exam Question II
for **Yihsien Chen**
Submitted by
Professor Anthony Burr

You've been working on how different composers over the last 50 years have explored the notion of environmental sound. Using Pierre Schaeffer's work in musique concrete as a jumping off point, explore of the range of possibilities: from the incorporation of recordings of the environment, to instrumental imitations of the sounds of nature, compositions that model a kind of ecological relationship between instruments or performers. You might consider composers such as John Luther Adams, Toru Takemitsu, R Murray Schafer and Pierre Schaeffer. In examining music where recordings are used, consider the varieties of representation that are present.

PhD Qualifying Exam Question III
for **Yihsien Chen**
Submitted by
Professor Shahrokh Yadegari

Present your research on the concept of heterophony and its use in your musical practice. Include the history of this concept in historical formation, performance, and teaching of the traditional music of China and Taiwan, paying special attention to the structural role of poetry and text. Finally discuss examples of the presence and use of this concept in the modern music of the West and how you have synthesized and employed such manifestations in your own music.

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Response to Question I

Chinese calligraphy is recognized as an important art form in China. It is also frequently considered to be the foundation of other art forms in Asia. The uniqueness of its beauty lies in the continuous change and the fluid shape of the calligraphic line. When an experienced scholar views a calligraphic work, he or she is able to sense the flow of the vibrant linear gestures and dynamic variation in each brushstroke. With this idea, some composers are greatly inspired and influenced by calligraphy and have created many works based on its principles and techniques. For example, *The Points* for solo pipa (1991), composed by Chinese composer, Chen Yi (1953 -), is based on the idea of the eight brush stroke movements of the Chinese character "*yong*" (永). Also, the Chinese composer, Jia, Daqun (1955 -), has composed the chamber orchestra work, *The Three Images from Ink-Wash Painting* (2005), to depict the finer nuances of Chinese traditional painting. There are three movements of this work, each of which is focusing on the specific technique of ink-painting – *Gong Bi* 工筆 (the technique of highly detailed brushstroke), Jin Ran 浸染 (the technique of delicate dip-dye images), and Po Mo 潑墨 (the technique of splashed ink).[1]

In this study, I will introduce how the composers, including Chou Wen-chung, Toshio Hosokawa, and Lei Liang, transform the art of calligraphy into their sonic worlds through the manipulation of various musical elements. I will approach to this topic by first revealing how the art of calligraphy influences their compositional ideas. Then, I will further proceed to focus on the musical compositions composed by Toshio Hosokawa (1955 -), Chou Wen-chung (1923 -) and Lei Liang (1972 -). Also, it is very important to talk the relationship between calligraphy and Chinese literati musical instrument, guqin. The relationship between calligraphic brushstroke and

[1] Liner note to *Chamber Works* by Jia, Daqun, Franklin, Tennessee: Naxos Regular CD (2015).

the finger technique of guqin will be meticulously examined before I move to the musical works of Chou, Wen-chung and Lei Liang.

The musical works created by Chou and Liang have been widely recognized as the meaningful and beautiful fusion of calligraphy and music. In Chou's works, I will analyze his *Cursive* for piano and flute (1962) and *Pien* for wind ensemble, piano and percussion (1966), to reveal how the idea of calligraphy is manifested through the organization of his highly strict pitch theory, variable mode. Following these outstanding approaches, the idea of one-note polyphony created by Liang is a very important technique to represent the art of calligraphy. In his music, one could even perceive the flow of the calligraphic movement in each single sound. Liang's work, *Brush-stroke* for chamber orchestra (2004) will be analyzed to reveal his approach to the integration of calligraphic principles into music.

Unlike Chou and Liang, Toshio Hosokawa, Japanese-born German composer, doesn't literally translate the calligraphic principles into each musical parameter. Rather, he treats calligraphy as the important metaphor in his works to try to evoke its beauty of line. This idea might be influenced from his teacher, Isang Yun (1917-1995), Korean-born German composer, who observed the attribute of complementary forces in the calligraphic line and had applied this idea to create his technique, *Hauptton*, to express the movement of line in the sound. With this inspiration from his teacher, Hosokawa also includes the idea of breathing pattern of calligrapher as the important element to shape that linear trajectory. In the first part of this topic, I will briefly analyze Hosokawa's work, *Vertical Song* I (1995) for solo flute, to see how the art of calligraphy is represented in the musical work.

The Calligraphic Line in the Music of Toshio Hosokawa

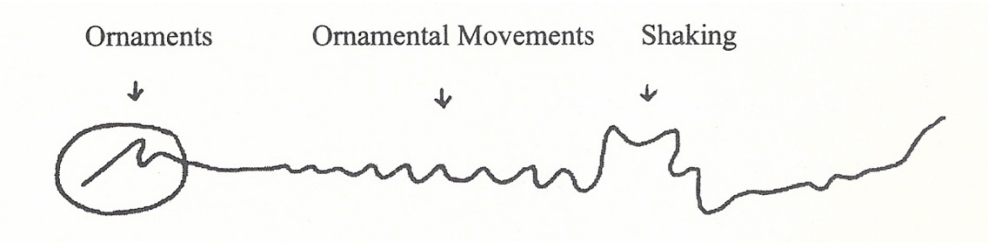
The idea of "calligraphy of sound" is the recurring theme throughout Hosokawa's compositional output. With calligraphy as inspiration, Hosokawa is interested in exploring the

intimate relationship between the calligrapher and the lines he draws on the canvas. This idea leads his compositional approach to the unique position which is different from the theory of Hauptton invented by his mentor, Isang Yun (1917-1995).[2] Hosokawa writes:[3]

> In one stroke of the writing brush appears the breath of life, the power and depth of the person who draws the stroke. It is an expression of the original power of life, and it is proof that the person lives. If the brushstroke of my music differs from that of Isang Yun, it might be in the attention my calligraphy pays to the place on which the stroke is drawn, to the canvas and its blank spaces, under the deeper influence of Japanese calligraphy. Japanese calligraphy places value not only on the subject being drawn but also on the blank space behind it, the power of the space in its background where nothing is drawn

Yun pays the particular attention on the formation of the written calligraphic line itself. The technique of *Hauptton* is invented to respond to his need of creating the musical line based on the art of brushstroke. The following Figure 1 shows the sketch of Yun's design of Hauptton in the graphic and linear way: [4]

Figure 1



Hosokawa observes that the concept of calligraphic line is not only merely comprised of the flow of ink, movement, and thickness, but the breathing of calligrapher is also involved in the overall formation and expression of the line. The line left on the paper implies the breathing and emotion of the calligrapher, in which viewers could perceive its kinesthetic quality and

[2] Isang Yun conceives the idea of Hauptton, literally means central note, in his music. The technique of Hauptton is comprised of three important stage in the musical line: 1. Beginning of the main tone with a slight ornamentation 2. Development of the line (with various kinds of vibratos, glissandi, and ornamentation) based on the single tone, 3. Fading of the tone.

[3] Liner Notes to *Flute Music* by Toshio Hosokawa, Hong Kong: Naxos, p2010 (2008).

[4] Lee, Youn Joo, East and West: Exploring the Sound Word of Isang Yun through an Analysis of *Piri* for Solo Oboe. (Dissertation from Indiana University Jacobs School of Music), 2016, p. 48.

vividness. So, the experience of viewing a calligraphic work or ink-painting is always unique and different from that of viewing the Western painting. Furthermore, Hosokawa also learned the idea of circular movement from the Zen master he met while staying in Japan many years ago: [5]

> Calligraphy is a circular movement that begins from a point at the base of chaos and returns to that point. You don't immediately start drawing on the white paper. First you concentrate your mind and set a starting point in the air. You start to draw your line from that point, pass through the white canvas, and return to it. This set of movements is calligraphy, and the line that was left on the paper is just a part of these movements. The visible line that was left on the paper suggests the invisible world. A large world is hidden behind the visible line.

This viewpoint strongly inspires Hosokawa and leads him to consider about the relationship between sound and silence. He believes that the silence and sound in music conceive the idea of circular movement which is similar to that of calligraphy. In the article, *A Calligraphy Sound,* Hosokawa gives the example of Japanese tsuzumi performer (the hand drum performer) of Noh to demonstrate the moment that circular movement occurs in music: when the performer extends his arm forward to strike the drum, the feeling of tension in the silence is created. The slow movement of drummer's hand implies the vibrant sonority that is about to sound. After the sound recedes to the silence, the performer will start again to extend his arm to prepare the second hit. [6] The circular movement from this example is comprised both of the tension of silence and the resonance of sound. Likewise, the invisible world behind the line, on the other hand, is corresponded to the silence in music. With this viewpoint, I would like to briefly analyze the work of Hosokawa to see how he relates his musical idea to this idea.

I. Brief Analysis on Vertical Song I

The *Vertical Song* I is the flute solo work commissioned by Roberto Fabbriciano, the Italian flutist. Hosokawa says of piece: I looked not for a song which developed by stretching out

[5] Toshio Hosokawa, Calligraphy of Sound (creating a place of sound an silence), Ircam-centre Pompidou, 2017, p. 6.
[6] Ibid., p. 6.

each individual note horizontally but for a song which tried to rise up vertically above time. The idea of vertical sound is also derived from Hosokawa's inspiration of calligraphy. He writes:

> Drive each note as if driving in a pile into time. I called such way of musical time, Vertical Time, and this time continues despite its incontinuity. While vertically drawing a circle, a new life is born at every rotation. A sound that strongly rips through space and time. A calligraphy is drawn at the dimension that opens there.

With his intuitive observation, Hosokawa pays particular attention on the formation of the line in calligraphic work. Each line is born within the circular movement in which every starting point of the overall movement is from calligrapher's mind. In the concept of vertical time, Hosokawa touches the most inner depths of the line and sound. The sound he wants to create is not the mere expression of superficial emotion, but the one that comes from the point of vertical depths in the calligrapher's mind. To examine the calligraphic metaphor in *Vertical Song* I, I will analyze this work based on his way of organizing the silence, unpitched, half-pitched, and pitched sound materials. The following Table 1 shows the overall structural design of *Vertical Song* I with the indication of the arrangement of silence.

Table 1 – The structure of *Vertical Song* I

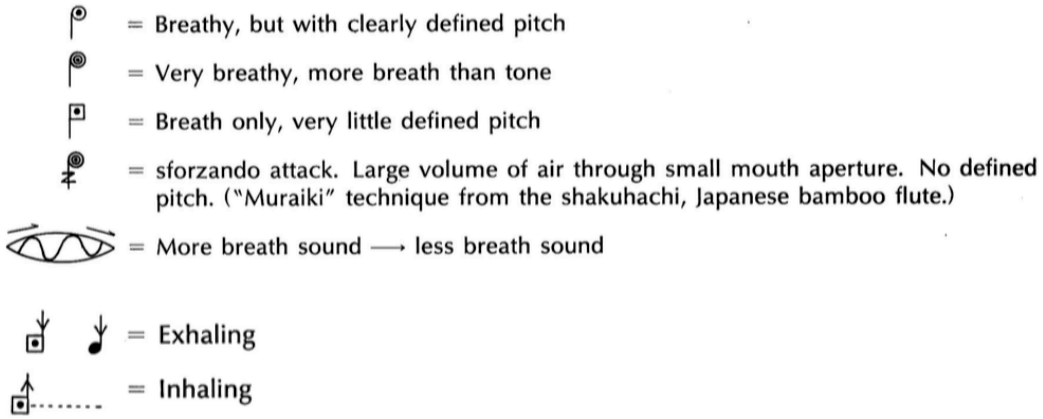
Sections	**Brief Content**	**The arrangement of silence**
First Section (mm. 1-20)	The exposition of the thematic line (comprised of twelve-tone series) and the introduction of the extended techniques.	Starting with silence.
		Ending with the silence of 5~7 seconds at m. 20.
Second Section (mm. 21-44)	The repetition of the same twelve-tone series, but with different timbral configuration.	Ending with the silence of 6~8 seconds at m. 36.
Third Section (mm. 45-57)	Focusing the development of large-leaps figures with increasing speed and the density of the texture.	No explicit silence inserted within sections.
Fourth Section (mm. 58-93)	Ending passage with the large use of breathing technique.	Ending with a short silence at m. 93.

Those long silences that happen at the point between each section may indicate the idea of circular movement. The thematic line is born from the world of silence which is also the place

that the composer sets the sound to recede. Except for the end of the third section, other sections are assigned with the silences before starting the thematic line. While this such long silence only appears nearly three times throughout the whole piece, other materials, such as airy noise and the unpitched sound, are also possible to be perceived as the extension of silence.

In his most flute works, the timbre of breathy sound is always the important part of the overall musical line. As the performance note has shown (See Figure 2), there are even seven types of breathy sounds, each of which suggest different levels of breathy effect and the ways about how the performer generates it with exhaling and inhaling. [7]

Figure 2

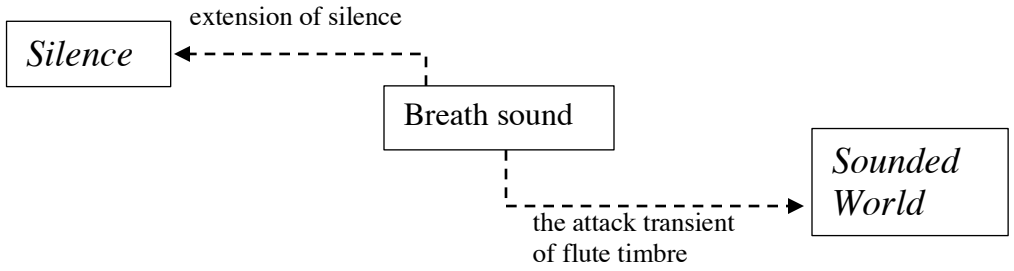


In the envelope of flute timbre, its attack transient, which is the crucial part for listener to identify the timbre, is mostly comprised of breathy noise. Hosokawa tries to extend this part to treat it as an important individual sonic material against the pitched sound. The breathy sound is actually at the middle point between the sounded world of flute and the silence. This idea brings the multiplicity of meaning to the breathy sound that it could be recognized as the part of silence as well as the head part of flute timbre. At this point, this airy noise actually becomes an important part that serves to communicate silence and sound world, which bridges them to form

[7] Toshio Hosokawa, the program note of *Vertical Song I*.

the circular movement. The following Figure 2 shows the interaction within breathy sound, sound world, and silence.

Figure 3



As we could see in Figure 3, the breathy sound is the contact point that touches the world of silence. The dynamic change and timbral variation in this breathy sound also delineate the ebb and flow of the connection between the silence and sound. Hence, as abovementioned, the breathy sound that intersperses among the musical lines may suggest the smaller circular movement correlated with the progression of the notes.

Also, the musical line in which so many timbral variations and dynamic flows are interwoven together is analogous to the line of calligraphy. Hosokawa writes: Lines made by the brush stroke are not straight, but have delicate curves formed in different shades of ink.[8] In addition to the subtle change of ink colors, a calligrapher may move his arm and elbow to control the direction of lines of the character, or make a short pause to take a breath in order to proceed to the other part of character. These actions are all intensely arranged by the calligrapher with careful control of the time. The following Figure 4 shows the calligraphic work written by Masanori Taki whom Hosokawa very admires (The standard form of this character is shown at the next).[9]

[8] Liner Notes to *Flute Music* by Toshio Hosokawa.
[9] Toshio Hosokawa, Calligraphy of Sound, p. 5.

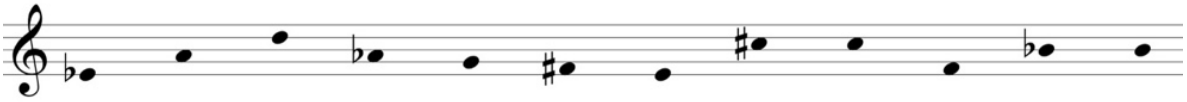
Figure 4 – the character in this work means kokoro, heart, in Japanese

The standard form the character, kokoro.

According to Hosokawa, this character was written in one breath by putting a lot ink on a large brush. We could see that the stroke in this work is not merely the line, but its flow, shape, rhythm, and momentum altogether form the unique beauty of this calligraphy.

Taking this analogy to examine *Vertical Song* I, I will first analyze the combination of timbral materials with the progression of twelve tone series. As Table 1 has shown, the first section is comprised of the exposition of the complete twelve tone series. The extended techniques, such as breathy effect, singing, key slap, etc., are all presented with this twelve tone series. The following Example 1 shows the twelve tone series of *Vertical Song I*.

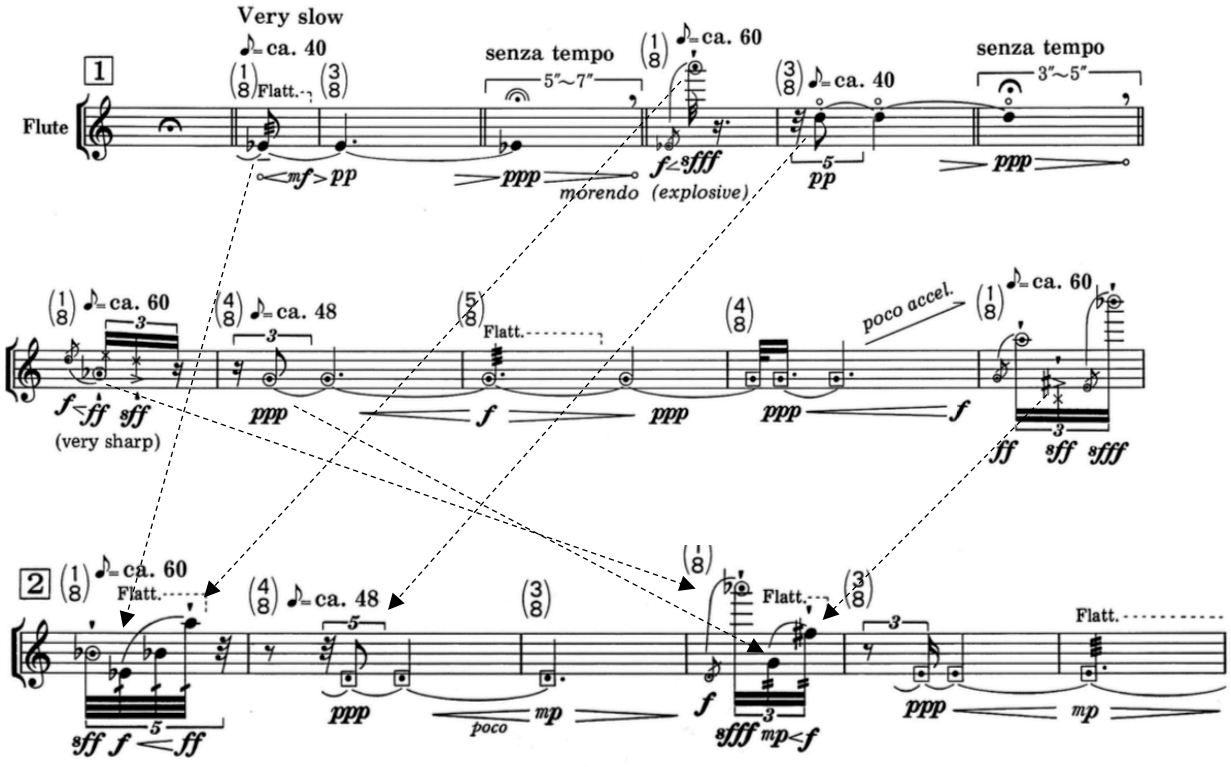
Example 1 – Twelve tone series of *Vertical Song I*



While the technique of twelve tone series is usually recognize as the essential element of serial music, Hosokawa doesn't strictly follow its discipline to convey his musical idea. Rather, he uses this pitch setting as the foundation and gesticulates it with extended techniques to represent the idea of calligraphic line. The following Example 2 shows the first hexachord of the

twelve tone series in the beginning of the first section and the second section so that we could see how Hosokawa gesticulates it with different extended techniques.

Example 2 – the beginning of the first section

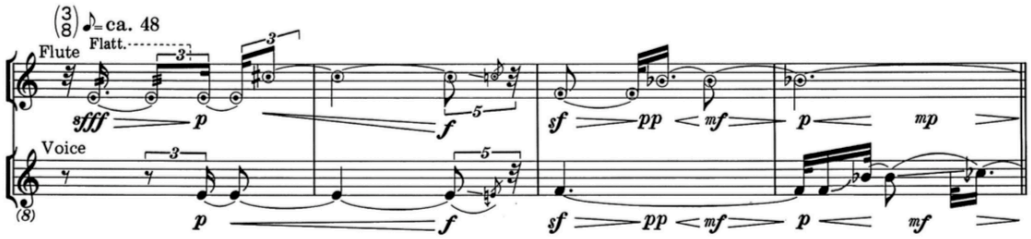


Example 2b – the beginning of the second section

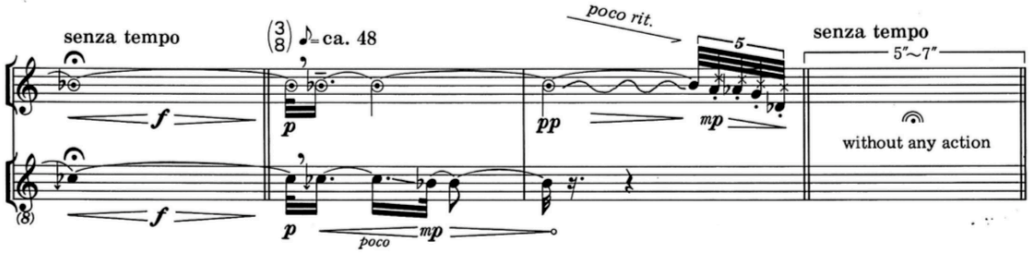
The breathy sounds in these two sections are all followed by an outburst large-leap figures. This idea might evoke the idea that the breathy sound is like a preparation for the quick and thick stroke of the calligraphic line. Having presented the breathy sounds in this way, Hosokawa introduces the other extended technique, vocal sound, which is the opposite of the airy noise. The interplay between the vocal sound and the breathy sound in this part delineates the relationship between calligrapher and the line he draws on the paper. (See Example 3)

Example 3 – mm. 13-19

Breathy sound represents the calligraphic line formed in the mind of calligrapher



Vocal sound represents the line that is written on the paper



Obviously, the vocal part isn't synchronized with the flute part. Rather, the vocal line follows the breathy pitches, which forms a rough imitation. This may suggest that how the calligrapher is trying to regulate his breathing and the balance of arm to draw the line. Before the brush meets the paper, the shapes of the line is already formed in calligrapher's mind. What he does is to follow his own mind and then naturally bring the lines to the paper. Therefore, the breathy sound of flute part may be viewed as the thinking of calligrapher, indicating that how he structures the line in the mind, whereas the vocal part may be analogous to the line that calligrapher draws on the paper. This part forms the second hexachord of the twelve tone series.

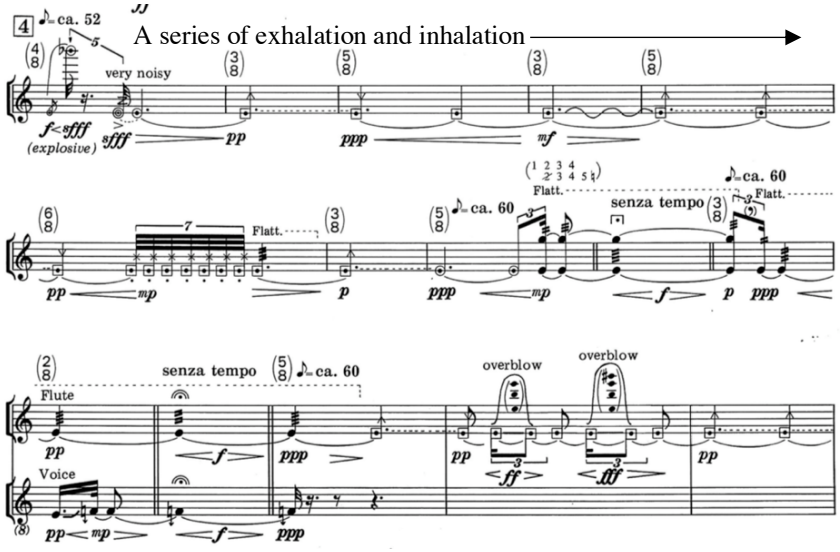
The exhalation and inhalation are also the important extended techniques in this piece. It represents Hosokawa's inspiration about how breathing conceives of the concept of life and death. He writes: [10]

> Life and death are conceived in one breath. Here lies the source of Eastern concept of time; A world is created at every breath, and disappears. Time is born at every second and dies. That is different than the Western concept of time that is straight and horizontally extends forever. I wish to draw a calligraphy of sound on such canvas of musical time.

[10] Toshio Hosokawa, Calligraphy of Sound (creating a place of sound an silence), p. 8.

The technique of breathing is widely used throughout this piece. Usually, it may be also followed by an outburst of large-leap figure, multiphonics, or the technique of overblow. Its flow of air direction changes the timbre of breathy sound and the dynamic fluctuation, strongly indicating the moment when calligrapher concentrates the mind by regulating his breathing pattern before executing a very intense stroke. For example, at the beginning of the fourth section, the long passages of E goes with a succession of exhalation and inhalation, then proceeds to the part of overblowing. (See Example 4)

Example 4



Here, the timbre of overblow forms a striking contrast with the breathy sound. The outburst of harmonic series, resulting from overblowing the embouchure, suggests the powerful release from calligrapher's long preparation of breathing practice. In the music of Hosokawa, his focus on the process of drawing the line on the canvas reveals a very interesting side of the art of calligraphy.

Likewise, the idea of calligraphy could be discerned in the ancient literati music of China. In the next section, I want to focus on the music of guqin, the seven-string zither, to examine its relationship with calligraphy. In this study, it provides the foundation for me to progress to the discussion of the musical works created by Chou and Liang.

The Manifestation of Brushstroke in Guqin

As Chiang Yee points out, the history of Chinese calligraphy is believed to be as long as that of China herself.[11] Likewise, the record about the existence of guqin, or qin, could be dated back as early as Han dynasty (BC. 202-AC. 220). The source about the time was found to be recorded in the notable treatise, *Qin Cao* (*Guide to Qin Music*) written by Cai Yong (133-192), a guqin performer and professional calligrapher.[12] The music of guqin has been recognized by the scholars as the instrument that could best represent the art of calligraphy because there are so many common elements shared by Chinese calligraphy and guqin. In fact, the research about the comparison between the music of guqin and calligraphy has been done by some scholars. For example, the ethnomusicologist and guqin performer, Yip, Ming-Mei, provides a very impressive and compelling analysis on the correlation between the finger gesture of guqin and the gesture of brushstroke technique.[13] As Yip refers, the concept of gesture is the basic unit for both arts of guqin and calligraphy. In guqin, the ancient treatise called *The collection of Tai-Yin* is the book about how to correctly execute the finger technique of guqin. There is an interesting sentence in the preface of this book that I want to freely translate as follows: The ancient people noted down the character when they heard the sound. The gesture of finger is also symbolized by the natural object.[14] In this book, each finger gesture is introduced by using a painting of the natural object, such as animals and plants, to serve as the reference for beginners to learn the technique (See the Figure 1 below).

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[11] Chiang Yee, Chinese Calligraphy, p. 1

[12] *Guide to Qin Music* is the richest survived monograph in the ancient time on the scholarship of qin. It contains commentary of over fifty qin compositions and texts of qin songs. This introduction is directly quoted from *Glossary of the Art of Guqin* written by Cai Liangyu.

[13] Yip, Ming-Mei, *The Art of Guqin Music*, Taiwan: The Commercial Press in Taiwan, 1992.

[14] Original text:古人因聲而譜字，以手勢而象物. Quoted by Yip in The Art of Guqin Music, p. 114.

Figure 1 – the gesture of finger technique, *cuo*,[15] is analogous to the flying dragon

Likewise, in calligraphy, each stroke is always referred as the specific natural object by ancient scholars. For example, Cai Yung said of brushstroke: "To structure the body of Chinese character, we need to find its symbol for the natural object. For example, it might be like the shape of bird…".[16] Thus, Ancient people were able to employ the gesture of the natural object to conceive the gesture of brushstroke and the finger technique of guqin. In Yip's analysis, she compares each finger gesture with a particular brushstroke to indicate how the music of guqin is related to calligraphy. I briefly list the table as follows:

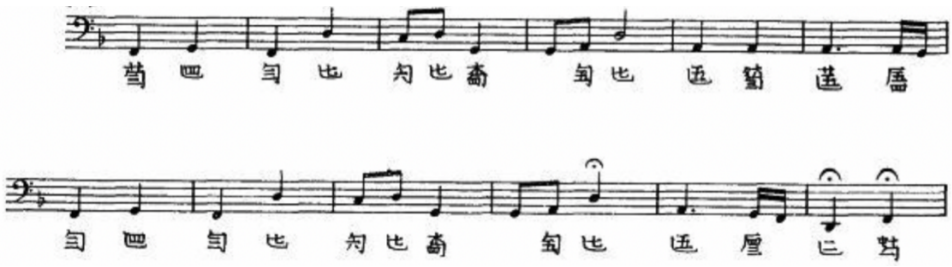
Table 2.

Brushstroke	Finger Technique
Types of the stroke: 1. Main stroke 2. Hook stroke	Techniques of vibration (left hand) that could be analogous to the hook stroke: 1. *Yin* (micro vibration) 2. *Nao* (larger vibration) 3. *Chuo* (slight portamento)
	Techniques of plucking strings(right hand) that could be analogous to main stroke: 1. With nail 2. Without nail

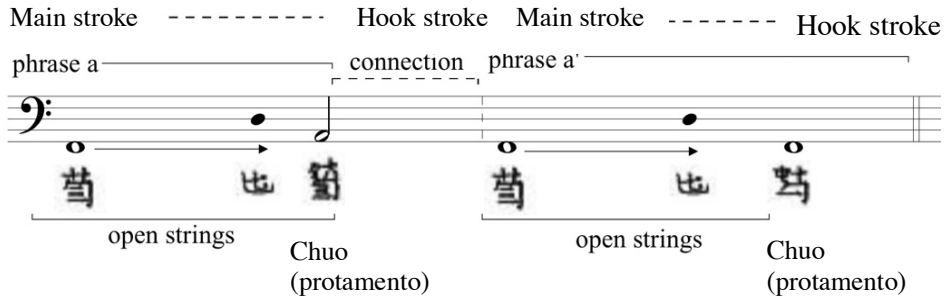
[15] In this technique, the thumb and middle finger of the right hand simultaneously pluck the strings inward, playing an octave or a fifth - quoted from *Glossary of the Art of Guqin* by Cai Liangyu.
[16] Original text:凡欲結構字體，皆須象其衣物，若鳥之形，若蟲食禾… Qouted by Yip in The Art of Guqin Music, p. 120.

In guqin, the musical line is comprised of a series of finger techniques which is similar to the calligraphic line in which different kinds of stroke are always used together to form a line. As Cai Yung refers: In the trace of brushstroke, the left stroke is usually followed by a short right stroke, and vice versa.[17] So, just like calligraphy, it is clear to see that the musical line of guqin is not merely the simple melodic line but the line comprised of the complex and organized movement of finger techniques. This is the important concept that Chou discovers its potential to apply to the connection between the sound with calligraphy.[18] The following Example 1a is the excerpt from the first section of *Three Variation on the Melody Plum Blossom,* and Example 1b is the reduction.

Example 1a



Example 1b – reduction of the musical line in Ex. 1a

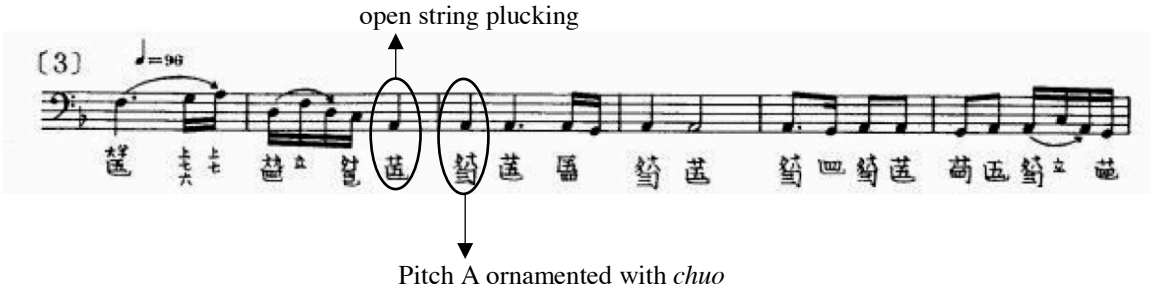


In section 3, the alternation between open string plucking, A, and the *chuo* forms the complimentary relation (See Example 2 below).

[17] Original text: 藏頭，點畫出入之迹，欲左先右，至回左亦爾 Quoted from Cai Yung's article, *Theory of Nine Gestures* 九勢論.

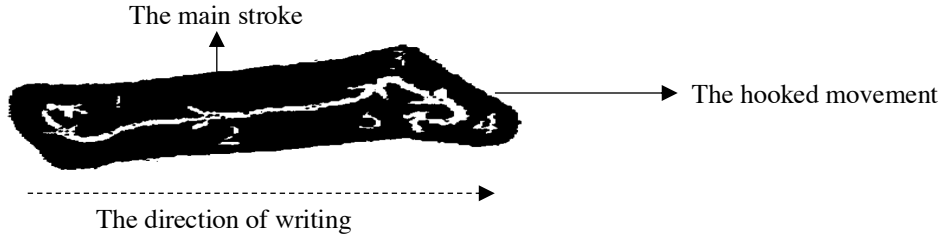
[18]

Example 2



In this movement, the continuous alternation between the open string plucking and *chuo* (slight portamento), is strongly echoed with what Cai Yong mentions, "the left stroke is usually followed by a short right stroke, and vice versa." If we shift the focus to the whole passage of the alternation of open string and *chuo*, then the idea of hooked movement may be clearly heard when the timbral contrasting is formed from the interaction between the open string and the *chuo* technique. The sonorous, stable, and rich quality of open string is analogous to the main stroke of calligraphy; on the other hand, the pliable, subtle quality of *chuo* is akin to the function of hooked movement that is used to wrap the stroke up (See the Figure 2 below). [19]

Figure 2



In the following part, I will focus on the music of Chou to see how he seriously considers the line of calligraphy as the important element that could be transformed and understood as the form of sound.

[19] Wen Xing, *Hiding the Tip – Gateway to Chinese Calligraphy* (Portland, ME: MerwinAsia, 2014), p. 26.

The Gesture of Calligraphy in the Music of Chou, Wen-chung

Chou Wen-chung (1923-) is the first Chinese-born American composer who is keenly aware of the musical quality in Chinese calligraphy. He tries to translate the calligraphic principles to each musical aspect, including pitch organization, counterpoint, rhythmic activity, and timbre. Chou's notable pitch theory, variable mode, is the most important compositional method used to represent the principles in calligraphy. The other musical parameters, such as timbre, rhythm, and dynamic, are also very carefully treated by Chou to incorporate with this pitch theory.

I. Brief Introducing of Chou's Variable Mode

The variable mode is the pitch system that Chou develops based on Chinese *I-Ching* (Change of Book). He creates two different intervallic segments to represent the concept – Yin and Yang from *I-Ching*, and then he uses them to establish an ascending-descending pairing form of modal scale based on the principle of hexagram. The hexagram in *I-Ching* is the fusion of two Trigrams made of different combinations of Yin and Yang. Each hexagram represents different image or natural phenomenon.[20] In the following Figure 1, eight trigrams and their relations are organized by Eric Lai to show their configuration based on the number 1 and 0. The number 1 and 0 are used by Chou to indicate Yang and Yin respectively. [21]

[20] I-Ching. Translated by Rodolf Ritsema and Stephen Karcher. (Rockport, MA: Element Books), 1994.
[21] Eric Lai, The Music of Chou, Wen-chung, p.44.

Figure 1

Symbol	☷	☶	☵	☳	☴	☲	☱	☰
Binary representation	000	001	010	011	100	101	110	111
Name	earth (e)	mountain (m)	rain (r)	wind (w)	thunder (t)	sun (s)	lake (l)	heaven (h)
Alternative name			Water (Wa)			Fire (F)		

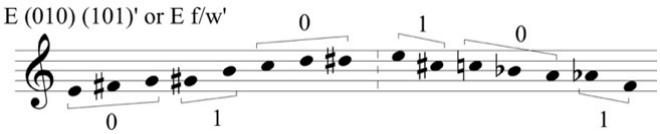
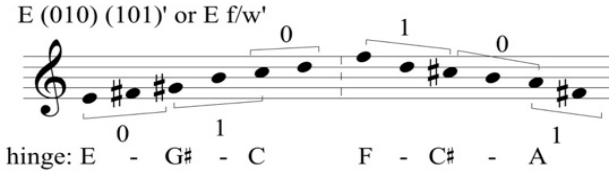
Figure 3.1 The eight trigrams of *Yijing*

a.		b.		c.		d.	
Inversion		Reflexion		Inversion + Reflexion		Identity Operation	
R1		R2		R3		R0	
☷	☶	☷	☳	☷	☱	☷	☷
t	m	t	w	t	l	t	t
100 →	001	100 →	011	100 →	110	100 →	100

As we could see in Figure 1, each trigram is formed by the particular order of Yin and Yang. A variable mode in Chou's music is comprised of two modal scales in ascending form and descending form, each of which represents the different trigram. So, the complete variable mode, which is also called "modal complex",[22] is the representation of the whole hexagram consisted of two different trigrams. Chou's variable mode has gone through different stages of evolution, each of which shows that how Chou modified the intervallic structure to fit the structure of hexagram of *I-Ching*. The evolution of variable mode is shown in the following Figure 1 with their intervallic constructions and structural details in the chronological order.

[22] Kwan, Chun-Ming Kenneth, Compositional Design in Recent Works by Chou Wen-chung (NY: University at Buffalo), 1996, p. 15.

Figure 2

Type I – Yin (M2+m2) / Yang (m3), period: 1960-1969
1. Each segment doesn't overlap 2. The intervallic frame of yin and yang is minor 3rd. 3. The starting pitch of ascending and descending modal scales are identical. 4. Each modal scale can be comprised of 6 – 9 notes. 5. In the following example, the modal complex is based on the hexagram – (010)(101). 
Type II – Yin (M2+M2) / Yang (m3+m2) each segment overlaps, period: 1963 – present
1. Each segment overlaps 2. The intervallic frame of yin and yang is major 3rd. 3. The starting pitch of descending scale is minor 2nd higher than the ascending scale, and vice versa. 4. Each modal scale can only be comprised of 6 notes. Hence, the hexachordal subdivision is possible in any kinds modal complex. 5. In the following example, the modal complex is based on the hexagram - (010)(101). 

In this section, I will focus on how Chou combines his variable mode with the idea of calligraphic principle by analyzing his first work, *Cursive,* that Chou first employed the idea of calligraphy, and *Pien*. Both of these works were based on the Type I of variable mode.

II. The practice of calligraphic technique in Chou's Music

As Chou has already summarized in the letter for Yayoi, [23]the action of calligraphic brushstroke are fully integrated into his musical language. Each musical parameter, including speed, timbre, pitch, and texture, is closely bound with a specific technique of brushstroke.

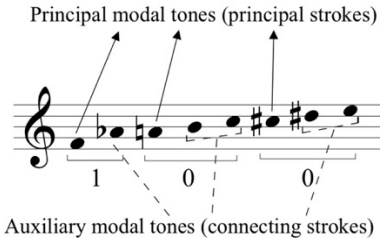
[23] Chou, Wen-chung, Excerpts from a letter to Yayoi Uno Everett regarding Chinese calligraphy, 2006.

According to Chou, there are two primary types of stroke that he uses to connect with variable mode:

1. Principle stroke (主筆) – the principle stroke is the most important stroke of the character. Usually, one character may have one or two principle strokes. Its main function is to support and balance the overall structure of the character.
2. Connecting stroke (帶筆) – the connecting stroke is the auxiliary stroke that connects with principle stroke. [24]

He then indicates that each stroke could be realized as a line of the complete modal scale.

Example 1



As Example 1 has shown, the principal modal tones (F, A, C#) which dominates the primary direction of modal scale, represent the principal stroke in calligraphy, while the pien tones (A*b*, B, C, D#, E), the tones that subdivide the minor 3rd interval to define the yin or yang segments within the principal tones, suggest the idea of connecting stroke. At this point, the series of strokes in the calligraphic work, according to Chou, could be connected with the progression modal scales. He lists several ways as follows to indicate that how the calligrapher manipulates the movement of the brush to create different shapes and linear variety of strokes.

[24] In the conversation between Yayoi and Chou, Chou comments that contrary to daibi, lianbi (connecting stroke) presents a standard technique in which two or more strokes are connected while keeping the brush completely in contact with the paper.

These could all be related to the contour, timbral variation, and dynamic fluctuation in Chou's linear design of a given modal scale. [25]

Figure 3

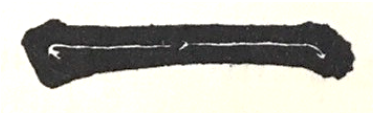
1. Continuing strokes (連續)
2. Transforming strokes (變化)
3. Rise and fall strokes (起伏)
4. Crossing strokes (交錯)

To support us to further examine how Chou draws the calligraphic line in the musical space, I should briefly introduce the basic technique of brushstroke to specify its potentials that could be appreciated and realized in a musical way.

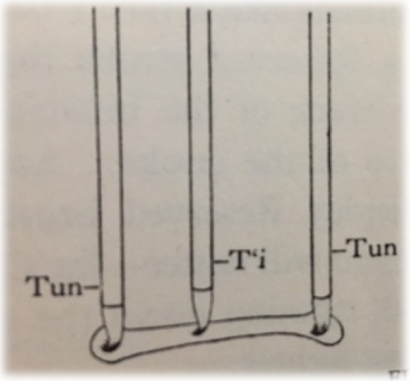
According to Chiang Yee, a single stroke is usually made in accordance with a method called "Method of Three Folds" (三折法).[26] As shown in Figure 4, the horizontal line is basically written from left to right. However, the exact execution of brushstroke is not simply one action. In "Method of Three Folds", before the brush initiates the rightward movement, a slight left turn has to be made to form a small circle at the beginning part of the stroke. After the brush finishes the main rightward stroke, a small left turn, again, is usually used to wrap up the stroke. The integration of two opposing directions in one single line is the basic technique of calligraphy, which can stabilize and firm the primary stroke with the concept of complimentary. We have already seen that how this is represented in the music of guqin.

[25] The Chinese translation of the progression of strokes are directly quoted from Chou's oral history.
[26] Chiang Yee, *Chinese Calligraphy*, p. 147.

Figure 4 – The horizontal Line with "Method of Three Folds" [27]

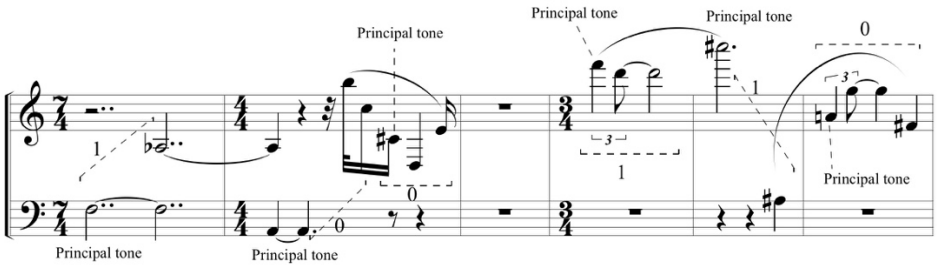


The execution of stroke in "Method of Three Folds"

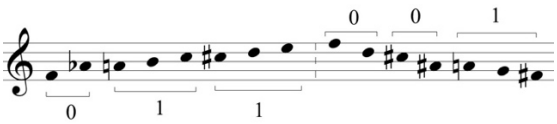


Both in Chou's *Pien* and *Cursive*, such idea could all be found in his linear design of the modal scale. Since Chou very values the movement of brushstroke, each segment from the modal scale is shaped by the principle of contrasting motion in calligraphy. Let's first look at how the basic concept of calligraphy is presented in the modal progression of his *Pien* (See Example 2).

Example 2a – the reduction of mm. 1-6 (In wind part of *Pien*)



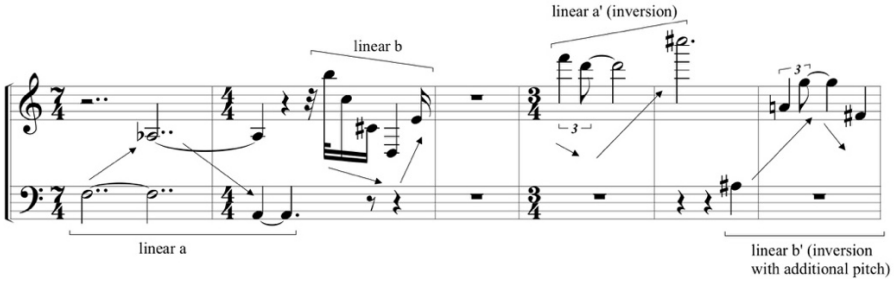
Example 2b – the modal scale used in mm. 1-6



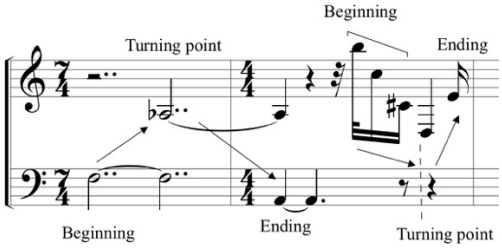
[27] Ibid, p. 147.

In Example 2, each principal modal pitch is assigned with different rhythmic values, registers, dynamic, and timbres, indicating how the quality of principle stroke is varied through traveling on the paper. Moreover, in *Pien* especially, each modal scale is assigned with multiple motivic segments of a specific linear contour. (See Example 3)

Example 3a



Example 3b

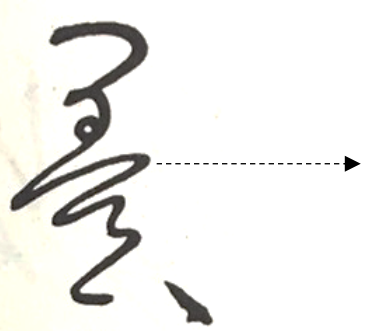


As Example 3 has shown, the yin and yang segment may be included in the motivic segment or may also appear to stay across two motivic segments. So, the motivic segment created by Chou serves as a unique gesture that could be solely developed without the restriction of modal tones. As we could see, the contour of each motivic segment is comprised of three stages similar to that of "*Method of Three Folds*". In Example 3b, in the first stage, it initiates the primary direction that moves either downward or upward until arriving at the second stage the turning point. After the second stage, it moves in the opposite direction and ends the whole motivic segment.

If we take the principal modal pitch, which is analogous to the principal stroke, into consideration, it is interesting to find that not all of them may coincide with one of these three stages: beginning, turning point, ending. But sometimes the principal modal tone is assigned with a short and passing-like rhythmic value, such as the C# in the m. 2 of Example 2, which is almost merged with the auxiliary tones, or pien tones, that surround the principle tone. In this case, I try to take Huai-su's (725-785)[28] cursive work as an analogy to illustrate this relationship between principal stroke and connecting stroke.

His work, *Autobiography* (自敘帖), provides a rich content about not only the historical significance but also his personal artistic achievement on cursive style.[29] Delving into the work itself, it is amazing to see how the character could be varied through Huai-su's refined technique and powerful expression. Some famous comments that were quoted by Huai-su himself in the *Autobiography*, such as coiling dragons, fleeing snakes, and startled vipers,[30] are good analogies to describe some characters that were written in great varieties. In Figure 2, the character "ink" (墨) was simplified as one curve line in which the primary stroke is almost disappeared.

Figure 5 – ink 墨



Usually, the primary stroke plays a decisive role in calligraphy, such as the style Li-shu (隸書) and Kai-shu (楷書). The primary stroke and connecting stroke in these two styles have to

[28] Huai-su, a calligrapher and monk of Tang dynasty (618-907), was known for his wild cursive style.
[29] Adele Schlombs, Huai-su and the Beginnings of Wild Cursive Script in Chinese Calligraphy.
[30] Ibid., p. 53.

be clearly organized and differentiated so as to strengthen the overall structure of the character. Liu, Hsi-Tzai (劉熙載) has considerably discussed the importance of primary stroke in his *Introduction to Art* (藝概). He writes: [31]

> When you draw a mountain, you must first outline the highest peak so that you can make other mountains to lean against on it. When you write a character, you must first find the primary stroke so that other strokes could be organized based on it. If the primary stroke is not perfectly done, then the rest of the strokes might be doomed to failure. Hence, a good calligrapher always makes sure that the primary stroke is well executed.

However, in Cursive style, especially in Huai-Su's work, the structure of the character may be highly varied that appears to be very different from that of Kai-shu and Li-shu. Sometimes the primary stroke and connecting strokes are fused together to form an eruptive and unusual curve. In Chou's *Cursive*, the manifestation of this idea is well represented through the variable mode.

III. One-line calligraphy in *Cursive*

Cursive was completed in 1963. It was composed at the suggestion of Harvey Sollberger and Charles Wuorinen who gave its world premiere at McMillin Theater, New York City. According Eric Lai, this work represents an important milestone in Chou's musical development since it is the first the piece that Chou uses Type I of variable mode to combine with the idea of calligraphy, cursive style especially.[32] In the performance note of *Cursive*, he clearly indicates how he finds the expression of cursive in music:

> Cursive refers to type of script in which the joined strokes and rounded angles result in expressive and contrasting curves and loops. The cursive script represents the essence in the art of Chinese calligraphy as its expressiveness depends solely upon the spontaneous but controlled flow of ink which, through the brush-stroke, projects not only fluid lines in interaction but also density, texture, and poise. These qualities, translated into musical terms, are often found in the music for wind and string instruments of the East. In this score, the cursive concept has influenced the use of specified but indefinite pitches and rhythm, regulated but variable tempo and dynamics, as well as various timbres possible on the two instruments.

---

[31] Original text: 畫山者必有主峰，為諸峰所拱向；作字者必有主筆，為余筆所拱向。主筆有差，則余筆皆敗，故善畫者必爭此一筆 from Liu, Hsi-Tzai, Introduction to Art 藝概, (Taipei: Kuan-Wen Book Stokre, 1969), p.

[32] Eric Lai, The Music of Chou, Wen-chung, p. 61.

With such clear instruction from Chou, we could try to focus on several points in *Cursive* that Chou refers in the program note to see how he transforms the brushstroke of cursive style into music. Before we move to the next part, I want to present the brief introduction of the all arrangement of variable modes in *Cursive* since the representation of calligraphic ideas in this piece is closely bound with the modal progression (See Table 1 below that I summarized).

Table 1

Section		Modal Progression (Type I)	Hidden Progression (Type II)
Part A (mm. 1-25)		Flute: E(single note) – F#(single note) - lt'/G# - B(single note) - tl'/C – D#(single note) - s'w/G#	h'/E (flute part) hinge: **E-G#-C**
		modal centers: **E-G#-C**	
		Piano: t'l/B♭ – m'w/F# - w'm/D – lt'/ B♭ – sw'/D – ws'/F#(sun mode is incomplete)	
		modal centers: **B♭-F#-D**	
Part B (mm. 26-44) / *Faster*		Flute: he'/E♭ – lt'/G – tl'/B	h/E♭ (flute part) hinge: E♭-G-B h/A (piano part) hinge: A-C#-F
		modal centers: **E♭-G-B**	
		Piano: h'e/A – lt'/C# - tl'/F	
		modal centers: **A-C#-F**	
Part C (mm. 45-60)	C-a (*Broad*) mm. 45-48 *the modal progression is crossover between flute and piano	Flute: **m'/F#** - *(lt'/C) – (sw'/E)* – **w/F#** - *(t'l/C)*	
		Piano: *(s'w/B♭)* – **l/C** – *(lt'/B♭) – (tl'/D)* – **t'/C**	
	C-b (*variable tempo*) mm. 49-52	Flute: sw'/G	
		Piano: *C#,B,A#* (without complete modal scales)	
	C-c (*senza tempo*) m.53	Flute: *A#,B,C#,D* (without complete modal scales) – sw'/E♭ – *F#,E♭,D*	
		Piano: s'w/A – *F#*	
	C-b'(*variable tempo*) mm. 54-59	Flute: s'w/E♭	
		Piano: sw'/C# - *F,G,A♭*	
	C-c'(*senza tempo*) m.60	Piano: sw'/A	
Part A (mm. 61-76) / *variable tempo* and *senza tempo*		Flute: *E,F#,G* – sw'/G# - s'w/E – s'w/G# - tl'/A	h'/E (flute part) hinge: **E-G#-C**
		Modal centers: **E-G#-(A)**	
		Piano: s'w/B♭ – s'w/D – sw'/ D – w'm/E♭	
		Modal centers: **B♭-D-(E♭)**	
Part B (mm. 77-95) / *Faster* *the modal progression is crossover between flute and piano		Flute: eh'/B♭ – e/B♭ – G(single note) – *(l't/c)* – G♭ – t'l/D – **C#** - *(l'/g)* – **C#** - *(t/g)*	
		Modal centers: **B♭-G♭-D-(C#)**	
		Piano: h'e/E – D♭ - C – (l't/g♭) - t'l/A♭ – e/E – (m/c#) - **G** – (w'/c#) - **G**	
		Modal centers: **E-C-A♭-(G)**	
Coda (mm. 96-103)		Flute: wm'/E – E ; Piano: t'l/B♭ – (E~B♭)	

In cursive style, because of its fast speed of writing, some lines in one character might be joined with others to form a larger one single curve line. This idea is referred as the technique, one-line calligraphy. Schlombs has defined the concept of one-line calligraphy *Huai-Su and the Beginning of Wild Cursive Script in Chinese Calligraphy* as follows: "Frequently, sequences of characters or whole columns are written with a single line. With an almost trance-like sureness the characters are fused into a single rhythmical movement or 'gesture' that evolves in a complex pattern of eruptive curves and playful waves." Taking one of examples from Huai-Su's *Autobiography*, the one-line calligraphy could be found in the following Figure 6. [33]

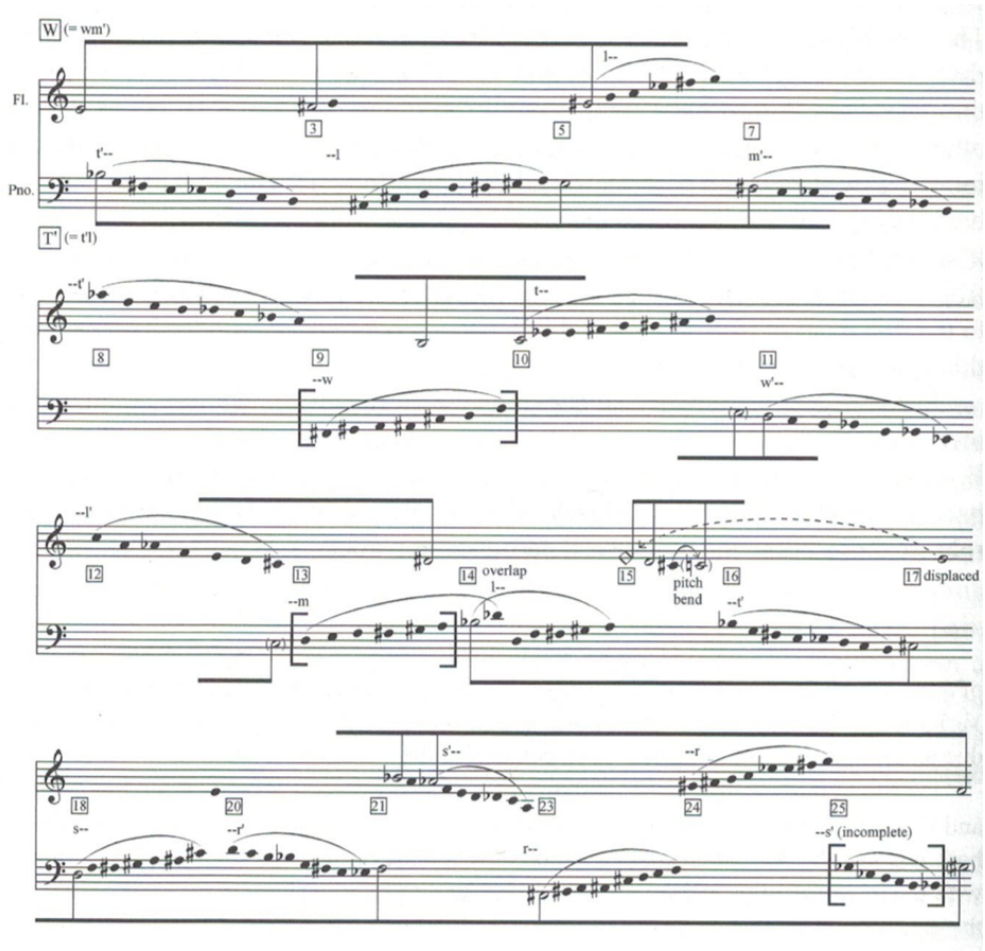
Figure 6

In Figure 6, there are five characters in the column. However, through the technique of one-line calligraphy, Hua-Su is able to use only four curve lines to cover all characters. Each character are simplified to merge with the primary line. In Chou's *Cursive*, this idea is represented by merging multiple modal scales together to form a larger modal progression. In the beginning, the modal scale is unfolding in a straightforward way. Each modal line is presented in the flute part and piano part respectively. However, according to Eric Lai, there are some extra notes in the flute part that are not part of the local modal scales, which imply the larger

[33] Adele Schlombs, Huai-Su and the Beginnings of Wild Cursive Script in Chinese Calligraphy, p. 195.

progression of the modal scale. The following Example 4 shows Lai's reduction of the score at mm. 1-25.

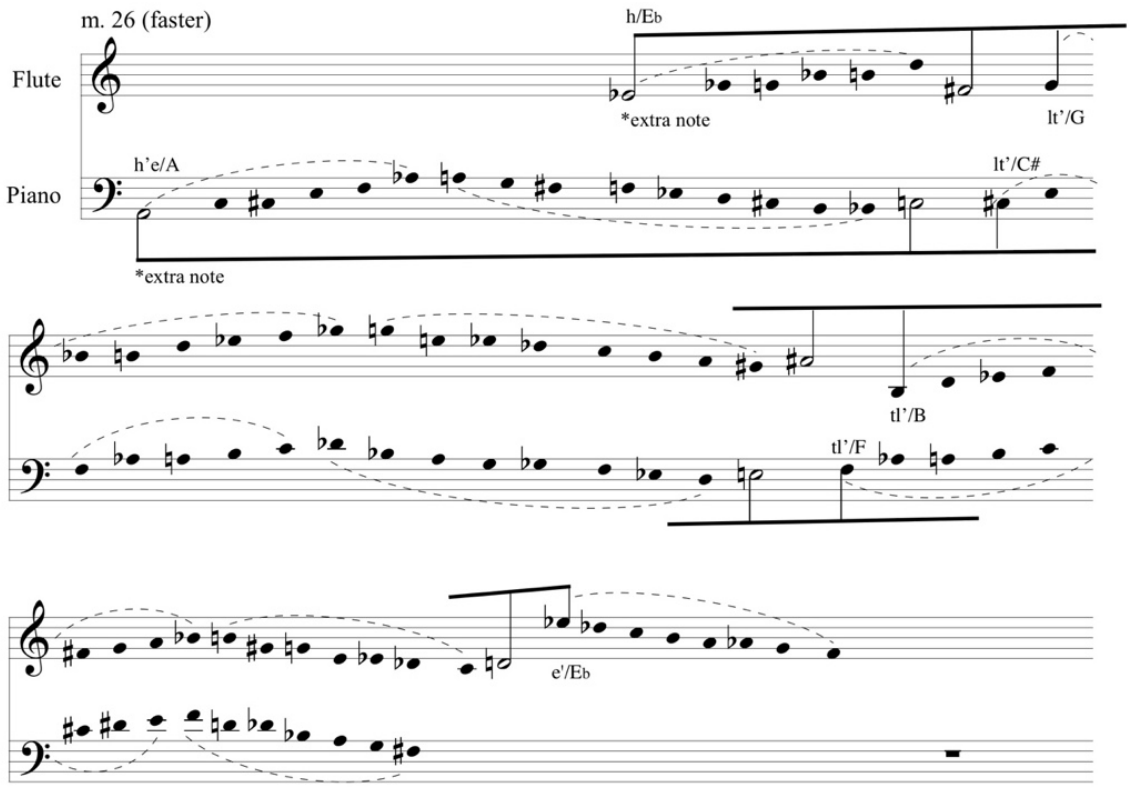
Example 4



In Example 4, the white head notes in the flute part and piano part indicate the extra notes. If we connect all these extra notes, we could found a larger modal scale (011) in the flute part and (100) in the piano part. In my opinion, this passage suggests that how Chou uses this larger modal progression to indicate one-line calligraphy. The extra notes are used for guiding those smaller modal scales (the solid note-head in the above Example). So, we could imagine that the smaller modal scales are those smaller lines in the character, whereas the extra notes serve as the dominating force that leads the overall movement of the modal progression. At mm

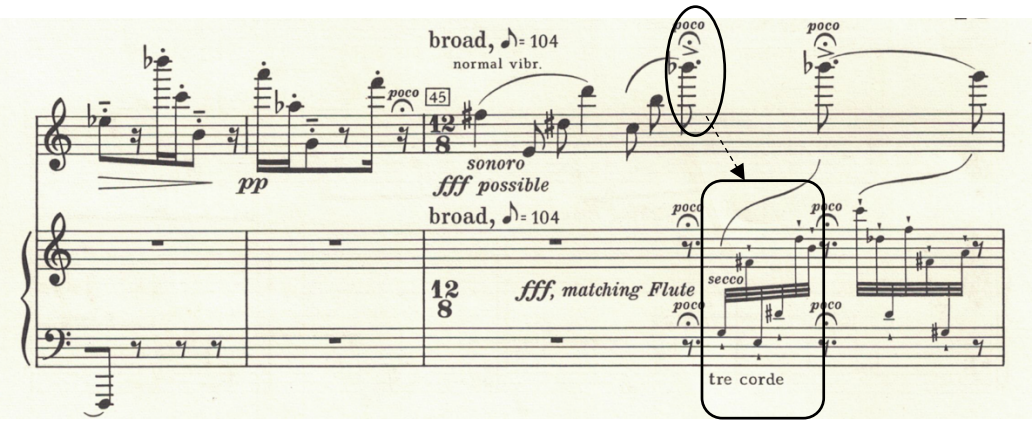
26-36, there are also several extra notes leading the other smaller modal scales to form a larger progression (See Example 5)

Example 5



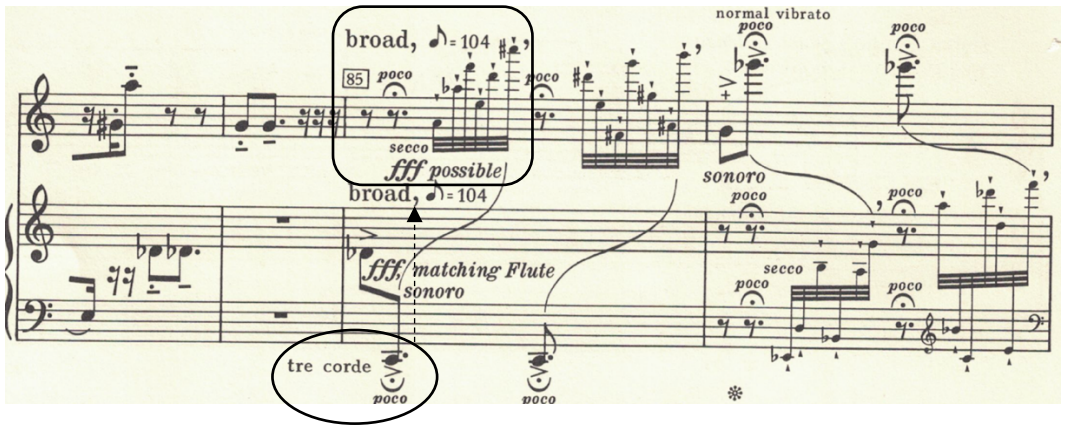
Beginning from the part C, the idea of one-line calligraphy is represented in a more straightforward way. At m. 45 (See Example 6 below), the flute part serves as a guiding melodic line, whereas the piano part closely follows the larger notes of the flute part and extends them to form a smaller modal progression. Just like one-line calligraphy, there is one primary line that always dominates other smaller lines in the characters. In this example, the B-flat of flute part serves as this primary line, which is the central force that dominates the derived modal scales of the piano part. The piano part, on the other hand, is analogous to the detail of the character.

Example 6



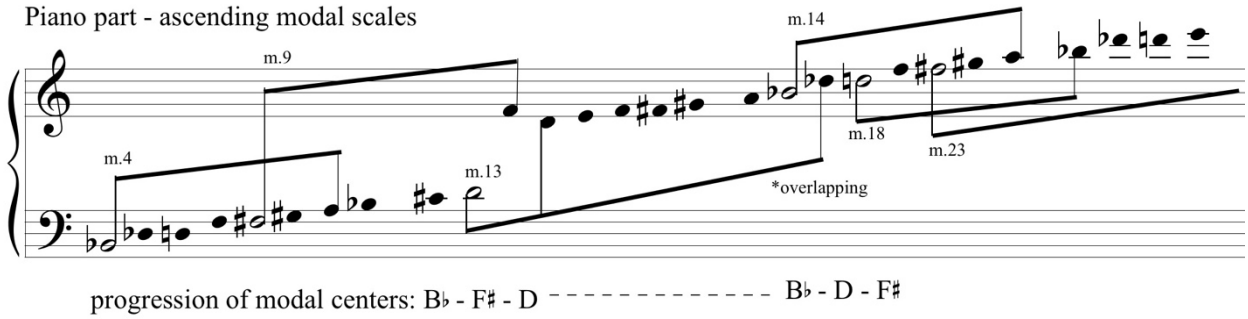
Interestingly, the relationship of interconnected modal scales between piano and flute is reverse at mm. 85-95. The piano part now plays the larger notes (See Example 7).

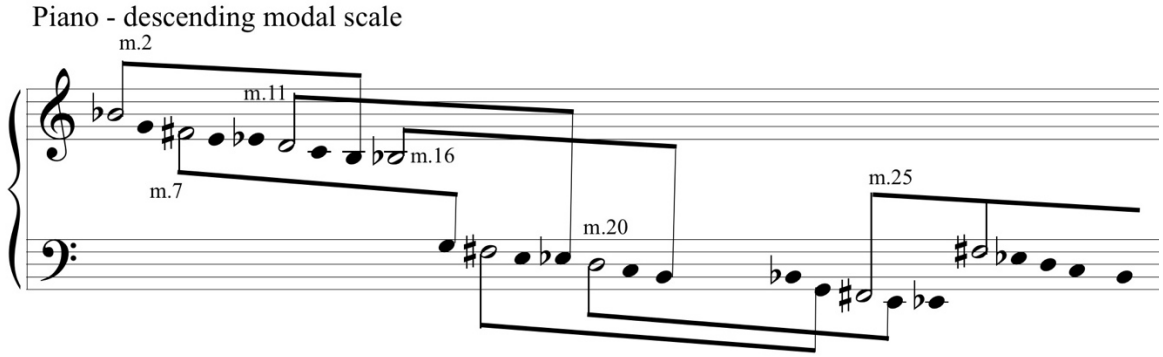
Example 7



Furthermore, if we delve into the detail of the local modal progression, we could observe that each modal scale shares several common tones with the following one. In this way, Chou is able to bridge the modal scales and create a sense of coherency in the large musical line. With this idea, this progression of modal scale might unveil the idea of the gradual evolution of one-line calligraphy. In the following Example 8, I extracted the ascending modal scales and descending modal scales respectively to see how each modal scale is interlocked with another one to form a seamless and continuous flow of line.

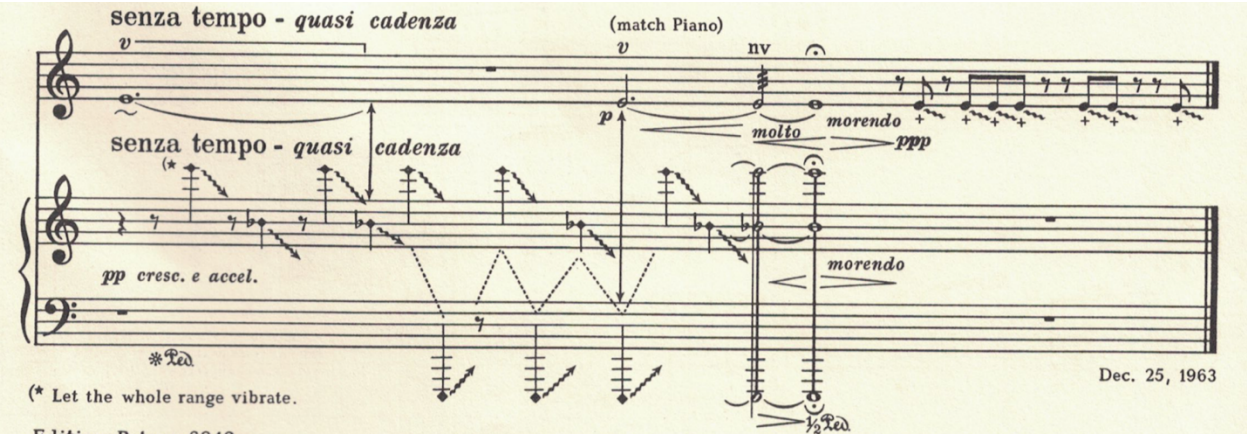
Example 8





Finally, another outstanding and distinguished example of one-line calligraphy could also be found in the end of the piece (mm. 102-103). Chou uses the extended technique, rubbing the strings in the piano with finger, to present the total chromatic sonority, which suggests the freedom from the modal scale. Interestingly, the control of the starting notes, E and Bb, again highlight the most important intervallic structure in *Cursive*. It also resonates with the idea that even though the one-line calligraphy is the technique to show how calligraphers could vary the character through their expression, the structure of the character is still a important framework that calligrapher needs to carefully consider before he executes the technique of one-line calligraphy.

Example 9



Throughout Chou's compositional output, we could still see that how he uses many different ways to represent the calligraphic principle. His next work, *Pien*, may suggest more connections between music and calligraphic principle. In *Pien*, the variable mode is not only one mean to represent the ideas of primary stroke and connecting stroke, but we can also find more musical materials, including timbres, rhythm, motivic gesture, and register, that are used by Chou to support his sonic brushstroke. Through listening, one can perceive the movement of brushstroke in his sonic world.

Pien, composed in 1966, is the study of "transformation" and "change" in *I-Ching*. Pien, literally means "change" in Chinese, is the most basic concept of *I-Ching*. According to Chou, he writes of the concept of pien in *I-Ching*: "on one level, simplicity from which complexity is evolved; on another level, phenomena out of complexity; on still another level, conglomeration and dispersion of phenomena; and finally invariability."[34] This work employs six variable modes to indicate six hexagrams of *I-Ching*, each of which is translated into the specific organization of duration, intensity, articulation, timbre and contour. [35] With this idea, Chou is able to create a sonic painting based on those materials that are closely integrated with calligraphic principle.

[34] Chou, Wen-chung, preface of Pien.
[35] Ibid.

The line itself is not just formed by one-dimensional object, but the organization of multi-dimensional materials. This idea also reflects the essential beauty of Chinese calligraphy. As Chou refers in his article:[36]

> Line, mass, and their interaction, together with such elements as articulation, duration, intensity, and timbre, are organized into an integrated body of sound that ebbs and flows – in the manner of a tonal brushwork in space – with ever-changing motion, tension, texture, and sonority.

In this part, I want to further discuss how Chou transforms the technique of brushstroke into his music through the organization of timbre, intensity, and rhythm, which might seem more complicated than that of *Cursive*. Also, I will try to elaborate Chou's idea, *tianbai*, to reveal his unique compositional method that no one could be paralleled with.

VI. The Progression of Brushstroke in *Pien*

Although the list of stroke progressions (see Figure 3) that Chou provides to claim its relation to his music seems really allusive, it actually yields more possibilities for us to imagine how the calligraphic principle is correlated with music. For example, the transforming stroke, in Chinese calligraphy, suggests the change of direction, thickness or the variation of ink flow in the principle stroke, which might correspond to the nature of continuous change of timbre in one instrumental sound.

Taking Chou's list as a reference, I observe that a single motivic segment in *Pien* is always changed in terms of timbre, orchestration, rhythm, and dynamic, which is analogous to the variation of the stroke or character in a calligraphic work. However, throughout this continuous transformation, we can still identify its basic shape. So, I realize that Chou can gesticulate the motivic segment through the expression of calligraphic techniques. The following Example 10 shows one of the motivic segments at mm. 16-20.

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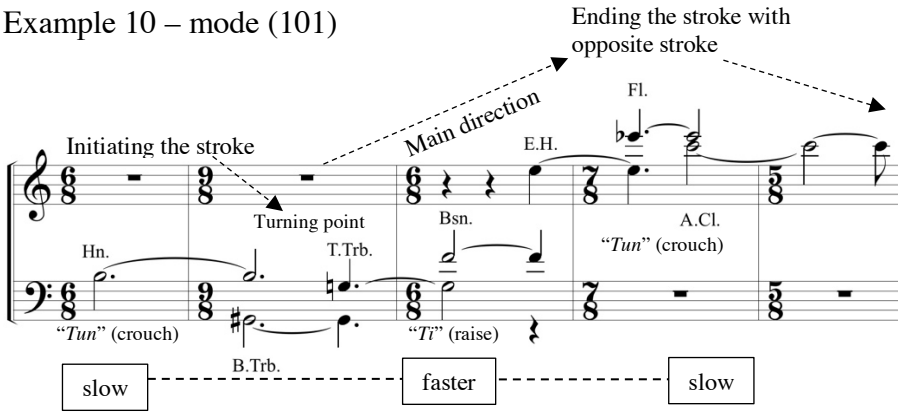
[36] Chou, Wen-chung, "Towards a Re-Merger in Music" in Elliot Schwartz and Barney Childs, eds, Contemporary Composers on Contemporary Music, 1978.

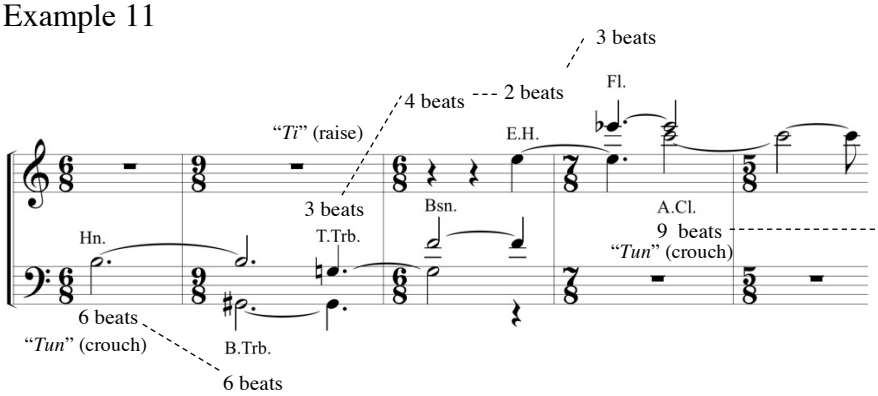
Example 10 – mode (101)



As I analyze in Example 10, several calligraphic aspects could be more clearly discerned, such as "*The Method of Three Folds*" and the different speeds of executing this stroke. In regard to the rhythm Chou divides this motivic segment into five rhythmic sections: 6/8 – 9/8 – 6/8 – 7/8 – 5/8, each of which provides different rhythmic pulses to depict the subtle adjustment of the "*Method of Three Folds*". As I mentioned above, the technique of "*Tun*" (crouch) is the gesture of circular movement for the preparation for the main line of the stroke. "*Tun*" may also need longer time to write because it has to be carefully executed so as to strengthen the foundation of the starting point. "*Ti*" (raise), on the other hand, is quicker than "*Tun*" since it is generally going directly to one direction. When the stroke is about to end, "*Tun*" is used again to carefully and slowly wrap up the stroke.

In my observation, the speed change in this process is also transformed by Chou into the musical rhythm of Example 10. The first point, "*Tun*" is comprised of two long modal pitches, B and G#, whereas other shorter modal pitches, G – F – E – E*b*, form the movement of "Ti". Finally, E*b* (overlapping with the previous movement) and C may again suggest "*Tun*" with long rhythmic values. The following Example 11 provides the number of rhythmic pulses in each point.

Example 11



Number of rhythmic pulses in *Tun* and *Ti*:

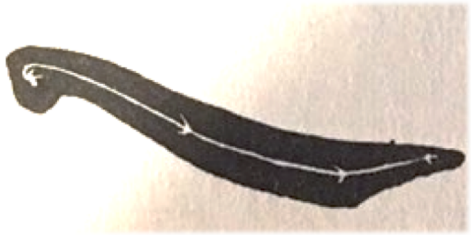
1. Starting point: "*Tun*" 6 + 6 (B-G#)

2. Main line: "*Ti*" 3 + 4 + 2 (G-F-E-E*b*)

3. Ending point: "*Tun*" 3 + 9 (E*b*-C)

If we can take the shape of motivic segment into consideration, the overall design is similar to *Na* stroke (Sweeping Rightward Stroke). As Figure 7 has shown,[37] the lower part of *Na* stroke is used by a steady and heavy "*Tun*" which may take longer time to write than the starting point. In Example 11, we could see that both starting point and ending point are comprised of twelve beats, but at the ending point, two notes are assigned with unequal beats where the longer C (comprised of nine beats) is analogous to the ending point of *Na*.

Figure 7 - *Na*



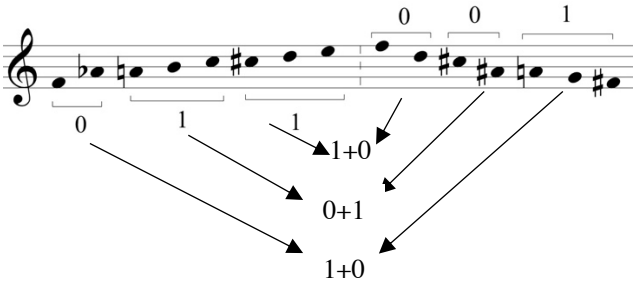
[37] Chiang Yee, Chinese Calligraphy, p. 158.

V. Tian-bai (filling in) Technique and Its Evolution in Chou's Variable Mode

When we approach the idea of calligraphy in Chou's music, we can't always use only one point of view to examine. Although Chou has provided the guidelines of exact correspondences established between calligraphic gestures and musical element, the expression of musical work itself can still evoke different imagination.

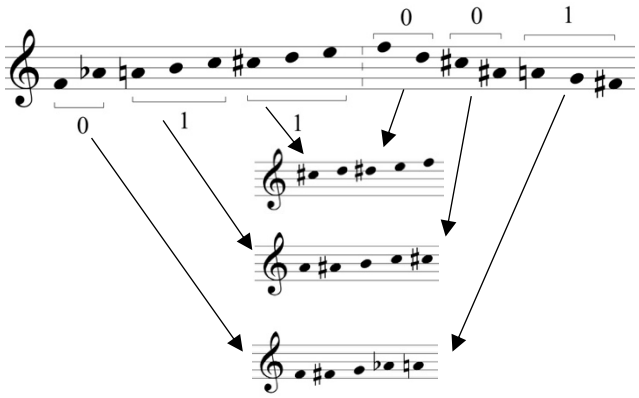
However, *Tianbai* (filling in) is a specific technique that Chou employs to clearly associate with the particular element in his yin/yang polarities of variable mode. According to Eric Lai and Yayoi Uno Everett's conversations with Chou, this term is derived from the concept of *liubai* (blank-leaving) in calligraphy and painting which means that the space is left empty on purpose without ink or strokes as part of the overall structural design. The term, *tianbai*, is coined by Chou to create the opposite process of filling in the space of *liubai* by using the idea of yin/yang segments. In variable mode, the choice of yin and yang segments is based on the complementation and opposition between descending and ascending modes. (See Example 12)

Example 12a



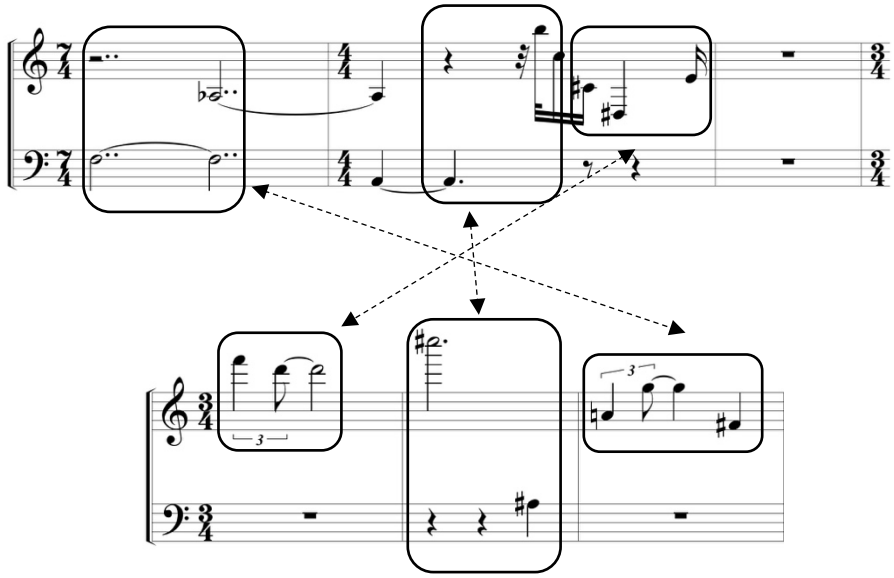
As I mention earlier, each yin/yang segment in the ascending mode is paired with the opposite one in the descending mode. With this opposite pairing, a complete modal complex is able to produce all twelve tones. (See Example 12b)

Example 12b



By presenting the complete modal complex, the process of *tianbai* has occurred when the spaces of the intervals in the first ascending or descending mode are filled in by their opposite yin/yang segments to form a total chromatic aggregation. At this point, the yin/yang segments in the individual ascending or descending mode may suggest the shape of the empty part, while the next modal scale is to articulate this space by presenting the complementary segments. So, the concept of *tianbai* in Chou's music is represented through the complementation of yin/yang segments.

Example 13



The manifestation of this mutual complementation between descending and ascending modes is almost presented in each pairing modal scales in *Pien*. Although the concept of *tianbai* is relatively abstract in the sense of pitch structure, I think this concept is possible to clearly and specifically illustrate through introducing the calligraphic works and ink paintings. When I saw the paintings by Ma-Yuan (1190-1125), such as "*Viewing Plum Blossoms by Moonlight*", its complementation comprised of natural objects and empty space immediately makes me think of Chou's concept of *tianbai*. Also, the structure of the Chinese character that I learned from Chiang's *Chinese Calligraphy* is highly related to the complementary segments in Variable Mode. So, to further bridge the connection between Chou's *tiabai* technique and the actual visual art, there are three points that I observed and learned from Chou's writing about how this concept could be observed in the real painting, and how Chou applied it to his music.

First, in some of the Chinese characters, I found several rules about how to organize the size and shape of smaller parts in order to yield the other part to fill in.[38] In this idea, the process of "filling in the space" is presented in a sense of the perfect coordination within each component of the character. Second, in the ink painting, the empty space and the natural objects mutually interact. At this point, the concept of *tianbai* actually reveals how the spatial materials are merged together by interpenetration to form a unified whole. To discuss this point, I will introduce Ma-Yuan's painting, *Viewing Plum Blossom by Moonlight*, which is also referred by Chou in the article, *Music Composition and Chinese Culture*.[39] Third, as Yayoi points out, Chou also equates the invisible movement between strokes to the "filler" notes, or nonchordal notes that connect the structural pitches with the underlying mode or modal complex. The filler notes,

[38] Chiang Yee, Chinese Calligraphy, p. 180.
[39] Confluence: Collected Essays of Chou Wen-chung. Lei Liang, editor. Luo Qin, associate editor (Shanghai: Shanghai Conservatory of Music Press, 2013), p. 230.

at this point, becomes the vital part that filling in the space between structural pitches, suggesting the idea of *tianbai*. So, according to Lai's conversation with Chou, the way how Chou represented the concept of *tianbai* in his early work is not exactly the same as his later works. Obviously, the idea of complementation and *tianbai* technique in the system of variable mode has significantly transformed based on how Chou interprets the art of calligraphy and ink painting differently. In this paper, I will only discuss the *tianbai* technique applied in his early and middle works.

The first type of *tianbai* idea could be found in the basic structure of Chinese character. When a character is comprised of two units, one of which has to be smaller so as to yield the other unit to fill in. Sometimes, the larger part may be extended to provide a wide space to let the smaller units fill in. All of these rules could be found in Li Shun's "*Eighty Four Laws for the Structure of Characters*".[40] The following figure shows some of these rules:

Figure 8 – Mutual Concession (相讓)

Figure 9 – In Filling Up, Leave No Empty Space (滿不要虛)

Figure 10 – Embracing and Wrapping Up (回抱)

As we could see, the larger unit that creates the empty space is frequently filled in by the smaller and dense strokes so that the overall structure of the character could be maintained in a

[40] Some rules have been partially translated in Chiang Yee's *Chinese Calligraphy*.

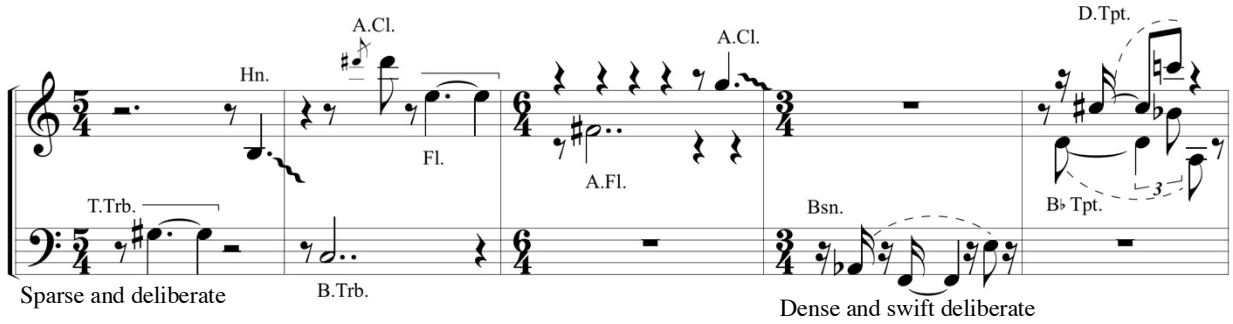
state of equilibrium. At this point, the texture is the important key to see how Chou manages the progression of the modal scales.

In *Pien*, almost each pairing modes are also comprised of two opposite musical textures or different orchestration, which reflects Chou's understanding of the contrasting characteristics in calligraphy, especially the features in Cursive style. The following two items are summarized by Chou in his letter for Yayoi:

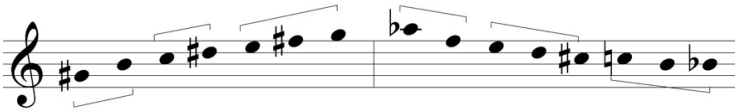
1. Sparse/dense (疏密)
2. Deliberate/swift deliberate (遲速)
3. Delicate/stressed (輕重)
4. Straight/slanted (直曲)
5. Thick/attenuated (濃淡)
6. Face-to-face/back-to-back (向背)
7. Feint/solid (虛實)
8. Rise/fall (起伏)
9. Vertical/horizontal (縱橫)

Among these items, sparse/dense, straight/slanted, face-to-face/back-to-back, feint/solid, rise/fall, and vertical/horizontal could be seen as the structural aspect in the construction of Chinese character, while other items, such as deliberate/swift deliberate, delicate/stressed, thick/attenuated, might be referred as the quality and energy of the brushstroke. Though each of them could be analyzed and viewed in a musical way, I will select several items to discuss with the concept of *tianbai* and draw some excerpts from *Pien* to examine their relationships.

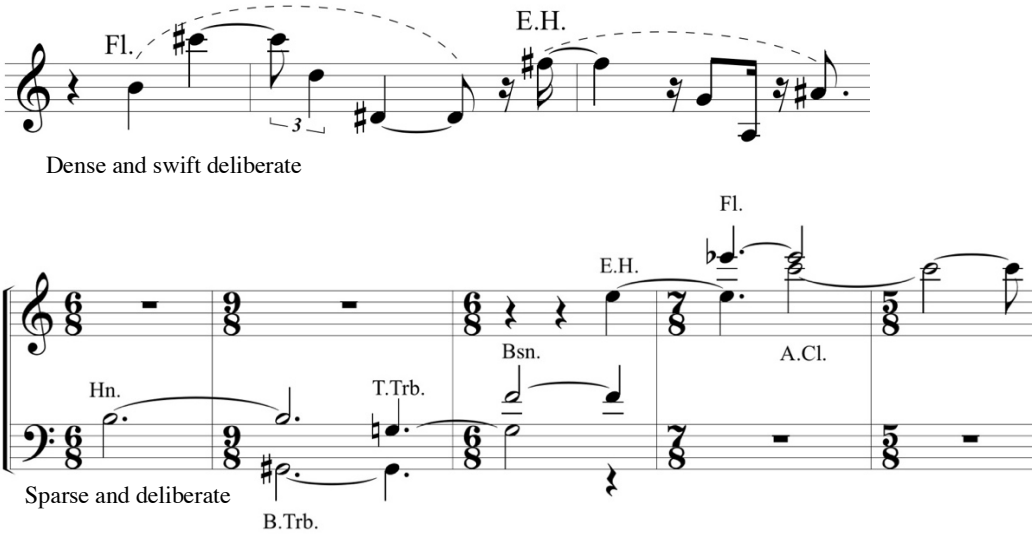
Example 14a mm. 8-12



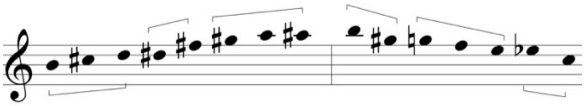
The Complementation of the Pitch Structure (110/100):



Example 14b mm. 13-20



The Complementation of the Pitch Structure (010/101):

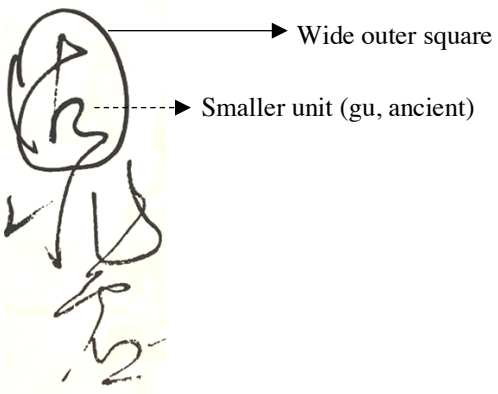


In Example 14, the two pairing modes are assigned with a specific texture respectively, forming the contrasting characteristic between ascending and descending modes. As Example 14a has shown, the first ascending mode (110) is presented with a sparse and deliberate texture[41] in which each note is carefully crafted and articulated by the predetermined techniques, such as inflections and very dry staccato, that Chou designed.[42] The quality of sparseness in this ascending mode is also caused by its loose rhythmic connection and the use of multiple instruments which may seem to invite something to fill in. When it precedes to the descending mode (100), its dense quality, resulted from the great concentration on the single instrument

[41] The terms applied to describe the textures are directly quoted from Chou's letter to Yayoi.
[42] Chou, Wen-chung, preface of *Pien*.

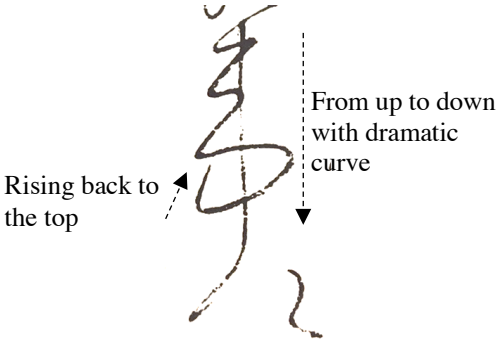
color and the rigid and swift rhythmic activity, immediately fill in the space left by the previous texture. Psychologically, Chou creates a sonic environment that enables us to expect or predict that something contrast may come after the first ascending or descending mode. This is also the important method that Chou tries to transform the spatial and structural tension in the calligraphic work to the sonic world. At this point, I could draw the example from Huai-Su's cursive work, *Autography*, as analogy. (See Figure 11)

Figure 11 – Character, Gu (固)



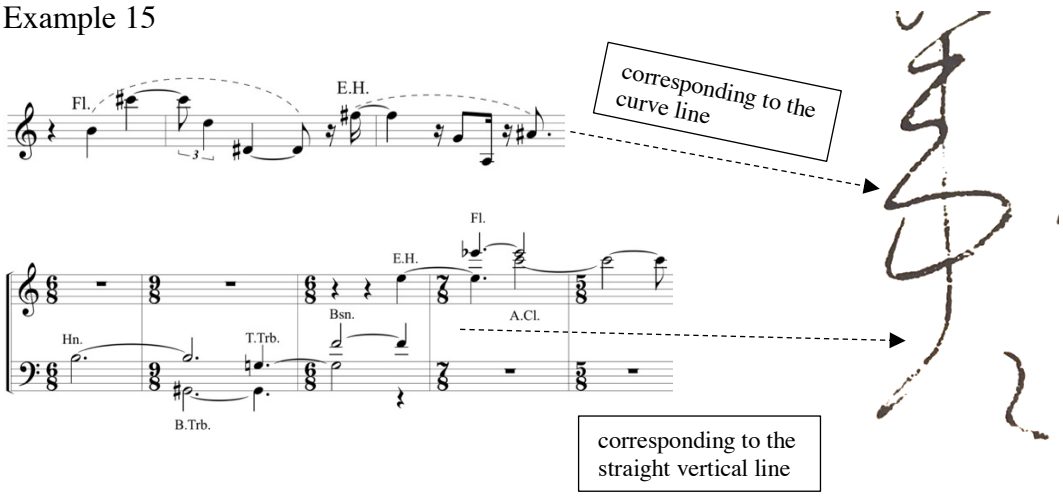
In Figure 11, the character Gu, means "therefore", is written with a large and wide outer square in which the smaller unit, *gu* (with different tonal inflection in Chinese), means "ancient", is filled. In Huai-Su's calligraphy, we could see that the outer square might be created by a slow and deliberate brushstroke, whereas the filling-in part is written with a quick and precise brush movement. This structural contrast seems to echo with the Example 14a where the first mode provides a large space and the second mode fills this space with strong and rigid sonic gesture. The other similar example from *Autobiography* is shown as follows.

Figure 12 韋公



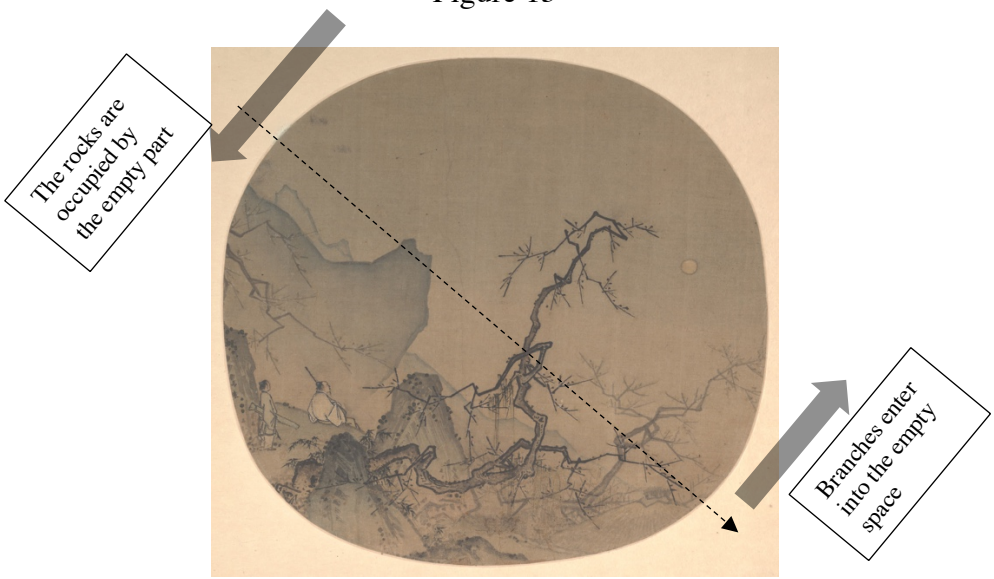
In the above Figure 12, "*Wei Gong*" (Ministry Personnel Wei), is the person, Wei Chih, who encouraged Huai-Su to pursue the perfection of calligraphy. These two characters are also formed by the technique of one-line calligraphy. The line is first written from up to down with dramatic curve and immediately rises back to the top without the trace of ink, then the brush drops vertically with almost pale and dry ink to the next character, *Gong*, and slightly and quietly finish the character. When I see these characters, I could feel that the empty space around the vertical straight line is filled in by the vivid and coiled curve line. The whole movement of this brushstroke resonates with Chou's music very strongly. This curve line is like the dense and swift deliberate modal scale at mm.13-15 (See Example 14b above), while the straight vertical line is analogous to that excerpt at mm. 16-20. Such example could be found almost in every modal pairing of *Pien*. I compare the calligraphy of Figure 12 with the musical example at mm. 13-20 as follows.

Example 15



Secondly, the concept of *tianbai* could also be found in Chinese ink painting. The following Figure 13 is the painting, *Viewing Plum Blossom by Moonlight*, by Ma-Yuan.

Figure 13



As Chou analyzed in his article, this painting could be viewed by dividing it as two parts (as the slanted dotted line indicates in Figure 13). The first part, the lower left, is comprised of mountains, rocks, trees, and a man with a boy carrying the Chinese guqin, while the second part, the upper right, is mostly comprised of the sky, which is the empty part, and moon. When we carefully view this painting, the empty part and natural objects are actually not deadly separated

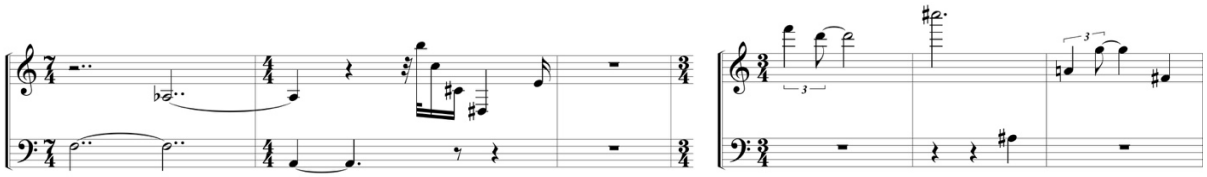
but vividly interacted and mutually embraced with each other. As Chou points out, the extended crooked branches directly enter to the space of sky, while the upper rocks covered by the mist and haze seem to be gradually occupied by the empty part. Although this painting is appearing to be still, its structural configuration generates a vivid interaction based on the continuous transformation between the sky and the natural objects. The connection between the man and moon are smartly connected by the tree, which alludes the harmonious relationship between human and nature.[43] As we could see this perfect complementation between natural objects and empty space, the concept of *tianbai* could be found when the painter tried to fill in the space with the extended crooked branches. The upper rocks, which seems to be occupied by the empty part, may also be recognized as the process of being filled by the sky, or more precisely, being merged with the sky. With this observation, these two parts are established at the point that everything is balanced with each other. A removal of any part might destroy the equilibrium of structure.

In Chou's works, although the concept of *tianbai* has been only elaborated through the complementation of yin/yang segments, the spacing of the modal tones can also reveal the process of *tianbai* similar to the technique of spatial arrangement in the ink painting. In *Pien*, each pitch in a modal scale is assigned to the fixed register. Through the presentation of the complete pairing mode, Chou employs the whole musical space to accommodate all twelve tones. Interestingly, the recurring principal modal tones in both ascending and descending modes are not fixed at the same space but changed when the first mode proceeds to the next one. Since the modal scales in *Pien* are almost presented in a linear way, I try to rearrange each of pairing mode in the vertical way to show how these two complementary modes interact with each other. (See Example 16 below)

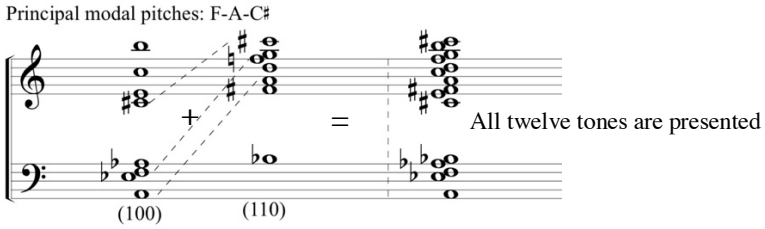
[43] Chou also refers the man and moon as the incarnation of Chinese Tai-Ji in *Confluence*, p, 230.

Example 16 – mm. 1-6

Original version (100/110)



The spacing of modal pitches of the pairing mode in vertical:

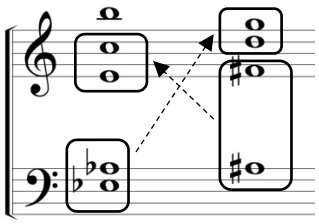


If we look at the vertical space, it is clear that the second modal scale fills in the musical space left by the first modal scale. Also, the construction of two modal scales reveals an important concept, the symmetrical structure, where several dyads are expanded from one single axis note. At this point, the second modal scale is actually the inversion of the first one. In the following Example 17, I show the relationship between these two modes by first removing the principal modal pitches. [44]

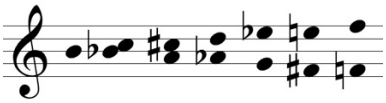
[44] The principal modal pitches in Chou's Variable Modes are separated by the interval major 3rd, which is equal to the augmented triad. So, by inversing this principal modal pitches, we actually get the same pitches. For example, the principal modal pitches at the mm. 1-6 are F, A, C#. The inversion of these three notes are the same. For the sake of clarity, it is easier for us to identify other inversion forms by just temporarily removing the principal modal pitches.

Example 17

Two pitch collections without principal modal pitches



The symmetrical structure that applied to the construction of this pairing modes:

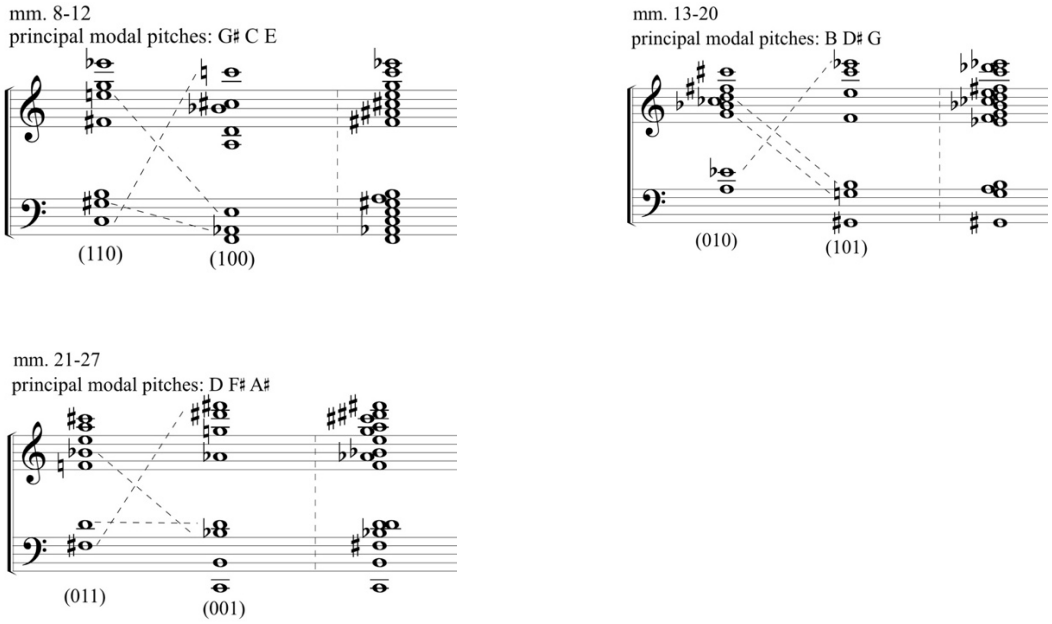


As Example 17 has shown, both E*b*/A*b* and E/C correspond to G/D and A#/F# respectively. Only the high B in the first modal scale is left, which forms an incomplete symmetry.[45] However, we could see that the B is the axis of this symmetrical structure, so its missing in the second vertical group seems reasonable since the B itself is the axis of the overall symmetrical structure. Chou might think that it is redundant to repeat the B again in the next group.

By showing the spacing of modal pitches, we have a clear idea to see how the technique of *tianbai* could allow Chou to create various shapes of sound mass by integrating two opposing sonic materials, which is like how Ma-Yuan organize the sky and natural objects. The following examples show the other musical spacing from mm. 7-27.

[45] Such asymmetry in this example is referred as the concept of "water-image symmetry" by Pan, Shyh-Ji in "*Symmetry as a cultural determinant in the music of Chou, Wen-chung*".

Example 18



The Idea of Sonic Brush in the Music of Lei Liang

Following Chou's path, as what I have known, Lei Liang is the composer who still consistently and persistently cultivates the idea of employing calligraphic art as the important part of his compositions. It is worth mentioning that Liang is not merely the successor of Chou, but also the explorer who finds the new musical dimension to express the art of Chinese calligraphy and ink-painting.

As I mentioned above, Chou use his variable mode to systematically incorporate with the techniques of brushstroke in his works. His unique technique, tianbai, based on the complementation of two modal scales is inspired by the spatial relationships between objects and empty part in the real painting. So, in Chou's music, the representation of calligraphic idea could almost be observed through this particular system of variable mode. On the other hand, Liang endeavors to explore the potentials of the single sound to try to create different sonic expressions to evoke our imagination about Chinese ink painting and calligraphy, including the progression of brushstroke, the shade of ink, and even the body gesture of the calligrapher. At this point,

mere pitch analysis is not enough for us to understand his music. Rather, we have to observe the transience of the sound that how it flows in the sonic space and to feel the immediate moment when it is transformed, collided, or passed away. With this idea, we can touch the essential beauty in the combination of calligraphy and music that Liang aims to express. In this part, I want to focus on his chamber orchestra, *Brush-Stroke*, to discuss how the idea of calligraphy and ink-painting is transformed by Liang's sonic brush.

I. One-note polyphony

Brush-Stroke was composed in 2004. It was commissioned by Stephen Drury and the Callithumpian Consort who gave its world premiere at the New England Conservatory of Music's Enchanted Circle Concert Series in 2005.[46] As Yayoi notes, this piece is especially inspired by the calligraphic style – slender gold invented by emperor Hui-Zong of Song (1082-1135) and the wild cursive style of Monk Huai-Su (ca. 735-799). [47] Both calligraphic styles are extremely different but gesturally beautiful that there is no way we can compare. As we could see, the title of the piece is separated by a slash to indicate two different ideas – "brush" and "stroke", which respectively represent two calligraphic styles – slender gold and wild cursive. The overall piece is also subdivided into two parts in accordance with the title.

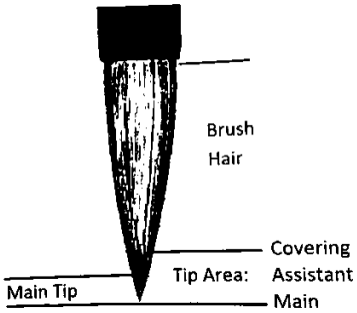
One-note polyphony is the central idea that Liang uses to represent the essential beauty of calligraphic art. As Liang himself noted, this idea is inspired by the music of guqin in which one single note could be executed by many different finger techniques to create various timbres. So, as we discuss above, the flow of melody in guqin music is not only comprised of a series of notes but also a wide variety of timbres and finger gestures, which is similar to the execution of the line in calligraphy. With this inspiration, Liang is interested in creating and resynthesizing the timbres based on the single note by using different instruments and techniques to explore how

[46] Lei Liang, the preface of *Brush-stroke*.
[47] Yayoi, Uno Everett, Liner Notes to *Brushstroke* by Lei Liang, New York: Mode Records (2009).

we could differentiate the changes and transformations of the timbres.[48] As we mention, in tradition, the execution of the line in calligraphy is not merely one action, but is based on the careful control of "Methods of Three Folds". Huang, Bin-Hong, one of Chinese ink-painters whom Liang really admires, also points out: "One can observe that in the single brushstroke by those masters, the Three Folds could be found in the one brush, different layers and colors could be found in the one stroke".[49]

According to Liang, the idea of one-note polyphony could also be regarded as a calligraphy brush and its brush-hairs. Through the manipulation of the brush, calligrapher has to learn to control the pressure of the brush-hairs upon the paper so as to master in different techniques of brushstroke. The brush-hairs is the key to create a rich variety of the shape of the stroke and the shade of ink, which allows us to trace the feature of multi-direction within one stroke on the paper. The following Figure 1 shows the body of the brush hairs. [50]

Figure 1



Taking it as the analogy, the brush itself is like the concept of "one-note", which serves as the platform where various timbres are presented and interwoven, while its brush-hairs which

[48] Lei Liang, "Some Vital Experiences and an Artistic Statement," People's Music, Vol. 585, 2012.
[49] This quotation is translated by myself. It is also quoted by Ban, Li-Xia, a musicologist who has done great research on Liang's music, to describe its relation to the idea of one-note polyphony in The Compositional Technique and Artistic Characteristic in Sonic Brush of Lei Liang.
[50] Wen Xing, Hiding The Tip – Gateway to Chinese Calligraphy, p. 12.

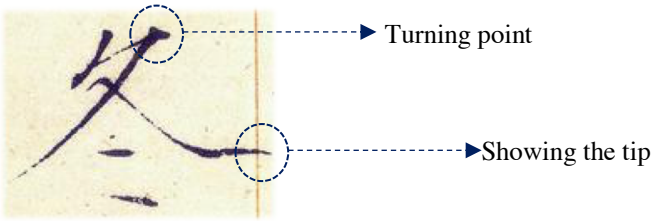
is responsible for creating the subtlety of the shapes and colors corresponds to the idea of "polyphony" presented on that platform of "one note."[51] Unlike Chou, Liang is not only focusing on transforming the structure of calligraphy and painting into his music, but the inspiration from the brush and brush-hairs also lead him to create the concept of sonic-brush in his music.

So, this technique is the important mean for Liang to bridge the art of calligraphy and his sonic world. In the next part, I will analyze the first section, *Brush*, in terms of the technique, one-note polyphony, and to examine how Liang uses it to represent Hui-Zong's calligraphic style – slender gold.

II. The First Part of *Brush-Stroke* – The Style of Slender Gold

Hui-Zong's calligraphic style, slender gold, is characterized by its extremely thin but sturdy stroke. The name, slender gold, comes from the fact that this type of writing is similar to the gold filament which could be twisted. In this style, the tip of the brush and the movement "*Tun*" (crouch) are directly exposed at the starting point and the turning point of the stroke, which is not what traditional calligraphers usually did as they usually try to hide the tip of brush to make the stroke richer and more stable. The following Figure 1 shows the example of slender gold from Hui-Zong's "*Thousand-Character Essay*" done when he was only twenty-three years old.[52]

Figure 1

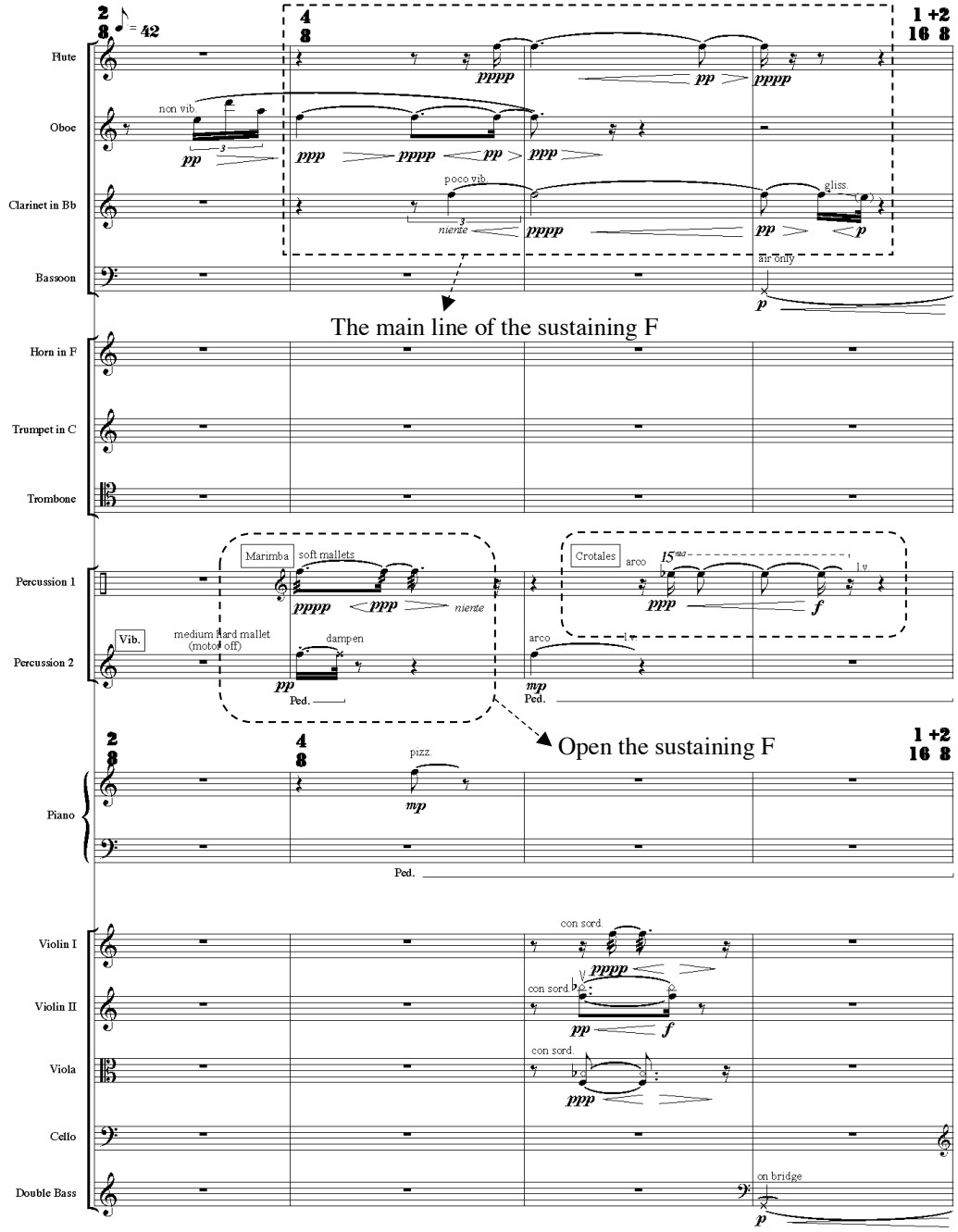


[51] Conversation with Liang
[52] Chinese Calligraphy, translated and edited by Wang Youfen (New Heaven: Yale University Press, 2008)

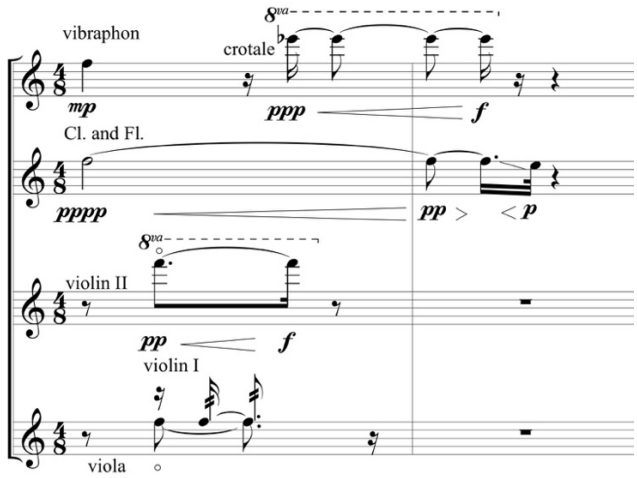
As Figure 1 has shown, the character, *Dong* (winter), is comprised of the extreme thin strokes. The turning point at the upper right part of the character is clearly shown. Also, we can see the trace of the tip of brush at the ending point of the "*Na*" stroke at the lower right part (indicated by the dashed circle). Furthermore, the line in the middle point of the stroke, such as "*Na*", is almost disappeared because the "*Ti*" (Raise) movement might be over executed, so the ink is also not able to fully penetrate the paper and appears pale. However, it doesn't influence the sturdiness of this style because the structure of the character is strengthened by the emphasis on the turning points. These are some salient features of the slender gold style. We can find so many beautiful details in one stroke if we carefully examine Hui-Zong's execution of brushstroke.

In *Brush-Stroke*, Liang is able to fully integrate this idea into the technique of one-note polyphony. One-note polyphony could be discerned in almost every detail of the piece. In the first part, it is especially obvious since the speed is very slow so that we could easily perceive each moment when the timbre is changed or transformed. At mm. 2-4, the note, F, has gone through several stages of timbral evolution (See the following Example 1a). At m.2, the F is performed by the oboe, marimba, and vibraphone at the same register. As we could see, the tremolo of marimba and the short stroke of vibraphone may be served to support and enhance the attack of starting point of the sustaining F line. At the middle point, m. 3, the oboe part is gradually took over by the clarinet and flute with extremely soft dynamics. And this is the moment that Liang starts layering the F with the same note but different timbres and registers by using the string parts (See the reduction of Example 1b). Interestingly, the extremely high E*b* of crotale, produced by bowing technique, is like the sudden inflection or the deviation of the F. Acoustically speaking, the E*b* may still sound like part of the F because it is the 7th partial of the f_6 harmonic series. Following with the bright color of the crotale, the calligraphic line, sustaining F, is finally finished with the short glissando-gesture of the clarinet.

Example 1a


Flute
Oboe
Clarinet in Bb
Bassoon
Horn in F
Trumpet in C
Trombone
Percussion 1
Percussion 2
Piano
Violin I
Violin II
Viola
Cello
Double Bass
non vib.
poco vib.
gliss.
air only
The main line of the sustaining F
Marimba
soft mallets
Crotales
arco
Vib.
medium hard mallet (motor off)
dampen
Open the sustaining F
pizz.
con sord.
on bridge

Example 1b – layering at m. 3



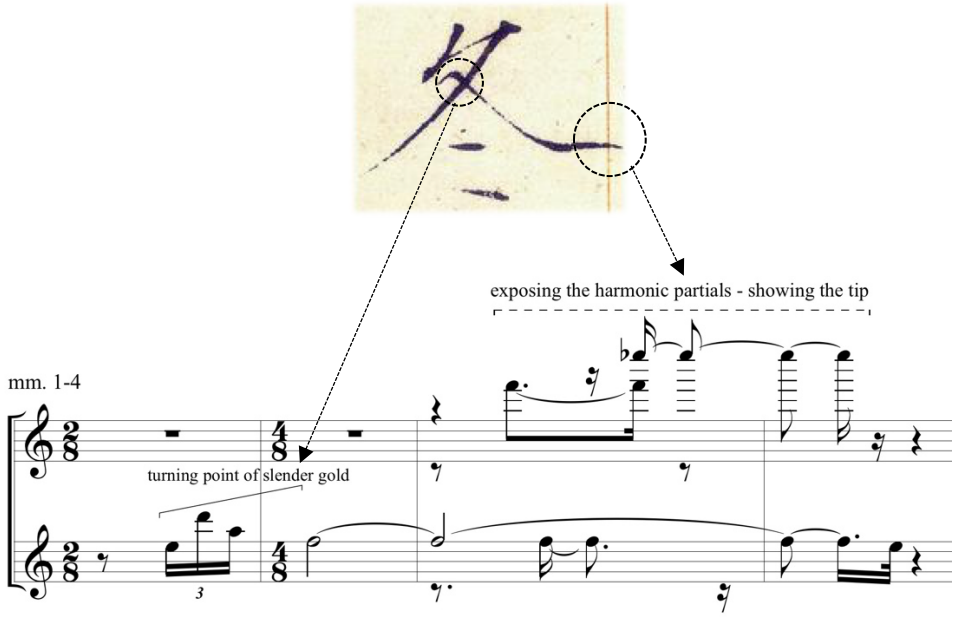
The activity of timbral variation on the single F is so rich that it contains timbral layering, punctuating, and pitch deviation (microtonal inflection). Although Liang always tries to avoid the direct imitation of the real calligraphic work,[53] he is able to capture the abstract beauty of the slender gold style by using this extraordinary technique. Let's see through how the slender gold style could be analyzed and understood in this first phrase.

Because the flow of pitch in the first phrase is almost stationary, the melodic figure of the oboe at the m. 1 is relatively sonically noticeable. Plus the soft attack of vibraphone and the tremolo of marimba, these first two measures are relatively more animated than the rest part of the phrase. At this point, it seems to me that this could be analogous to the turning point, which is intentionally emphasized by Hui-Zong, in the character of the slender gold style. When we approach the end of the phrase, the E*b* of crotale highlights the 7th partial of the f6. Naturally, we can't hear this specific harmonic partial because it is too high and soft for human's ear unless we use other extended techniques to trigger this specific harmonic partial or shift the fundamental to the very low register. Hence, the harmonic series of the given note is always hidden to be part of

[53] Ban, Lixia. The Compositional Technique and Artistic Characteristic in Sonic Brush of Lei Liang, Chinese Music, Vol. 3, 2016.

the fundamental, and the individual partials are usually not perceived separately but are merged together by our ear into a specific quality of timbre. So, the bright and loud E*b* played by bowing on the crotale is extremely unusual as if Liang intentionally tries to expose this harmonic partial to let it be heard separately from the harmonic spectrum of f6. In my opinion, this idea greatly resembles the exposure of the tip of the brushstroke in slender gold style. So, this might be the reason why Liang introduces violin's artificial harmonics as the preparation for the high E*b* of crotale as well. The following Example 2 shows the comparison between the character in slender gold style by Hui-Zong and the score reduction of mm. 1-4.

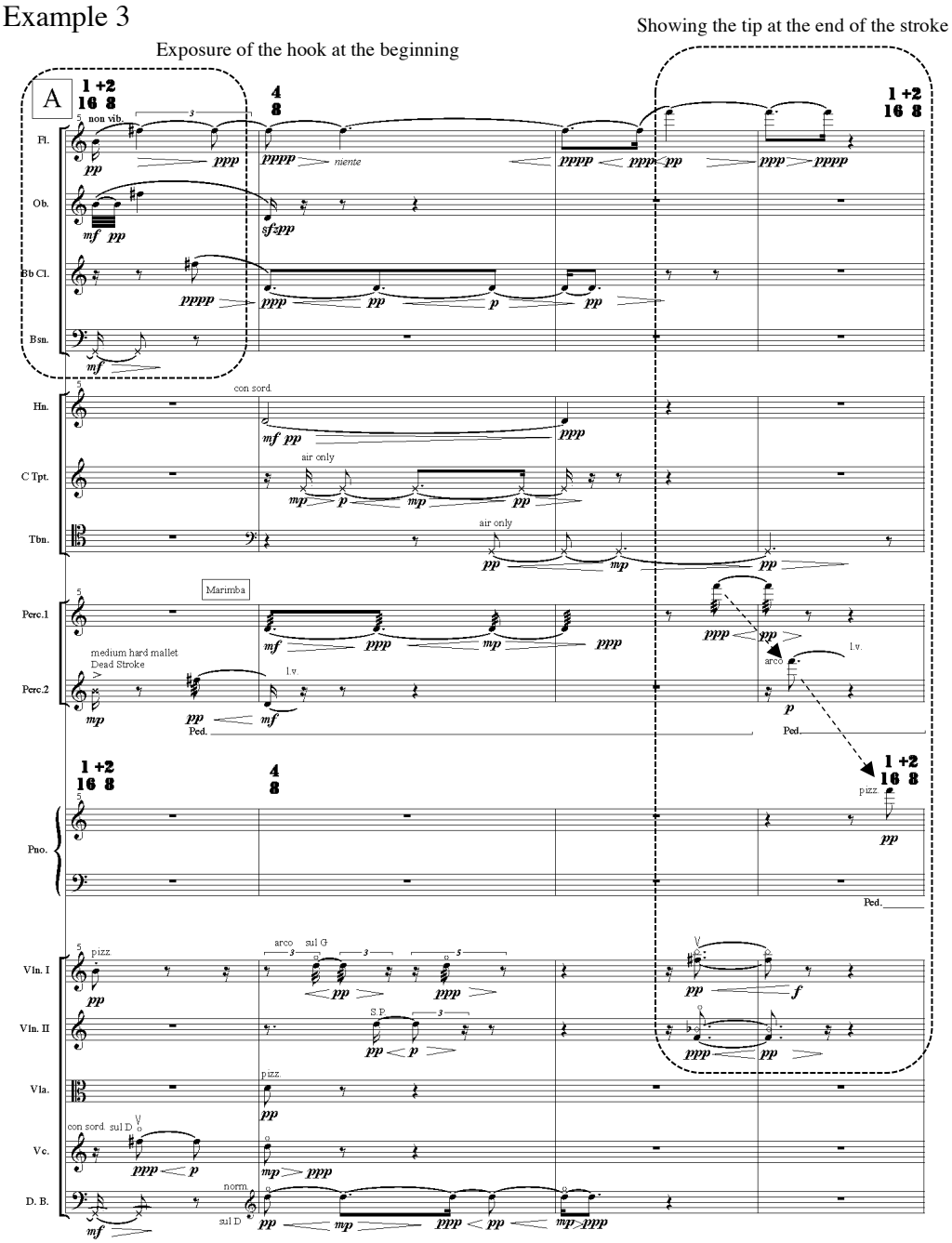
Example 2 – reduction of mm. 1-4.



After the first phrase, Liang doesn't always allow himself to repeat the same timbral configuration. He pushes himself to develop more varieties of timbral variation in each new phrase. At this point, it creates the process of growing complexity in the development of one-

note polyphony. For example, we can see that the timbral evolution in the next phrase at mm. 5-8 is more complex than the first phrase (See Example 3 below).

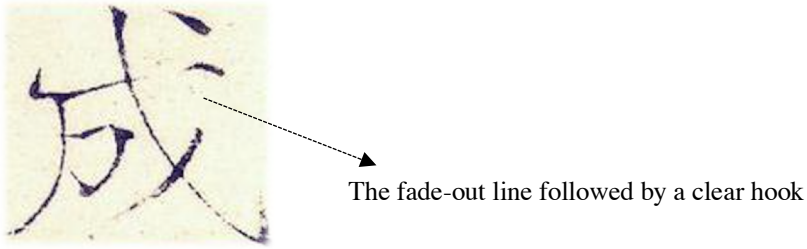
Example 3



In Example 3, the ending of the phrase is comprised of five beautiful timbral layers in which the exposure of the harmonic partials is still vividly articulated. When the main line of the flute, which is played from the beginning to the end, arrive at the F, the artificial harmonics, F

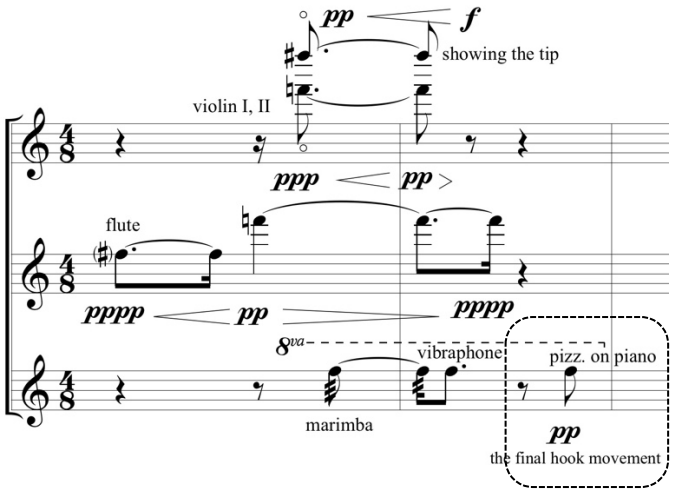
and F# in two different registers, played by two violins are used to, again, represent the exposure of the tip as well. At this time, marimba and vibraphone provide the attacks to punctuate the pulses of the line. Interestingly, after the F line is almost finished, the pizz., executed by plucking the string in the piano, in the piano part, gives the final attack to indicate the subtle continuation of the F. If we consider this passage as the progression of brushstroke, the pizz. of piano is very unusual since it is played after the representation of the exposed tip and, frequently, this tip should be placed at the end of the stroke. However, in the *Thousand Words Essay*, we can still find a similar example to see how it occurs in the calligraphic work.

Figure 2



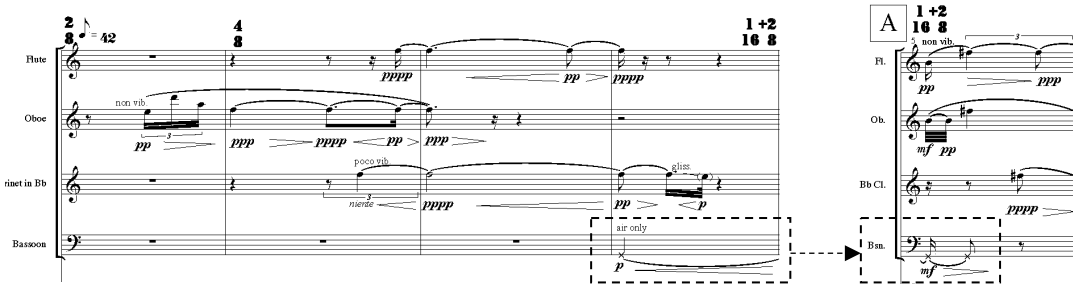
As we mentioned above, in slender gold style, the main line of the stroke might be very thin and even disappear because the calligrapher sometimes over raises the brush. At this point, the tip of the brush might be easily exposed at the middle of the main stroke. In the long stroke, the tip is seen when the calligrapher raises the brush. Then it temporarily disappears because the brush is totally lost the contact with the paper while the calligrapher is still moving the brush in the air until he arrives at the end of the stroke and finishes it with a clear and strong hook movement (Please see Figure 2). A well-trained viewer is able to imagine this process in his mind and won't perceive this stroke as two separate parts. And Liang successfully transforms this detail into his music. In the following Example 4, it shows the reduction of mm. 7-8.

Example 4 – reduction



Another creative way to represent this progression of brushstroke could be found in Liang's use of noise, or non-pitched sound. In my observation, the noise also plays a significant role in this piece. At mm. 4-5, the air noises played by bassoon and double bass seem to serve as the connection between the first phrase and the next phrase (See Example 5).

Example 5 – air noise of bassoon



The use of airy noise in this piece seems like how Hosokawa bridges the silence and sounded world. However, Liang develops his own unique way to treat the noise as the extension of his technique of one-note polyphony. As we could see, the dynamic of noise is very clearly notated. It might be thought of as the transition from the end of the first phrase to the beginning of the next one. Even though the noise is not able to function as pitch which one could identify its highness or lowness, the growing dynamic in this particular sound draws my attention, and I

can always feel that the noise and the phrases are dynamically connected. At this point, if the pitched area is analogous to the visible stroke, this air noise might be considered as the invisible connection between the strokes. Like the concept of tianbai in Chou's music, the noise might be the material that Liang employs to delineate the empty space between visible objects. This approach seems very different from that of Chou, but the careful control of dynamic and the meticulous choice of the color of noise in Liang's music may suggest that he is clearly aware of its strong potentials in establishing the connection between calligraphy and sound.

In addition, he also tries to layer the pitch materials with noise. This kind of mixture in *Brush-Stroke* might be like some characters that are written by the parched brush and split open hairs. This dramatic effect, in cursive style especially, is referred as "flying-white" (飛白).[54] The quality of the line written with "flying white" technique might appear dry and withered. The following Figure 3 shows the specific example from "*Thousand Words Essay*".

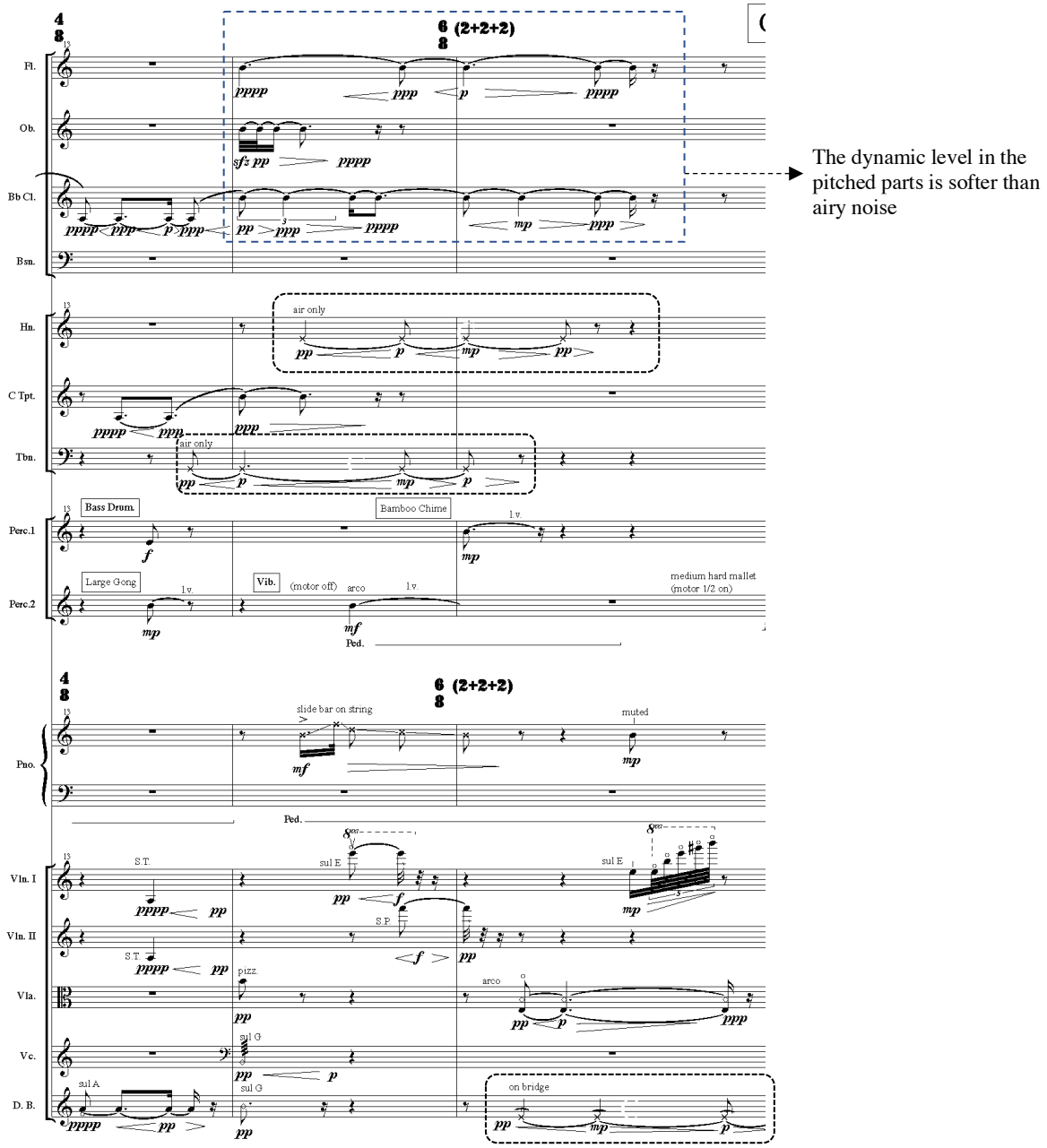
Figure 3

In Figure 3, the ink quality of the two "*Ke Hook* strokes" (戈鉤),[55] especially the line with downward inclination, in the right part of the character appears as though it is still floating without being fully depositing upon the paper. It presents a very unique beauty that the stroke is

[54] Adele Schlombs, Huai-Su and the Beginnings of Wild Cursive Script in Chinese Calligraphy, p. 69.
[55] In *Chinese Calligraphy*, Chiang Yee elaborates this stroke as follows: The "Ke" is an acient Chinese fighting weapon something like a javelin and shaped like the form in this figure. It is written first slightly upwards, then with a downward inclination to the right, and ends in an upward hook.

dry, yet sturdy, aerial, yet steady. In *Brush-Stroke,* there are some parts where the noise and pitched materials are presented simultaneously (See Example 6). In Example 6, the airy noises produced by horn, trombone, and double bass might somehow blur the primary pitch B played by the wind parts. Liang also intentionally reduces the dynamic level of the pitched parts to make them softer than that of airy noise. It seems to me that the airy noise might temporarily dominate the flow of the sound but still closely attach with the pitched sound that is about to recede to the silence. In this passage, Liang's new exploration on one-note polyphony allows him to further enter into the new area beyond the pitch domain. Thus, the one note serves as the structural element, but what makes this technique so unique are those materials, such as noises and harmonic partials, emitting from the starting note and interweaving together in a strict organized way as polyphonic texture. So, just like the brush, it serves as an important tool for the calligrapher to begin to write. Yet, what gives the life to the character is actually the brush-hairs that enables the calligrapher to meticulously articulate the details of the stroke.

Example 6



The one-note polyphony also reveals an important aspect of calligraphy – Rhythm. In some calligraphic styles, such as *Kai-Shu*, calligrapher has to carefully control the speed of the brush movement so as to allow the ink to have enough time to penetrate the paper. On the other hand, the cursive styles may require calligrapher to execute the brush in a very fast speed. In this way, the ink is not able to fully deposit on the paper and creates a very dramatic effect that enhances the intensity of the emotion. Thus, like musician, a good calligrapher must need to

know how to control the speed of the brush in accordance with his own body, mind, and breathing. In *Brush-Stroke*, this idea has been successfully accomplished in the two separate sections with two distinctive tempos that each of them represents a style of calligraphy - slender gold and wild cursive. However, the musical tempo is not Liang's only one way to present the rhythm of calligraphy. In one-note polyphony, the rate of changing timbres also reveals a sense of rhythm, which is more irregular and unpredictable, yet spontaneous. And it also allows us to observe the clear trajectory about how the rhythmic activity of the first section is evolved into the beginning of the second section.

Huang, Bin-Hong once discussed five methods of brushstroke as follows – 1. Smooth (*Ping*, 平) 2. Rounded (*Yuan*, 圓) 3. Remain (*Liu*, 留) 4. Heavy (Zhong, 重) 5. Change (Pien, 變),[56] each of which is a technique of brushstroke and how to execute it with different speeds and gestures. In "Remain" especially, he writes:

> The stroke is always moving forward with the slight motion of turning back so that the starting point and the ending part are tightly connected and supported with each other. With calmness and attentiveness, the speed of the stroke may not be too rush or too slow[57]

In this sentence, "not too rush and not too slow" clearly indicates that the calligrapher should carefully control the speed of brush without being too fast or slow so that the stroke might appear as natural as "water stains on a wall".[58] Thus, it doesn't mean to be slow or fast, but must be very flexible depends on the flow of ink. With this idea, the rate of changing timbres in one single note successfully represents this subtle and flexible flow of rhythm in the stroke, *Remain*. At mm. 1-4 (See Example 1a), the change of timbres is very subtle. The F line starting from m.2

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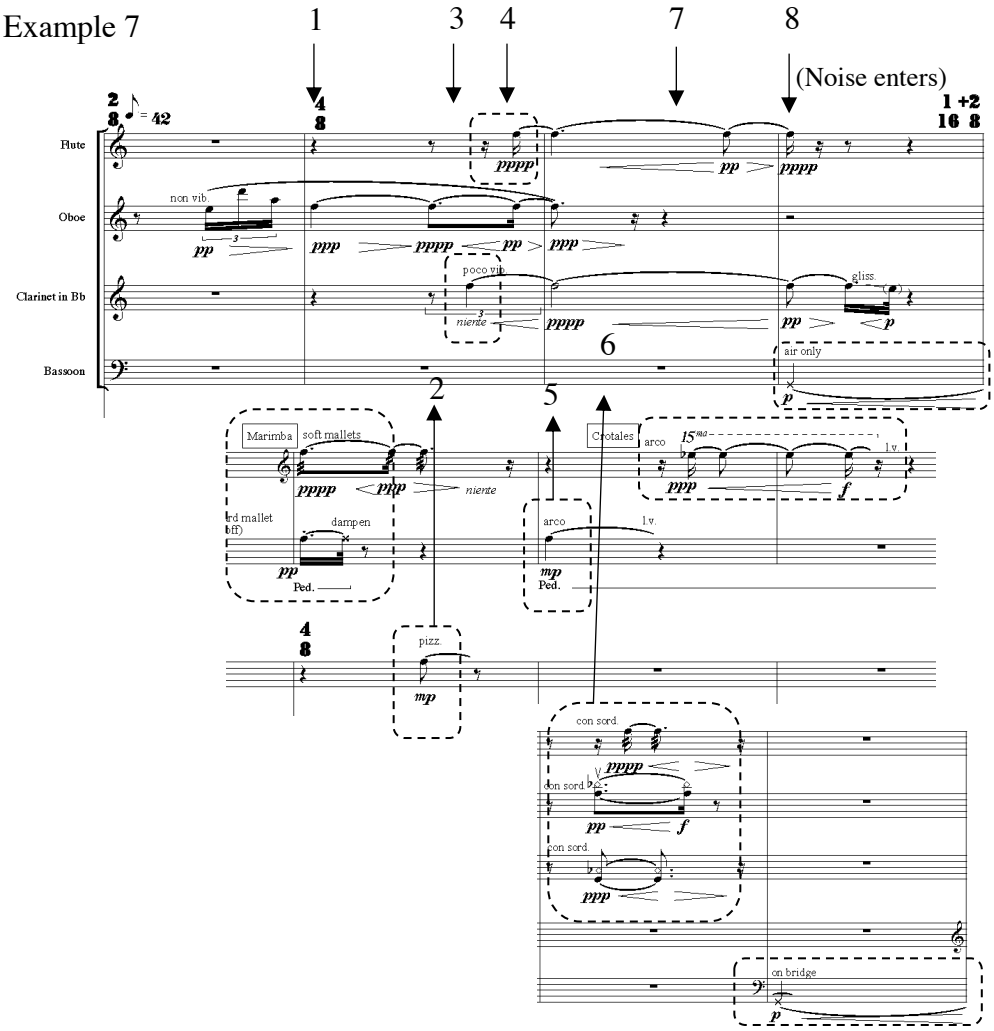
[56] Huang, Binhong. The Artistic Notes of Huang, Binhong, edited by Nang, Yu, Ho Nan: Ho Nan Fine Art Press, 1998, p. 30.

[57] This is freely translated and paraphrased by myself. The original text is as follows: 筆有回顧，上下映帶，凝神靜慮，不疾不徐.

[58] Water stains on a wall is referred when Huang discusses "Remain". It is the metaphor that represents the highest level of calligraphy.

is comprised of three timbral layers of wind instruments, percussions, and string instruments. While the overall speed is very slow, the rate of changing timbres is very dense but flexible. The following Example 7 indicates how it is moved.

Example 7

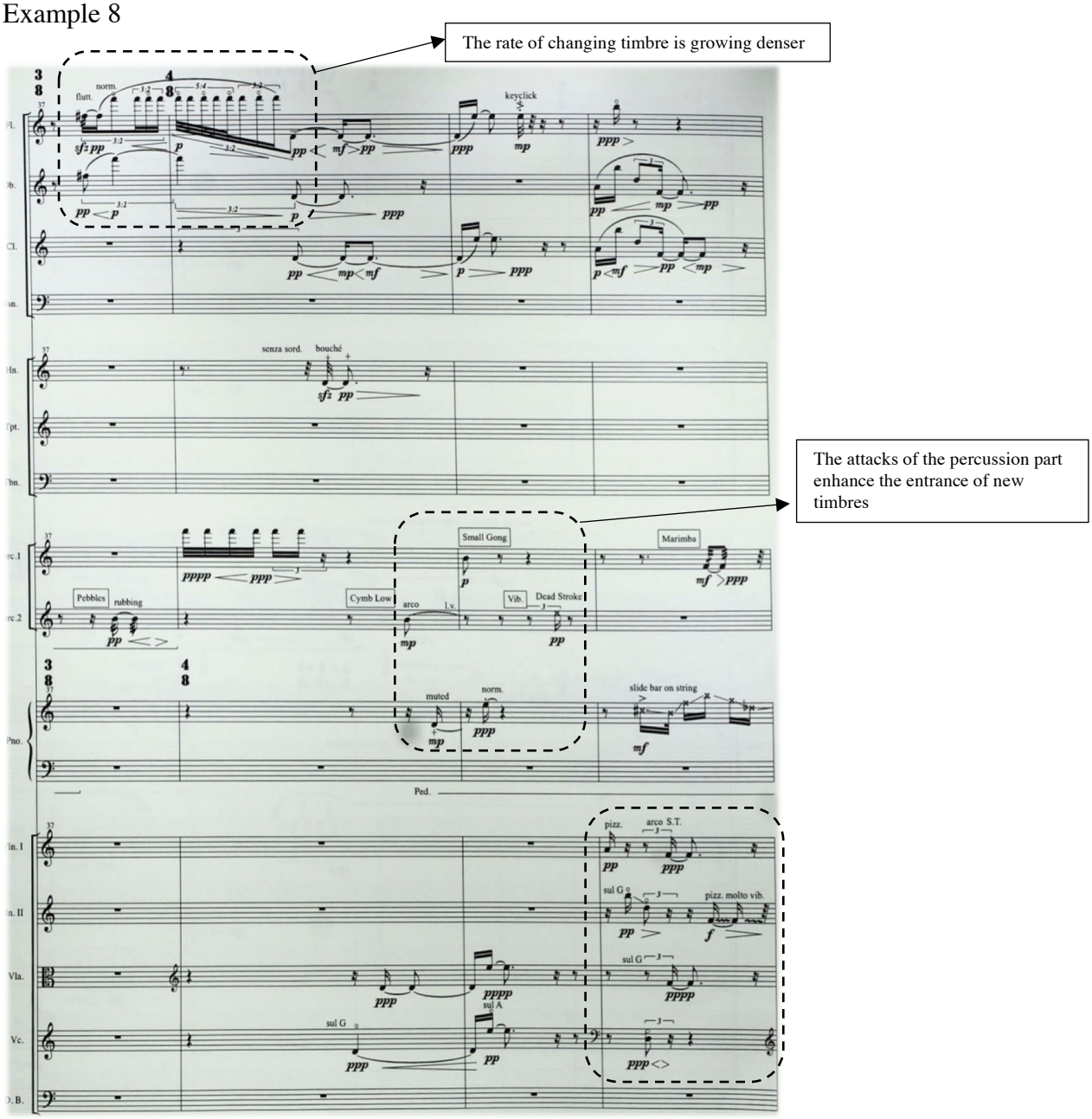


At Example 7, each arrow indicates the entrance of the new instrument(s) and the change of the overall timbre. There are eight times that the overall timbre is changed. If we can observe each time the timbre is changed, we may be able to feel the rate of changing color in sound, which is like the inner pulses free from the frame of musical tempo. The duration of each timbre is not equal as the rhythmic value. We could clearly perceive that the rate of the change is starting from the very slow to the very dense of the middle point, and gradually decreasing when

it towards to the end of the phrase. So, in this way of listening, we can even imagine how the stroke of slender gold style is written by sensing the inner pulses of the change of timbre.

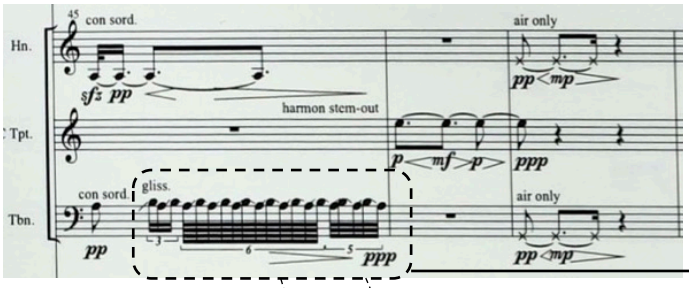
Throughout the first section in *Brush-Stroke*, there is a tendency that the rate of the timbral change is growing denser, and the entrance of each new timbre is more clearly articulated and heavier. For example, at mm. 37-40, the rate of timbral change is more complex and faster so that we might somehow perceive it as the sound of blending color (See Example 8).

Example 8

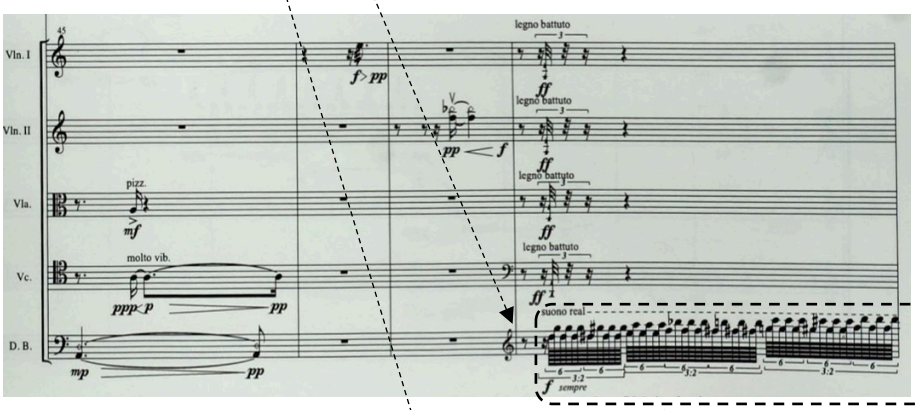


With growing density of the changing color, we can see that the change of timbres is shifted from the range within wide variety of instrumental groups to focusing on the individual instrument, which dramatically enhances the kinesthetic quality of the single instrumental color. At mm. 45-51, Liang begins to develop the gesture of the faster and wider pitch movement to respond to this growing density of timbral change (See Example 9).

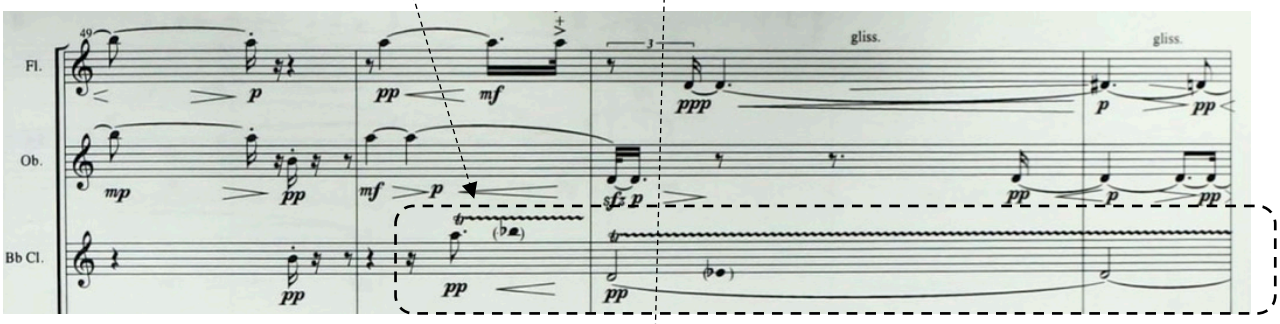
Example 9

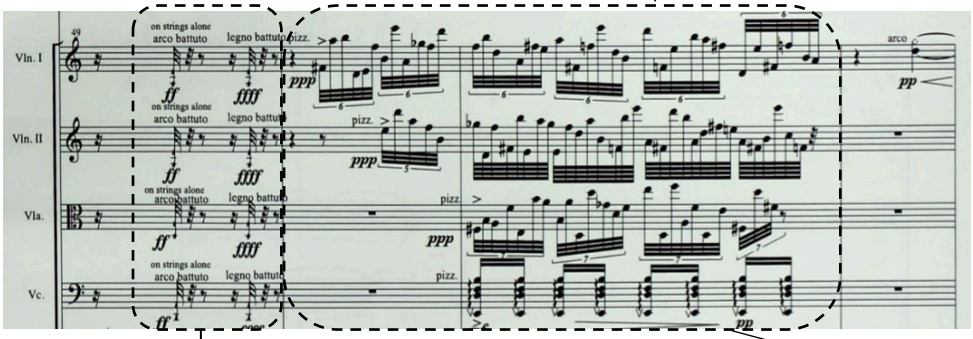


The trombonist first starts playing a trill-like gesture with glissando technique, which triggers a series of other gestures, such as the rapid tremolo of double bass and the trill in wind part.



In double bass, the pitch movement is more active than that of trombone. The rhythm is also denser like the technique of tremolo.





The string technique of "*acro battuto*" might suggest the heavy stroke of "Zhong" referred by Huang.

The pitch movement in this string part is the widest and the most active in the whole first section. Interestingly, each part is the condensed version from the previous pitch materials in the beginning part of the first section.

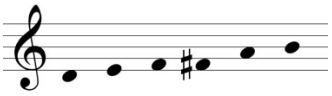
Following with this increasing intensity of the timbral variation and pitch gestural movement towards the end of the first section, Liang is probably trying to transform the texture of slender gold style to the wild cursive style of Huai-Su in the second section.

III. The Second Part of *Brush-Stroke* – Wild Cursive of Huai-Su

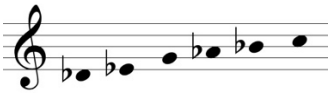
In *Brush-Stroke*, the construction of pitch structure is comprised of two hexachordal groups which are respectively arranged to the two sections of this piece (See Example 10 below).

Example 10

First section:



Second section:

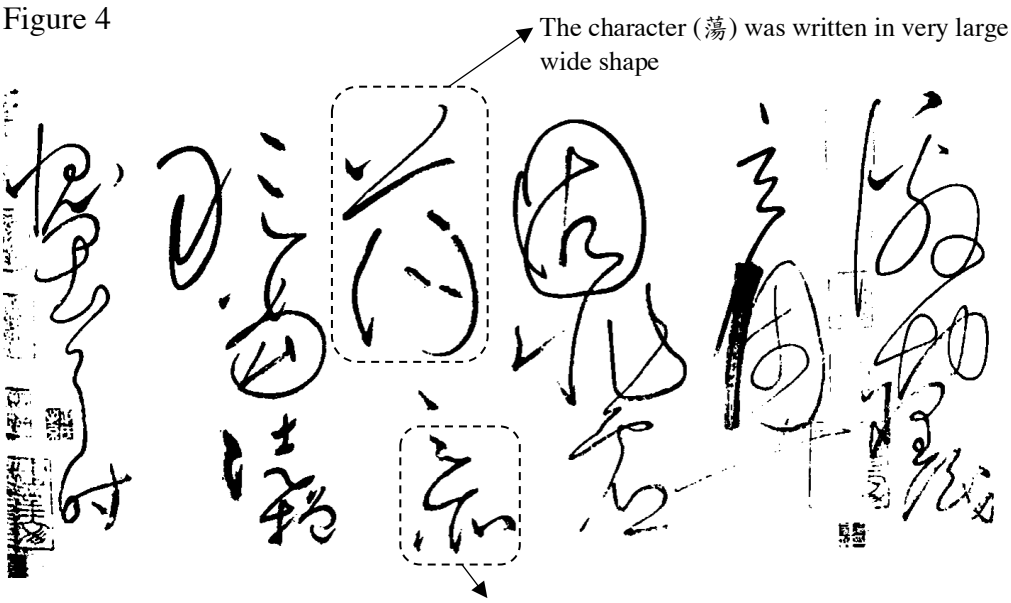


In Example 10, these two hexachords are the subdivisions of all twelve tones. Based on the arrangement of two hexachordal groups, the first section and the second section are formed the relation of pitch complementation, which serves to provide the structural element of the whole piece. More importantly, the composer uses these two hexachords as the prototype of pitch materials to combine with different linear shapes and rhythmic structures to represent the gesture of calligraphy. In the second section, the most important characteristic is that Liang gesticulates this hexachord to reflect the dramatic movement of wild cursive style of Huai-Su. So, with this pitch material as the reference, I observe that Liang might transform at least two important features of Huai-Su's cursive work into the second section of *Brush-Stroke* – first, the technique of one-line calligraphy; second, the dramatic variation in character size.[59]

[59] Adele Schlombs, Huai-Su and the Beginnings of Wild Cursive Scripts in Chinese Calligraphy, p. 63.

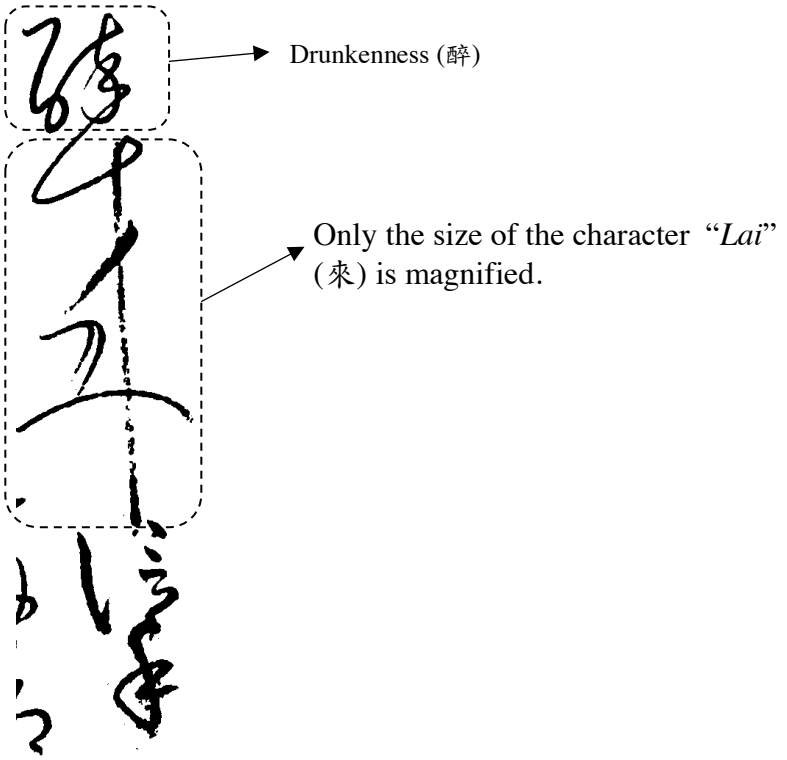
In *Autobiography*, Huai-Su also uses different character sizes and shapes to enhance the expression of the dramatic element and emotion. Such difference in each character forms its unique shape as if each of them has their own life and weight. Thus, some characters are very big and wide that occupy a large space, while other small and narrow characters are forced to be placed at the edge (See Figure 4).

Figure 4



Sometimes, Huai-Su varies the size of the particular character in order to reflect the content of the context, expressing his emotion while writing the script. The following Figure 5 shows one example from his *Autobiography*.

Figure 5



This example in *Autobiography* is the quotation from the Censor Hsu Yao who tells us that Haui-Su was sometimes exhilarated by wine, and then he would just rely on his hand and write two or three columns. The whole quotation is translated by Schlombs as follows:[60]

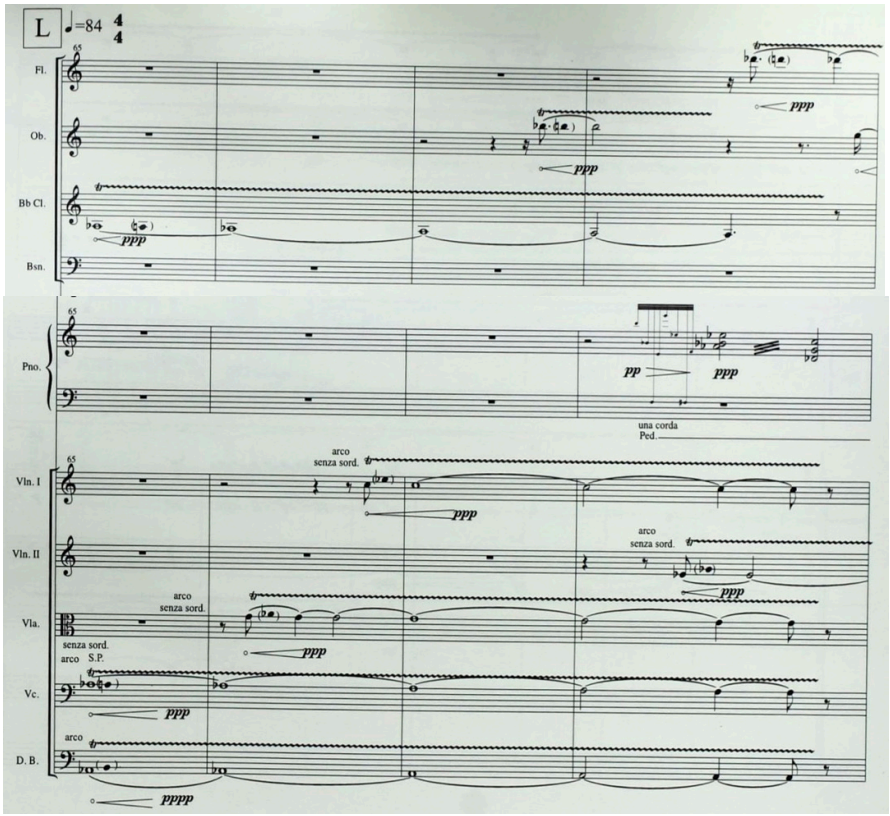
The Censor Hsu Yao wrote: His aim is a novel and unique style, so for him there can be no fixed rules; his style is sinewy, conveying a flavor of antiquity but sometimes, halfway through the line, the ink runs out. Exhilarated by wine, he just relies on his hand and writes two or three columns; Being sober again, he tries to write, but is unable to write.

Schlombs suggests that the possible reason why Huai-Su gave the prime importance to the second character "*Lai*" (來) instead of the first key word, "drunkenness" (醉), is because he wants to create the dramatic effect that the character "*Lai*" is actually resulted from the drunkenness, suggesting an intense momentum.[61]

[60] Ibid., p. 56.
[61] Ibid., p. 65.

In *Brush-Stroke*, this idea could be observed in a way that how Liang designed the sonic gesture based on the second hexachord. In the beginning of the second section, we can hear that the pitch material of the second hexachord is represented in many different ways. For example, at mm. 65-68, the trills in wind part, piano, and string part are all comprised of the second hexachord (See Example 11 below). This part forms the important background material of the second section.

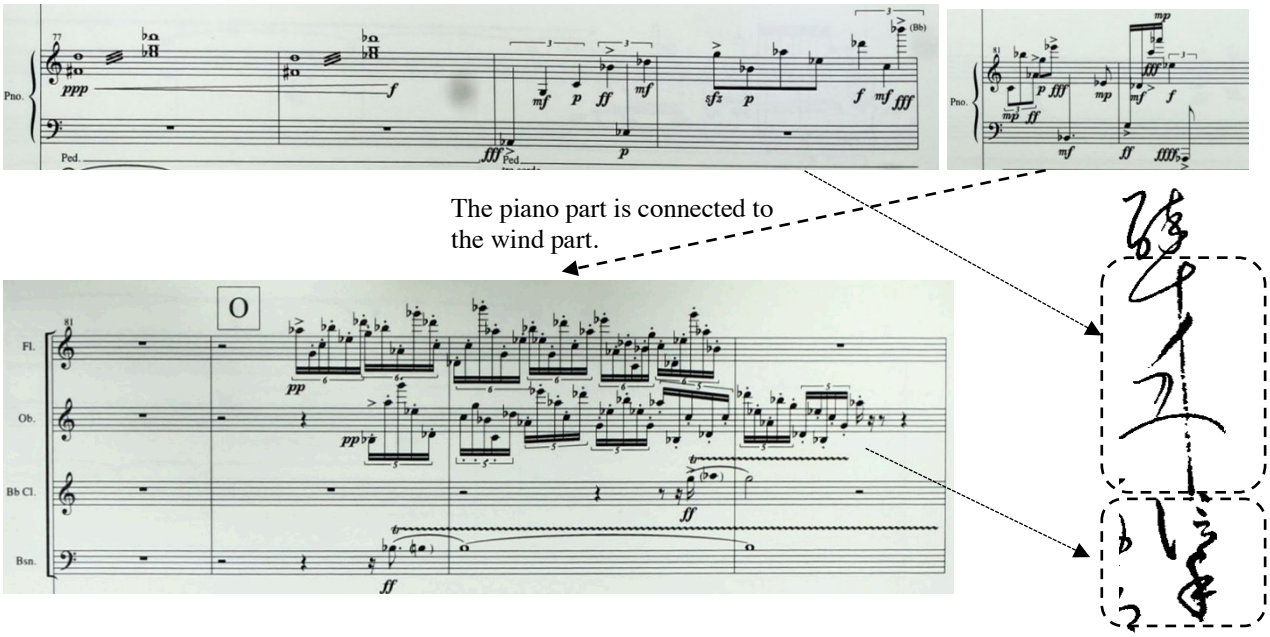
Example 11



At mm. 79-82, the hexachordal material is first gesticulated in the piano part with a very large intervallic leaping and wide range of dynamic fluctuation, suggesting the large character written in wild cursive style. Also, I observe that this passage of the piano part progresses with a clear direction from the lower to the higher register, directing our attention to listen to the extremely

dense texture of the wind part in the high register at m. 82. The following Example 12 shows the trajectory how the gesture of piano part gradually moves to the wind part.

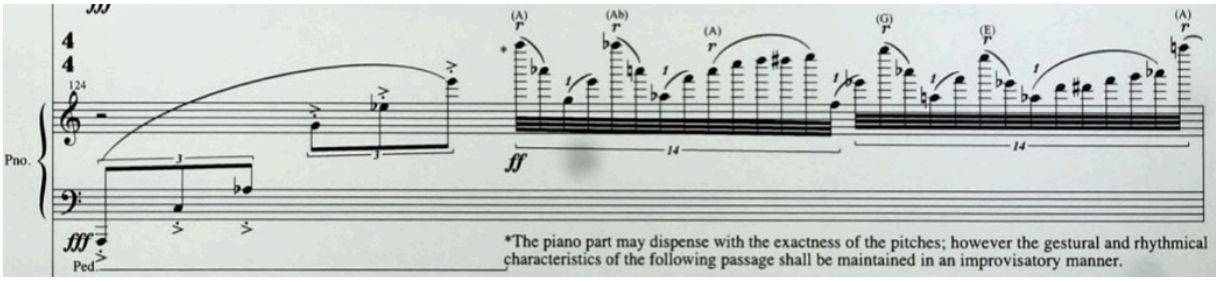
Example 12



Only when we hear the whole passage from m. 79 to m. 84, we can perceive the gradual evolution of the gestures from the piano to the wind part as if in Hua-Su's calligraphy, the large character is fluently flowing into the smaller and dense character without interruption (See the right part of Example 12).

At mm. 124 to the end of the whole piece, the piano part bursts out with the frenzied gesture in the extremely fast speed. As noted on the score, this part is played in an improvisational manner. While the exactness of the pitches could be dispensed, the gestural and rhythmical characteristics shall be maintained (See Example 13 below).

Example 13



According to Liang, the idea of improvisation strongly suggests Huai-Su's cursive work in which most characters are simplified and fused together because of his intense and fast brush movement[62]. Interestingly, this passage might not only represent the image of cursive, but the wild gesture of the improvisation played by the pianist is also similar to Huai-Su himself when he was writing. Also, since all the complex gestures and the fast rhythmical movement are all put into one instrument, this passage produces a highly concentrated moment that immediately draws our attention from the whole ensemble to the specific spot where the piano is set. In the whole piece, the construction of the sonic brush is almost relied on the sounds from the multiple instruments. So, this passage of the piano part seems really unusual, yet full of surprise and power. This part reminds me of the technique of one-line calligraphy in Huai-Su's work. The shift of the focus from the group of instruments to the single one instrument, piano, is really similar to this technique which all the characters are fused into the one eruptive curve and playful wave.

After the music of Chou, Liang is probably the first composer who consistently works on this idea of combining the art of calligraphic with music. Furthermore, he is able to transform the intrinsic beauty of the calligraphic line into the sound without directly modeling the exact technique or the painting. So, one might be able to grasp the idea of his music even if he or she

[62] Yayoi Uno, Liner Notes to *Brushstroke* by Lei Liang. New York: Record Modes, 2009.

doesn't read the program note or know about the details of calligraphic principles. Liang might find the shared elements between the visual art and music and knows how to guide us to use our ear to listen to these elements his musical works. As he refers, even though the calligraphy is a very useful material to inspire composers to create the musical work, we should always go back to the sound itself; to think about how the line can find the expression in the sound[63] -- otherwise, the musical works might always need to rely on the redundant explanations and we will not be able to appreciate it as the work itself, which is problematic.

The study of this topic reveals some salient features of the works employing the idea of calligraphy. With the musical works of Hosokawa, guqin, and Chou as our foundation, *Brush-Stroke* is a very meaningful step because it shows the different way that how the composer could employ the idea of calligraphy into the music without over relying on the principle of calligraphy. Unlike the complex system of variable mode in Chou's music, Liang moves to explore other musical materials to establish the intricate network of timbral transformation, dynamic fluctuation, and rhythmical pulses based on the simplicity of the pitch material. Every moment of this piece is simple and spontaneous, yet disciplined and intricate if we delve into the details of its structure. Undoubtedly, *Brush-Stroke* is the crystallization that transcends the boundaries between visual art and music, which reveals us the new path of sonic journey.

[63] As Liang writes in the program note of *Aural Hypothesis*, he wants to create the line in a basic and primal way, for example, a simple curve or a straight line.

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Response to Question II

With the advancement of technology, composers are able to accurately realize the essential beauty of the environmental sound and to employ it as part of their compositions. The introduction of Edgard Varese's "organized sound" is an example showing how composers alter their approach toward the sound itself when the knowledge of acoustic theory began to be accessible at that time. Under the influence of this concept, more and more possible materials have been revealed and cultivated by composers. For example, in the essay, *The Art of Noise* (1913), the Italian Futurist, Luigi Russolo, had pointed out that the environmental noise has great potentials to be part of the musical work. Another extraordinary case could also be found in the notion of Musique Concrète (concrete music), created by Pierre Schaeffer, which was considered as the revolutionary idea at that time. The compositional approach of concrete music is to first explore the possible materials from those selected recorded sounds and to use the technique of collage to combine several excerpts to create a new musical work. The works of Schaeffer greatly inspires Murray Schafer, the active Canadian soundscape designer and composer, who proposes the concept of *schizophonia* to describe the idea that the natural sound itself could exist without its sound maker. It brings out the possibility that the meaning of the sound no longer needs to be bound with its origin, but could be perceived, understood, and appreciated as the pure sonic form itself. With the legacy of Schaeffer, the Japanese composer, Toru Takemitsu, also tries to combine his musical work with the environmental sounds by directly working on the features of soundscape and recording materials. Other example, such as the American composer John Luther Adams, whose music is deeply rooted in the natural world, creates a wide variety of musical genres, such as film music, electronic music, sound installation and instrumental works. In his work, he tries to create the work to connect himself with the environment, especially the landscape of Alaska he has been living for many years.

In this study, I'm interested in studying how the environmental sound is realized, employed, and transformed by the composers, as well as in the way which composers could establish their unique soundscape in their works based on the unique perceptions of the environmental sound. To respond to this question, I will first discuss the composition and idea of Pierre Schaeffer to examine how the environmental sound was developed by his progressive compositional methodology. Secondly, I will direct to analyze the works composed by Toru Takemitsu, Murray Schafer, and John Luther Adams, with my personal observation in order to examine how the environmental sound metaphorically means to them and how they respond to it. This approach could bring us a concrete study that how the environmental sound was first studied and revealed to them and whether the integration of environmental sound in their works could be effectively perceived and realized by audiences.

Pierre Schaeffer and Musique Concrète

In 2018, I began working on my electroacoustic piece, *Diffusion of Oceanic Reverberation*, in the seminar, Hearing Seascape, led by Lei Liang. This is the great project that we have the chance to have access to the sound recording of creatures in ocean, such as Whale sounds, shrimp sounds, boing sounds from Rockfish, and wave sounds, from Scripps Institution of Oceanography, and we could use these recordings to construct our own sonic world. We also have the privilege to cooperate with the visual artists from Calit 2 to create the musical works based on the 3D video they provided. In this way, we are able to allow audience to appreciate our works not only through the ears, but also through the eyes. In my composition, I tried to distort and vary the quality of the recordings to reveal how these sounds could be developed as totally new sonic objects. It is through this project that makes me realize that our environment has such rich sonic materials. We, as a composer, with knowing about how to manipulate these sounds are

actually placed at the very advantageous position that we can refine and shape these materials to form the crystallization of work that we are always envisioning.

With this experience, I become more interested in composing with existed recording materials. This is the first step for me to think about how I could employ these sonic materials from our environments to create a work responding to what nature speaks to us. Thus, the study of Pierre Schaeffer (1910-1995) and his compositions of concrete music serves as a very important starting point to my preliminary research. In his *In Search of a Concrete Music*, the concept of Musique Concrète is clearly defined by Schaeffer as the following Figure 1. It shows the difference between ordinary music and concrete music: [64]

Figure 1

ORDINARY MUSIC *(so-called abstract)*	NEW MUSIC *(so-called concrete)*
PHASE I. Conception (mental)	PHASE III. Composition (material)
PHASE II. Expression (notated)	PHASE II. Drafts (experimentation)
PHASE III. Performance (instrumental)	PHASE I. Materials (making)
(from the abstract to the concrete)	*(from the concrete to the abstract)*

As Schaeffer refers in the Figure 1, the "so-called abstract" is applied to ordinary music because the abstract musical idea is initially conceived in the mind by composer, then wrote it down with the strict notation system, and performed by the real instruments to become the concrete work. In concrete music, on the other hand, composers start only from collecting the existing elements, such as sound materials, noises, or the recording of other musical sound. Through carefully listening to these materials, they discern the features and patterns of these sounds and then start

[64] Pierre Schaeffer, In search of a concrete music, p. 27.

composing with them by the technique of montage.[65] Finally, the complete composition generates its own form based on the materials that composer chooses. At this point, the process of composing in the notion of Musique Concrète is reverse from that of ordinary music. They start from the concrete materials, and through the process of experimentation, the result, the composition itself, is abstract.[66] This idea greatly resonates with me since, in my work, I also started from the concrete sounds from the ocean, and use these materials to construct the new sonic world. However, one point that Schaeffer differs from me is that the meaning of the sounds in my composition are still closely bound with their original environment – ocean. That is, when people hear the whale sound, I intended to let them think of it as the whale. As for Schaeffer, his attitude toward the environmental sound is very progressive, because he is interested in exploring the most basic element of the sound (or its acoustic object) and treating them as the pure sonic materials to compose without relying on its origin. As Murray Schafer points out, Schaeffer's interest in sound object is not what it comes from, but what it is. He writes: [67]

> Schaeffer doesn't want to confuse the study of sounds by considering their semantic and referential aspects. That a bell sound comes from a bell doesn't interest him. To him, it is a phenomenological sound formation only. The sound object must not be confused with the sounding body by which it is produced, for one sounding body may supply a great variety of objects whose disparity cannot be reconciled by their common origin.

For this reason, Schaeffer is at the unique position which no other composers could be paralleled with. He was trying to encourage his audience to recognize the sound as itself as if it has its own semantic meaning. This semantic meaning couldn't be explained through our language or conventional system, but the acoustic phenomenon itself. If we still try to understand the sound

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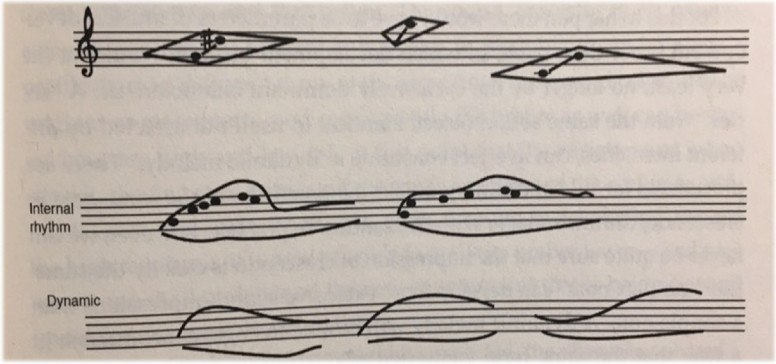
[65] Schaeffer defines Montage technique as follows: it consists of assembling sound objects by simple juxtaposition, and in particular by gluing fragments of tape recordings end to end.
[66] Pierre Schaeffer, In Search of a Concrete Music, p. 28.
[67] Murray R. Schafer, Our Sonic Environment and the Soundscape – the Tuning of the World, p. 151.

only through what it comes from and even what the conventional function it should be, such as the notion of pitch in tonal music, then we no longer have the direct contact with the idea of concrete.[68] This is also true that in Western tradition music, as Schaeffer criticized, the idea of pitch domain has dominated the overall development of music which keeps us stuck in the "one-dimensional music" for too long.[69] So, by taking us back to the fundamental nature of the sound or noise, he suggests that we should examine the environmental sound based on these three planes: 1. tessitura, 2. dynamic, 3. spectrum, instead of pitch, duration, and timbre. With this idea, the basic sonic unit in Schaeffer's concrete music works is not the pitch, but the "complex note". Any element in a monophony that has a fairly clear beginning, continuation, and termination is called a complex note, by analogy with a musical note.[70] He takes the technique of rubbing the piano strings with a finger as example, describing that if we just listen to the sound itself, not the individual pitch in the chromatic scale produced by rubbing, the speed of rubbing, the pressure on the strings, the thickness of the sound mass based on the number of strings that is rubbed, can altogether be perceived as a single sound object or noise.[71] Using this sound object as the basic unit, he is able to play it by different ways of manipulation to transform the intrinsic form of the object and make a series of variation (See the Figure 2). [72] In the following part, I want to focus on the composition of Schaeffer to examine how the notion of complex sound is developed.

[68] Pierre Schaeffer, In Search of a Concrete Music, p. 150.
[69] Ibid., p. 167.
[70] Ibid., p. 192.
[71] Ibid., p. 136.
[72] Ibid., p. 137.

Figure 2

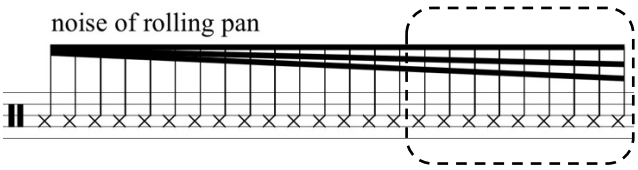


I. Five Studies of Noises (Cinq études de bruits)

The idea of complex note could be clearly perceived through listening to Schaeffer's notable collection of concrete music works, *Five Studies of Noises* (*Cinq études de bruits*). The five etudes were composed in 1948 in a form of electroacoustic music. They were finished at the studio where Schaeffer established at RTF, Radiodiffusion-Télévision Française (which is now replaced by ORTF, Office de Radiodiffusion Télévision Française). In this part, I want to focus on the last movement regarding the use of sonic material and its development.

In the last movement of the collection - sauce pans, canal boats, singing, speech, harmonica, piano, the noise of rolling sauce pans is served as the primary "complex note" that Schaeffer used to develop to relate to other sonic materials. The most essential element of this "complex note" (rolling sauce pan) is its rhythmic pattern. It goes from the slow to the fast rolling pattern until the pan totally lies down on the ground. The following Example 1 shows my rough transcription of this complex note:

Example 1



The sound resulted from this particular physical phenomenon provides the chance for Schaeffer to connect with the constant noise of canal boats. He simply takes the faster part of the rolling pan and repeat it for many times. It creates an interesting phenomenon that, psychologically, we might forget its original sonic source and tend to perceive this repeating sound as the new sonic object. Schaeffer points out this phenomenon as follows:[73]

> Every sound phenomenon can be taken for its relative meaning or for its own substance. As long as meaning predominates, and is the main focus, we have literature and not music. But how can we forget meaning and isolate the in-itself-ness of the sound phenomenon? There are two preliminary steps: First, distinguishing an element (hearing it in itself, for its texture, matter, color) and, second, repeating the same sound fragment twice: there is no longer event, but music.

So, once the specific part of the sound of rolling pan is extracted, this part itself is also isolated from its origin. Then Schaeffer repeats this particular part of sound by editing the tapes to further enhance its sonic characteristic until we perceive it as the new musical idea. It is this moment when this selected sound is emancipated from its origin, Schaeffer is able to connect it with other sounds, such as harmonica, and canal boats, making it as if this new sonic idea can travel around different sources without boundaries. At this point, when this complex note is fully developed, it creates what Schaeffer calls the concept of "larger note" in which the starting sonic idea is expanded into several larger groups where we may still identify its original form of complex note.[74] Larger note and complex note are the concepts that allow us to analyze how the piece is developed to generate a clear recognizable sonic trajectory based on the combination of different sound materials (The following Figure 4 shows the design of larger notes from the draft of Schaffer).[75]

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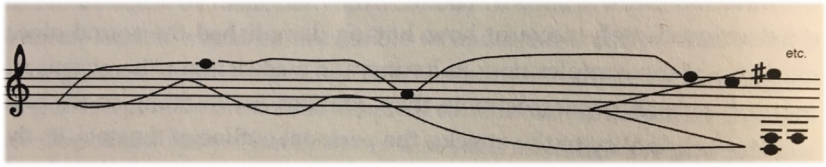
[73] Ibid., p. 13.
[74] As Schaeffer explains: A complex note is called a "larger note" when its attack, continuation, or termination is sufficiently developed. If the development goes beyond a certain point, it will tend to become a group, and it will be possible to analyze its development in rhythm, timbre, and tessitura.
[75] Pierre Schaeffer, In Search of Concrete Music, p. 140.

Figure 4



So, in this piece, we don't try to recognize what their original sources are. Rather, Schaeffer provides a unique environment for us to experience the intrinsic quality of the sound. This mode of listening is called by Schaeffer as *reduced listening*. The experimental composer of concrete music and film theorist, Michel Chion (1947-), as the former assistant of Schaeffer, further elaborates that reduced listening takes the sound – verbal, played on an instrument, noises, or whatever – as itself object to be observed instead of as a vehicle for something else.[76] He suggests that this idea has great potentials in opening up our ears and sharpening our competency of listening, which is very helpful for filmmakers and technicians to get to know how to manipulate these sonic materials to properly connect with the causal elements. In addition to reduced listening, Michel also talks the other two modes of listening: *causal listening* and *semantic listening*,[77] to fully elaborate that how we usually perceive the environmental sounds. Causal listening refers that listening to the sound in order to gather information about its cause. When the cause is clearly visible, it might somehow affect how we understand the sound and we may ignore its fact of acoustic elements since our fixed impression of this visible object limits our desire to explore and imagine the matter of sound. This is the most common way how we listen, which is also the listening habit that Schaeffer encourages us to overcome and challenge.

[76] Michael Chion, *Audio-Vision – Sound on Screen*, edited and translated by Claudia Gorbman (New York: Columbia University Press), p. 29.
[77] Ibid., p. 25.

Semantic listening, on the other hand, is referred as the ability to listen to a code or language to interpret a message. At this point, Michel points out that the basic unit of the language, phoneme, is not always being understood as its acoustical properties, but as small part of an entire linguistic system. Thus, semantic listening often ignores considerable differences in the language in question.

In concrete music, Schaeffer's use of environmental sound as the basis for musical composition is the very important idea that leads us to think about the matter of sound in very different way. His experimentation with sound reveals the possibility that all the noises in our environment may have the potential to be musical. Depending on the way that how we manipulate these raw materials, even the noise of train or the rolling pan could present a very fascinated rhythmical quality. Schaeffer creates a unique sonic environment where we perceive each sound or noise as itself, not as its origin. At this point, listening plays a very important role in the realization of these sounds, which greatly influences those composers who work with the concept of soundscape. With the influence of Schaeffer, the following part will be focusing on the work of Schafer to reveal that how the environmental sound, especially the sonic materials of onomatopoeic word, could be integrated into his musical language.

Murray R. Schafer – A Garden of Bells

Murray Schafer has achieved international reputation and been very well known as a composer, soundscape artist, and ecology musician. In his remarkable book, *Our Sonic Environment and the Soundscape - The Tuning of the World*, he predicted: by the end of the century music and the soundscape would draw together.[78] With the great respect of the natural sound, he is also probably the first composer who endeavors to cultivate the notion of soundscape and try to create a space that all kinds of sound, including natural and artificial

[78] Murray R. Schafer, *Our Sonic Environment and the Soundscape – The Tuning of the World* (Rochester, Vermont: Destiney Book, 1994)

sound, could harmoniously exist together without aggressively interrupting with each other. In Schafer's compositional output, I could always find his conscientious attempt to employ the environmental sound into his musical works by using various approaches. The piece, *A Garden of Bells* (1983), that I want to discuss in this part, focuses on how Schafer transforms the bell sounds based on the concept of soundscape that he referred in his writting to the musical work.

I. A Garden of Bells – A Soniferous Garden

Soniferous garden is the place where Schafer imagines that all the natural sounds, including birds chirping, water sound, wind, etc., could be harmonized together by the meticulous arrangement of acoustic designer. As Schafer points out, parks today are not well designed and always invaded by the noises from outside the parks, including street noises and traffic sounds. Schafer proposes the idea of soniferous garden as follows: [79]

> we should insist on the necessity today to throw the emphasis back to the acoustically designed park, or what we might more poetically call the soniferous garden. There is but one principle to guide us in this purpose: always to let nature speak for itself, these are the natural materials which like the trees and shrubs must be organically molded and shaped to bring forth their most characteristic harmonies.

The idea of soniferous garden is then introduced to as the inspiration for his choral piece, *A Garden of Bells*. He said: I have in mind a scene which does not really exist - a soniferous garden filled with bells of all shapes and sizes, through which the traveler might wander at leisure and be entertained by a tintinnabulation of sound.[80] In this work, the transformation of the bell sound to vocal sound is made through the technique of onomatopoeia. Schafer creates various kinds of bell-words to indicate different qualities and sizes of bells. Some onomatopoeic words are derived from different countries, such as Hungarian, Indonesian, Spanish, Sinhalese,

[79] Murray R. Schafer, Our Sonic Environment and the Soundscape – the Tuning of the World (New York: Knopf, 1977), p. 246.
[80] Murray Schafer, *A Garden of Bells*, Bancroft, Ontario, Canada: Arcana Editions, 1984.

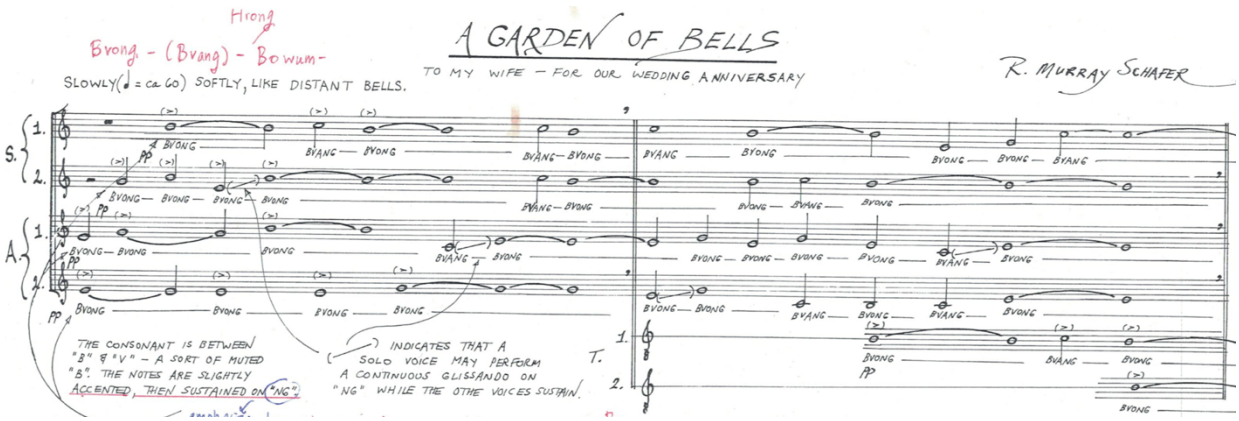
Swahili, etc. With the unique setting of the text, its sonic connotation allows us to imagine each of them as the bells from different musical cultures. In addition to the use of onomatopoeic words, the overall textural design of *A Garden of Bell* reflects the idea that how bell sounds travel through space and how they vibrate with different resonance and timbre. Moreover, its dynamic arrangement also suggests the spatial aspect of the bell in a given environment. Let's first look at how the sound of onomatopoeic word is used and developed in this piece.

II. Onomatopoeic Word

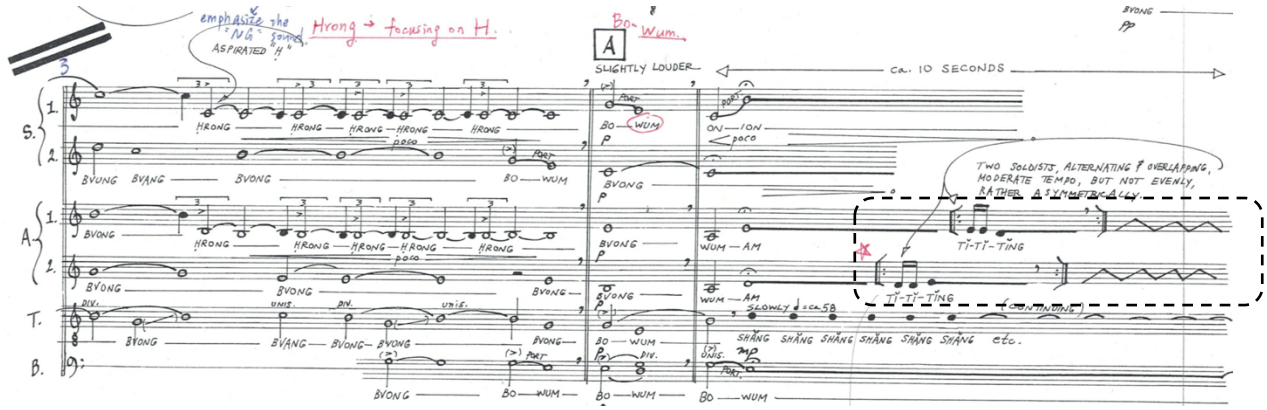
Onomatopoeia is an important tool that Schafer uses to transform the bell sound to the vocal sound. In this piece, Schafer discerns the vocal characteristics of onomatopoeic word and discovers its similarity with some features in the particular bell sound. For instance, the onomatopoeic word, *Bvong*, in the opening passage is explained by Schafer as the follows: The consonant is between "*B*" and "*V*" – A sort of muted "B". The notes are slightly accented, then sustained on "*NG*".[81] With this special pronunciation and the way of singing, we could hear a soft attack transient beginning and the resonant body in this sound. Also, this word is assigned with a long and soft sustained chord, creating an impression of the large and deep bell. (See Example 1 below) For the smaller bell, Schafer uses the onomatopoeic word with short vowels and sharp consonants, such as "*Ti-Ti-Ting*" at m. 5. (See Example 2).

[81] Ibid.

Example 1

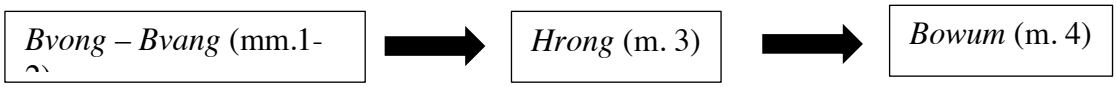


Example 2



In Example 2, the "*Ti-Ti-Ting*" is sung with a short rhythmic figure exchanging with the other voice in the alto part. Interestingly, such onomatopoeic word may change and vary within the overall progression as though the resonance of bell sound naturally distorts and decays in the real time. For instance, the word, "*Bvong*", is varied through the change of vowels or consonants. Through the transformation of this word, Schafer is able to introduce and insert other onomatopoeic words with the similar sonic shapes in the process of transformation. The following Figure 1 shows the trajectory of the variation in *Bvong* and its connection with other onomatopoeic words.

Figure 1

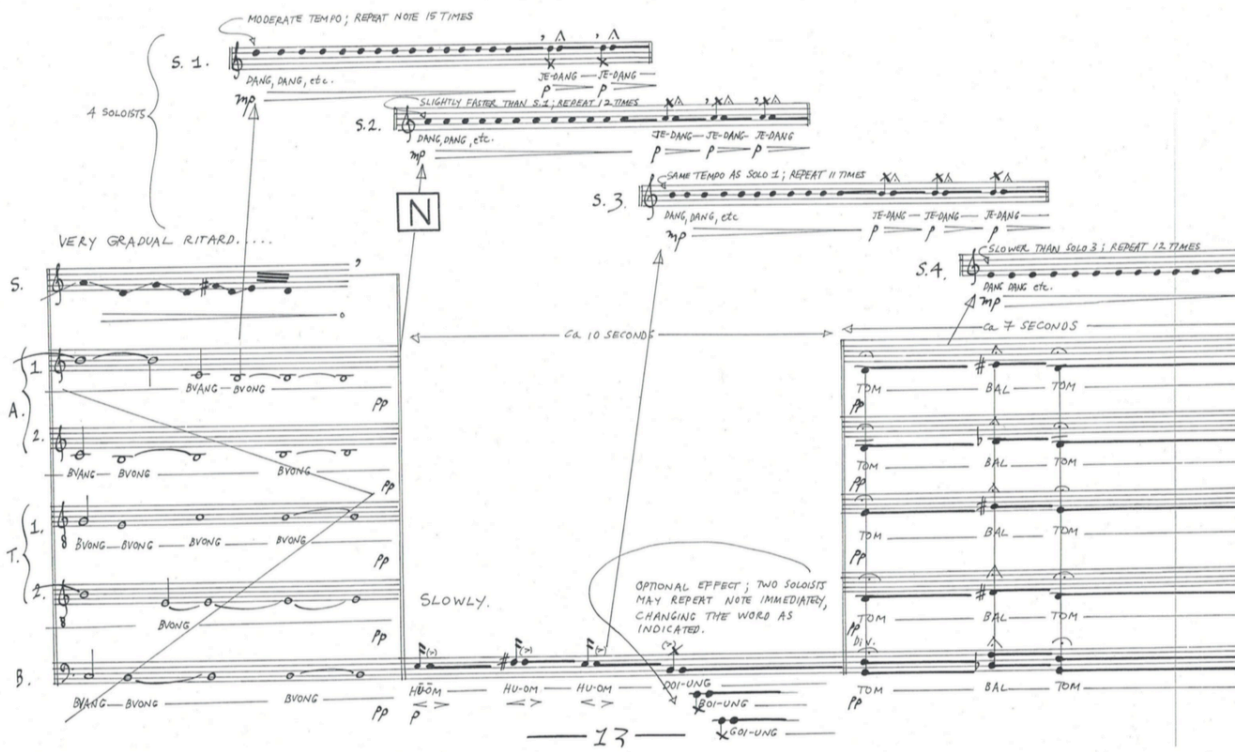


In Figure 1, we could trace the development of the sounds from "*Bvong*" to "*Bowum*". Another example such as the passage at the m. 8, the tremolo-like figure might be directly derived from the vowel part of onomatopoeic words, "*Ti-Ti-Ting*", which is originally played as short and quick melodic figures at m. 5. So, the use of onomatopoeic words is not only the mere imitation of the environmental sounds, but it also serves to provide the sonic elements for the overall organization of pitch, rhythm, harmony, and texture.

III. Textural Design of Onomatopoeic Sound

In this piece, the interaction between the bell sounds produces a wide variety of textures. Since each onomatopoeic word possesses its unique sonic characteristic, Schafer combines some onomatopoeic words to establish the soundscape where its spatial relationship among these materials is based on Schafer's careful organization of the rhythmic activity and pitch registers. One of the outstanding textures that includes the large bell sound and the small bell sound is presented at the rehearsal mark N. (See Example 3 below).

Example 3



In this part, the sounds, "*Bvong*" and "*Tombal"*, are treated as the background material as in the beginning passages, whereas other soloists who sing the onomatopoeic word, "*Dang*", with repetitive notes are treated as the foreground materials. As we could see, to make sure that those two bell sounds could be blended smoothly, the sonic material, "*Dang*", is arranged at the higher register than those of "*Bvong*" and "*Tombal*". Also, the sonic quality of soloist presents a clear articulation which, to some certain degree, is easier to be recognized as the sound near us. With this idea, Schafer smartly delineates the spatial relationship between these two bell sounds through assigning these words with different number of performers. This particular textural design may echo with the idea that how he defines the sonic materials in the soundscape.

Schafer points out that a soundscape could be perceived as two primary categories: *Figure* and *Ground*.[82] In his study of soundscape, the *Figure* corresponds to the signal or the soundmark, while the *Ground* is defined as the constant ambient noise surrounding the *Figure* – which may often be recognized as the keynote sounds – and the field to the place where all the sounds occur. The concept of *Figure* and *Ground* corresponds to this texture where the deep and long bell sound suggests the overall ambient sound of the environment and the small and short bell sound indicates the idea of *Figure*. However, in my point of view, the bell sound is always treated as the *Figure* in our environment, since it is the clear signal to inform people about the time, and for some places, the bell sound is usually associated with religion, such as church bell, and always evokes a sense of sacred emotion. We could always find a rich connotation and meaning of this kind of sound. So, as I listened to this piece, I observe that Schafer is able to change or alter the role of bell sound from its original function to create an unusual texture in which one may never listen to the bell sound in this way. In Example 3, I would rather perceive *Bvong* and *Tombal* as *Ground* instead of *Figure*; the *Figure* of bell is now changed to the *Ground* in this piece.

Furthermore, the change of the sonic meaning could also be found in the transformation of onomatopoeic sounds. A different onomatopoeic sound may suggest different associative meaning as this particular sound is created by people from different cultural background to assist their communication within their cultural circle. Sometimes, the same sound may be differently interpreted and transcribed as totally different onomatopoeic words if they use different languages or live in different places. In Figure 1, these three onomatopoeic sounds are from different cultural backgrounds, but the sonic transformation of these three words built by Schafer are definitely possible. At this point, we might think that Michel's semantic listening is the way

[82] Murray Schafer, *Our Sonic Environment and the Soundscape – The Tuning of the World*, p. 158.

to approach to this piece. However, the semantic understanding of these onomatopoeic words is not exactly the requirement for us to realize how these words are organized. Rather, Schafer is able to present the intrinsic sonic characteristics of these words and combine with the musical expression of vocal singing to represent his imagination of bell sound. Through the variation of these sonic qualities, different onomatopoeic words are layered and interwoven together to form a complex, yet beautiful texture. In this piece, semantic listening might only function as the instruction for us to approach the topic of the piece. Hence, as what Schaefer tried to achieve, Schafer might also use these words as purely sonic materials to reveal the nature of sonic fluctuation in the bell sound. As we could hear, some of onomatopoeic words are comprised of different vowels, which could be used to build the gradual growing of resonance of bell sound.

Schafer is like a gardener who endeavors to cultivate these sonic materials with his musical sensitivity and intuition. Eventually, he successfully creates an ideal garden as he imagines in *The Soundscape*, the soniferous garden. However, as we know, the natural soundscape in the real garden and musical works are totally different. The former is the environment that all the natural sounds move and transform freely by themselves, while the latter is an abstract musical work in which the sonic material is strictly organized by the composer through the meticulous treatment of the rhythm, dynamic, pitches, and textures. In *A Garden of Bells*, the sound itself is modified and crafted to be placed and framed in the rhythmic pattern and harmonic structure. Therefore, the natural sound is not likely to naturally speak for itself anymore since the composer has imposed their own compositional intention (which is totally artificial) on these sounds. This part of the topic presents one method of incorporating the environmental sound. In the following part, the presentation of some ideas of Toru Takemitsu might support us to explore more possibilities about how the environmental sound is employed.

Nature in the Music of Toru Takemitsu

Schafer's fondness for Japanese garden is very clear to observe in his writings about soundscape. In fact, he himself has visited Japanese garden, the one located at the Water Clear Temple in Kyoto. At that time, Schafer had the chance to meet with the Japanese composer, Toru Takemitsu, and learned from him about how those sonic materials, such as bells, bamboo water sounds, birds, are cleverly arranged in the garden. Schafer writes of this unique experience as follows: [83]

I recall walking through the ample garden with the composer Toru Takemitsu, beneath the *butai* platform where the great gagaku orchestras once performed. We followed the paths between the blossoms, listening to the birds and imagining how the ancient music must have sounded. Suddenly, I realized how cleverly everything had been laid out to facilitate the blending of the loud and soft sounds by means of the winding path.

The notion of garden is also served as an important metaphor in the composition of Takemitsu. And its multifaceted characteristics inspires Takemitsu in many different ways. Some works are focusing on the environmental sounds of garden, such as *Rain Spell* for piano, harp, vibraphone, flute and clarinet (1982) and *Garden Rain* (1974) for brass ensemble. Other works such as *Arc* for piano and orchestra (1963-66, revised 1976) presents the abstract idea that how the objects could be viewed and listened from different angles if we walk through different paths in the garden. Interestingly, though we know that both Schafer and Takemitsu are fond of the concept of garden, their compositional methodologies toward this topic are quite different. For Schafer, in his *A Garden of Bells*, the sonic materials, onomatopoeic words, are carefully designed and fused into his harmonic language. At this point, the composer puts the meaning into the sound, which changes and distorts its original natural state. At this point, the

[83] Murray R. Schafer, "Music and the Soundscape" from *The Book of Music and Nature– An Anthology of Sounds, Words, Thoughts,* edited by David Rothenberg & Marta Ulvaeus (Middletown CT: Wesleyan University Press, 2001), p. 62.

onomatopoeic word itself is also the mean invented by human to show how they semantically understand this natural sound and how they communicate it with others. Schafer is able to extract the characteristic of each onomatopoeic word to create a highly concentrated sonic crystallization with the incorporation of triad sonority. In his music, we could sense a strong intention of his love of the soundscape and how he recreates a new sonic world based on this idea.

For Takemitsu, he noticed that there is a certain degree of the distortion in the natural sounds if the composer tries to impose their compositional intention upon them. He quotes the words from Toshi Ichiyanagi (1933 -), the Japanese composer and pianist as follows:

> Motivation and process are important things. When a composer puts meaning into sound and invents fixed forms he objectifies himself through his own ego. Through his attitude, one is removed from his own time quality. The Self is there without inventing it. And that entity of Self-includes everything. It is not necessary to build fictitious reality.

Apparently, as Ichiyanagi points out, the ego of a human being is the primary cause to change the quality of natural object. Though Takemitsu partially agrees with his argument, he never rejects human's expression and am worry about if the expression may affect the quality of natural sound. Rather, he thinks that the expression itself is also an important part of the natural world. He writes[84]

> Expression never means separating myself from other things. To me, the world is sound. Sound penetrates me, linking me to the world. I give sounds active meaning. By doing this I am assured of being in the sounds, becoming one with them. To me, this is the greatest reality. It is not that I shape anything, but rather that I desire to merge with the world.

By embracing the nature, Takemitsu isn't afraid of giving his own expression to the environmental sound. Rather, he tries to make his own musical expression to merge with the nature. That is, he uses these sounds as they are, following their natural courses to develop his

[84] Ibid., 21.

own musical language. In the following part, I will focus on two works, *Garden Rain* and *Water Music*, to see how he integrates the concept and material of environmental sounds into his music. The purpose of this study is to reveal how the natural sound is understood and utilized by the composer. And through this analysis, we could also discover some similarities among the composers that I'm working on.

I. Garden Rain

As we mention above, the concept of garden is the place where all natural sounds and objects are harmonically arranged. Compared with Schafer's choral work, *A Garden of Bells*, in which he only focuses on the sounds of bell, Takemitsu seriously considers all possible things that might be seen and heard in the garden, including water sounds, bird songs, rainy sounds, trees, flowers, stones, and even the soil, each of which has great potentials to be transformed as different musical element. In his article, *Dream and Number*, when Takemitsu discusses the sound of orchestra, he points out that his approach to orchestra is different than that of Western composers: [85]

> The ordinary concert hall is built with the expectation that the orchestra will be blended into a single instrumental sound. I am much more interested in an orchestra that, in any given moment, can create as many different sounds as possible. For example, we can think of the orchestra as a garden, especially as a "garden for strolling," the popular Japanese landscape garden that has a variety of aspects, all in harmony without a single detail overly assertive. This is the aesthetic I wish to capture in music.

With this idea, he is able to present the multifaceted sides of the natural object in the garden by changing the colors of sound as the viewers can look at it from various angles or listen to it from different distance when they walk on the path of garden to explore . *Garden Rain* is one of examples showing that how Takemitsu utilizes the idea of distance to represent the changing nature of sonic objects in garden. This piece was composed in 1974, and, as Takemitsu noted, it

[85] Ibid., p. 86.

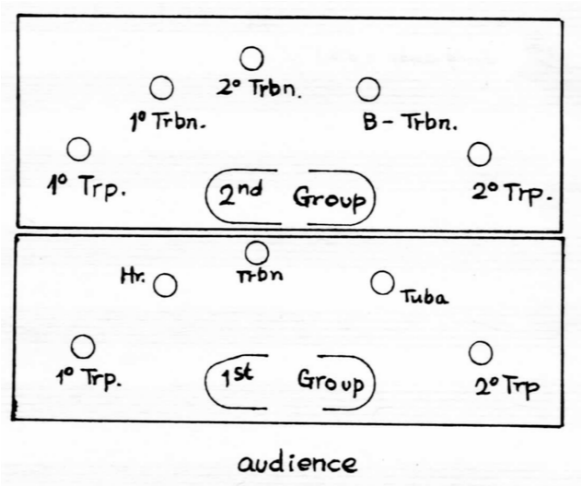
is inspired by the poem written by Susan Morrison when she was 11 years old. The poem is as follows: [86]

> "Hours are leaves of life,
> And I am their gardener…
> Each hour falls down slow."

a. The Spatial Design of *Garden Rain*

The noticeable feature in *Garden Rain* is the use of spatialization in the arrangement of two brass ensembles. The first group, which is positioned at the front of the stage, is comprised of 2 trumpets, horn, trombone and tuba, whereas the rear part of the stage is occupied by the second group in which 2 trumpets, 2 trombones, and bass trombones are used. (See Figure 1).

Figure 1

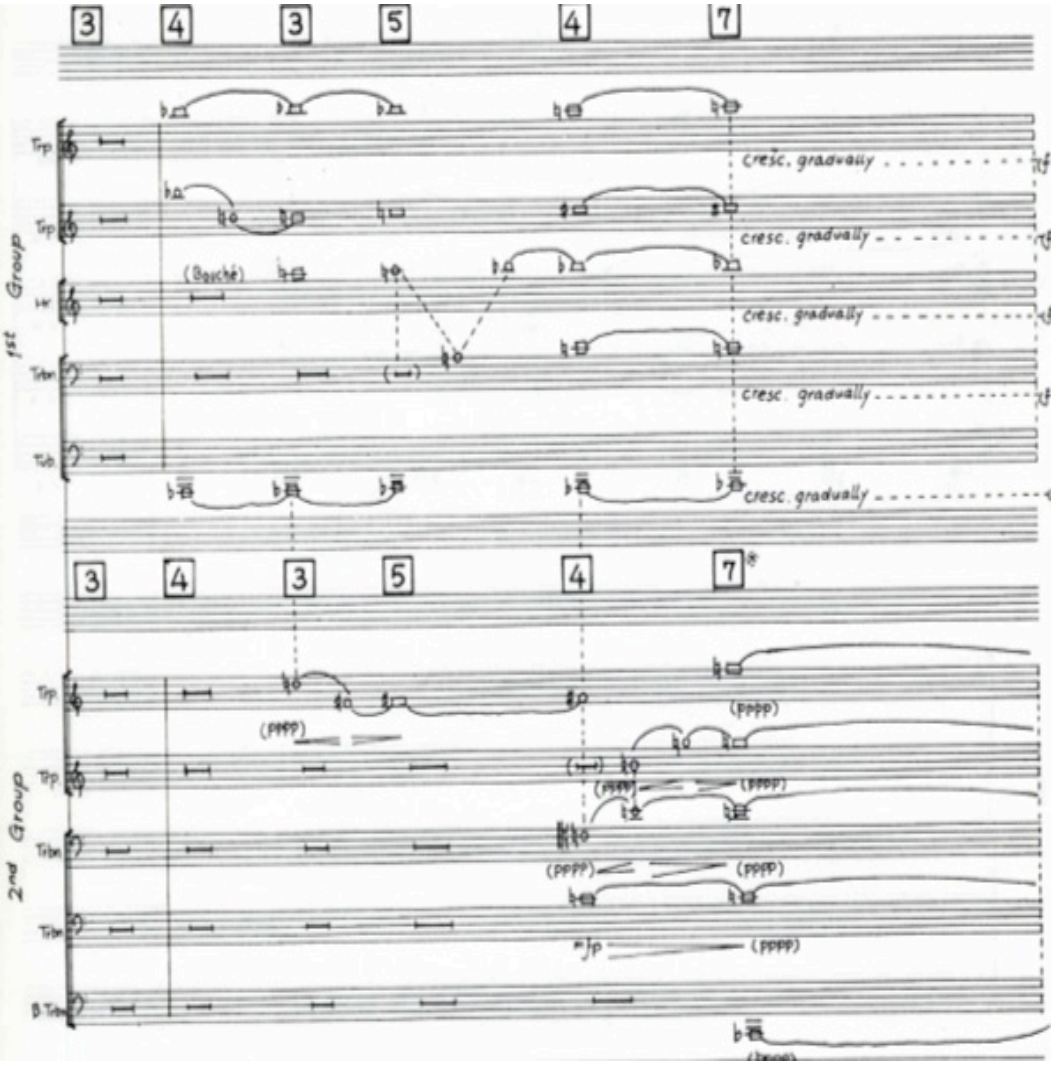


In Figure 1, this spatial design enables the audience to sense the subtle difference of the instrumental sounds from two different positions. Moreover, the flow of the sound is not limited within one instrumental group. Takemitsu tries to create the sonic interactivity by separating the melodic line to these two groups. In this way, we can trace the sonic movement from one spot to the other. For example, at the m. 16, we can find several melodic segments traveling from one

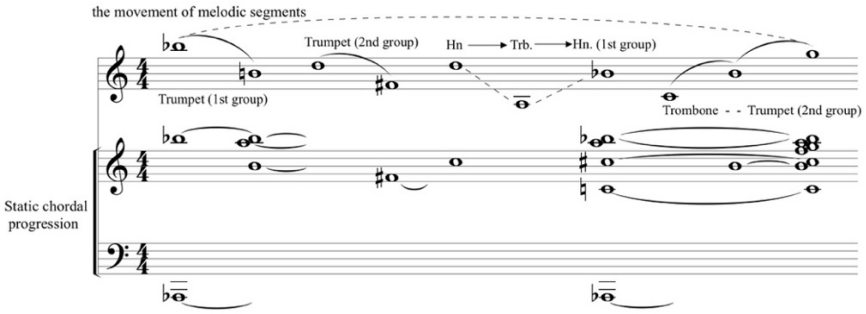
[86] Ibid., p. 101.

instrument to the other in different groups, resulting in a feeling as if we are walking in the garden to view and listen to a sonic object from different angles (See Example 1 below).

Example 1a – m. 16

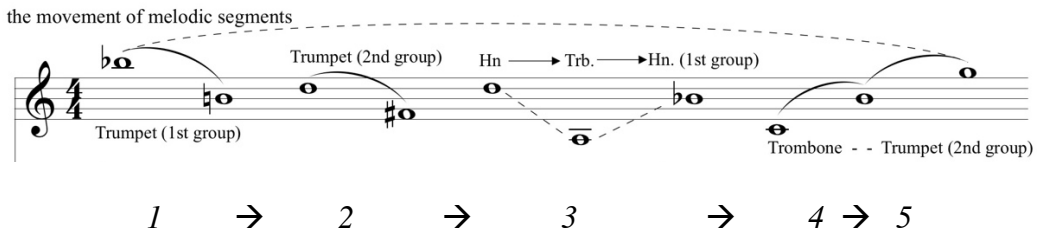


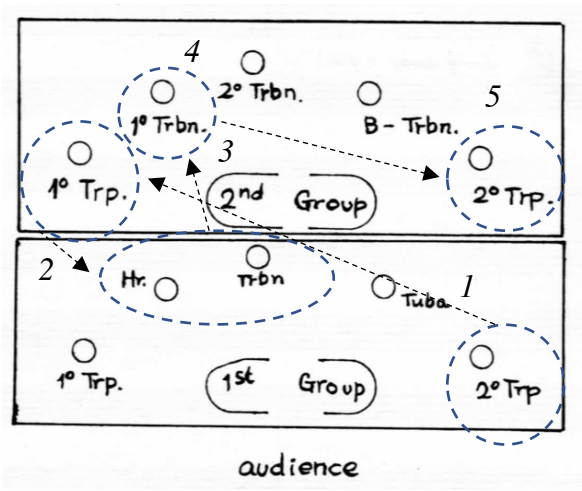
Example 1b – reduction of m. 16



Example 1b is the reduction of the above excerpt at m.16. The movement of these melodic segments are supported by the static chordal progression; these chords, on the other hand, also provide the pitch material for the above melodic segments. If we try to trace the flow of them from one instrumental group to the other, we could see a very clear trajectory moving around these two groups. In the following Example 2, I use the number, placed below the melodic segments, to indicate its corresponding instrument in the picture of the instrumental arrangement.

Example 2





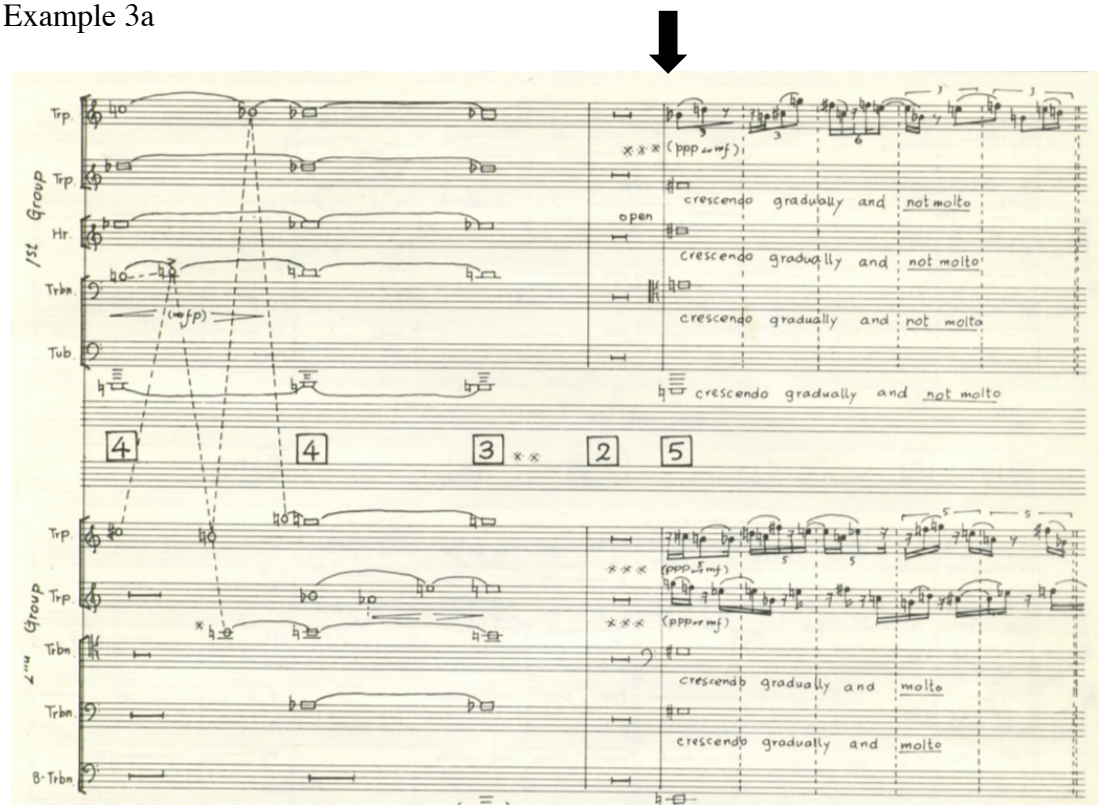
As we could see, it first initiates from the 2nd trumpet (first group) at the very front and then proceeds to the 1st trumpet (second group) of the back area. After coming back to the horn and trombone of the first group, it recedes to the 1st trombone and 2nd trumpet of the second group. In this example, Takemitsu tries to create the path of garden by establishing the flow of the sounds from a certain point to another. Interestingly, when it finally goes back to the 2nd trumpet of the second group, the sound quality is a little bit different from the original one in the front area

since the sound is delivered from the different distance. This idea might reflect Takemitsu's philosophy of nature: 'The natural sound never repeats itself.'

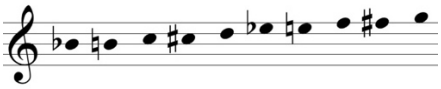
b. Pitch Material

Takemitsu's obsession with water could be observed in many different manifestations in his compositions. In *Garden Rain,* it not only represents the idea of multifaceted-side of the natural object but also the kaleidoscopic form of the rain sound. *Garden Rain* presents Takemitsu's personal reflection and observation of the rain sound. The idea of the rain is so delicately and poetically depicted that we can feel its nature of uneven quality in its color, duration, and amplitude, in this piece. Also, with this spatial design, the idea of rain sound from different distance also affects its form and texture. In this part, I want to focus on how the organization of pitch material and its incorporation with the musical texture represent the changing nature of rain. The following Example 3 shows the specific example of this idea.

Example 3a

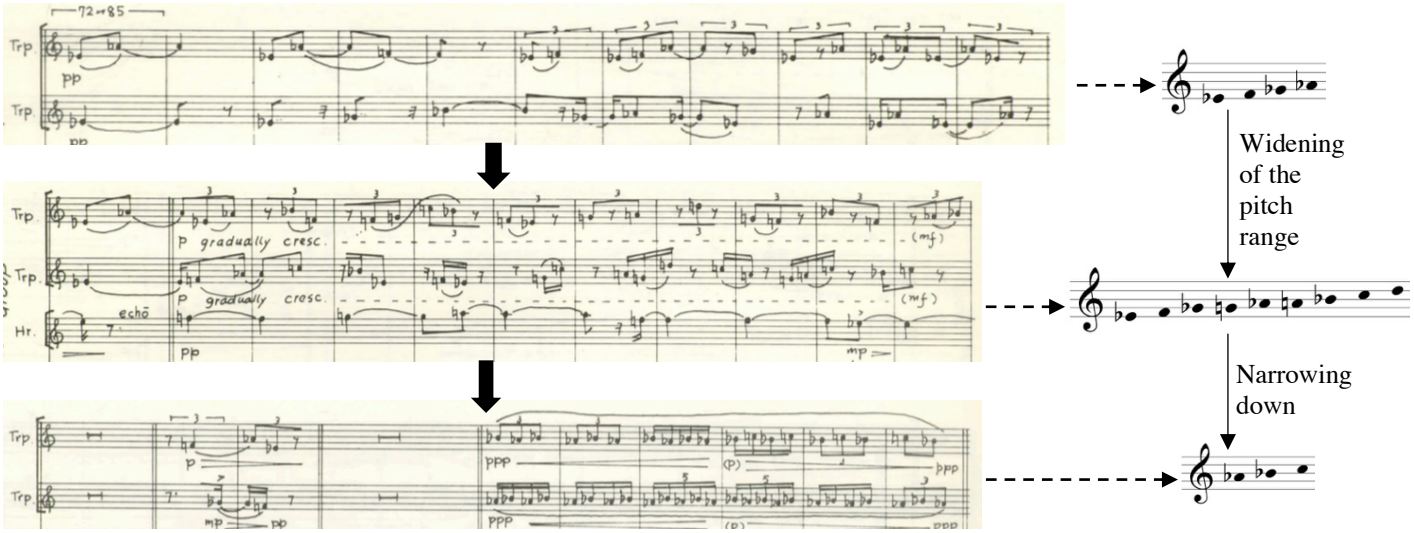


Example 3b – the use of pitches in Ex. 3a



In Example 3a, the arrow above the score indicates the starting point of rain sound. As we could see in Example 3b, the chromatic collection ranging from B*b* to G is distributed over the whole passage with complex rhythmic activity. It may reflect the idea that usually the sound of raindrops, including its dynamic, pitch, and timbre, are not regular all the time, but varies in each moment. Furthermore, we are not able to identify every single sound of raindrop, but what we perceive is the large mass made out of many isolated sonic event. Obviously, Takemitsu doesn't intend to let us listen to the detail of the pitch material but the overall transformation of the textures formed by the irregular rhythmic activities and the stream of the notes from the collection in Ex. 3b. Also, if we listen carefully, the dense of texture and volume in rain sound may be slightly changed depending on how wind blows over to this environment. Takemitsu may also recognize this interesting natural phenomenon and tries to depict this idea by varying the overall rhythmic texture and chromatic density in the following Example 4.

Example 4 – the transformation of musical textures



The process of layering the chromatic pitch material may vary the thickness and the complexity of the texture as if the sound of rain is louder when the wind is stronger, softer when the wind goes weaker.

In *Garden Rain*, Takemitsu cleverly presents his personal reflection of the environmental sound through his outstanding technique of orchestration and the control of textural variation. By introducing the concept of spatialization, the nature of environmental sound can be more vividly presented because this is the very important element that influences our perception of sound. Also, the approaches of pitch organization and its variation with the specific texture shows that how Takemitsu refines and extracts the concrete sound to find its essential beauty and expression in music. However, our realization of this approach might be always inconsistent since people may interpret this piece with different viewpoints or aspects if there is no instruction from the composer. In the following part, I will focus on Takemitsu's concrete music work, *Water Music*. The direct study and use of the concrete sound enable him to fully incorporate the most intrinsic beauty of the water sound with his musical expression.

II. Water Music

In his concrete music work, *Water Music* (1969), the representation of natural sounds is more direct and clearer than that of *Garden Rain*. In *Water Music*, some sonic materials are electronically modified and developed, such as the change of frequency, amplitude, and speed, while other sounds retain their original identities without any modification. In those sounds with a greater electronic variation, such as the fragment from 1:06 to 1:15,[87] they become not only the mere collage made of the sonic segments but the phrase that conveys a specific musical idea. Hence, the recorded material with particular technique of modification is the mode of expression

[87] Toru, Takemitsu, *Coral island: for soprano and orchestra*. *Water music: for magnetic tape*. Vocalism Ai (Love): for magnetic tape (RCA Victoria, 1969).

showing Takemitsu's creative compositional method about how the idea of water sound could musically mean to him.

In addition, some recoded sound of water drop are repeated for many times so that the identity of these sounds are gradually distorted and we may not perceive them as mere water sounds anymore, but rather as a simple sonic phenomenon. Through the process of repetition, the new identity of the sound generates, and this is also the moment that music is born. Although Takemitsu himself claimed that this work wasn't influenced by the school of Musique Concrète in France, this is indeed the typical technique that Schaeffer used to search the musical quality from the concrete sound.[88] So, this interesting parallel between these two composers from different cultural background may reveal the truth that some composers in the mid-twentieth century started to shift the focus to the exploration of the essential quality of the sound, which might be the natural reaction to the dogmatic organization of pitch, rhythm, and dynamic in the total serial music.

Takemitsu's awareness of the musical quality in natural sound could be also observed in his note about the way of listening to the environmental sound: [89]

> When one listens to a bird song in a natural circumstance, he hears other natural noises as having the same importance. In a natural environment, the noises should not hinder the act of listening. Rather, innumerable sounds help one to really listen. Establishing many auditive focal points, is one side of composing, and trying to listen to one voice in many sounds, is another side. First, devote yourself to a simple act of listening. Only then you will understand the purpose of music.

As Takemitsu notes, listening is the most powerful way to communicate with the natural sound. By exploring our sonic environment through the act of listening, we could find that the sound itself is not merely a confined object, but, when it comes to human's perception, is rather a living matter that could always be openly and endlessly developed through our imagination and

[88] Pierre Schaeffer, *In Search of a Concrete Music*, p. 13.
[89] Noriko Ohtake, *Creative Sources for the Music of Toru Takemitsu*, p. 20-21.

musical sensitivity. At this point, Takemitsu brings us to go beyond these environmental sounds, which successfully emancipates the sound from its concrete frame. In the following Figure 2, based on my own observation, I list several basic recording materials that he used and the ways of electronic variation.

Figure 2

<table>
<tr><th colspan="2">Basic materials / Variations</th><th>Frequency</th><th>Dynamic (Amplitude)</th><th>Repetition</th><th>Truncation</th></tr>
<tr><td rowspan="4">Sound of droplet</td><td>In a deep and large container (low)</td><td rowspan="7">Changing its original frequency to create a sense of pitch progression. Sometimes, the ambient noise might be also changed to increase the layers of the single sonic object.</td><td rowspan="7">Adding the dynamic variation to highlight particular parts of the sonic object. It varies the basic shape of the sonic object.</td><td rowspan="7">Repetition may also occur along frequency change and dynamic variation, resulting in a unique sonic gesture.</td><td rowspan="7">Cutting different parts of the sonic object to blur the identity of the original sound.</td></tr>
<tr><td>In wide space (high)</td></tr>
<tr><td>In narrow space (extremely high)</td></tr>
<tr><td colspan="2">Sound of diving</td></tr>
<tr><td colspan="2">Sound of Pumping</td></tr>
<tr><td colspan="2">Sound of flowing water</td></tr>
</table>

Water Music is the interesting case showing that how Takemitsu combines the natural sounds with his own compositional method based on the technique of Musique Concrète.[90] In the piece, it presents an important idea that how the composer manipulates the recording material to express his musical imagination. In his article, *A Personal Approach*,[91] he refers that the sound is a medium that composers use to communicate their spiritual sensitivity to audience. At this point, the sound is not abstract but a very concrete thing conveying vivid musical impressions. Takemitsu also argues that the sound shouldn't be only bound with conventional system or mathematic compositional process, such as twelve tone technique. It is dangerous if composers merely consider the sound as the structural function without truly experiencing its quality and

[90] In the interview "*La Semaine du Son 2010*", Schafer mentioned that Pierre Schaeffer's compositional ideas inspired him so much while he was writing *Soundscape – The Tuning of the World*: https://sound-art-text.com/post/30323944597/r-murray-shafer-talking-about-his-soundscape-work

[91] Toru Takemitsu, *Confronting Silence*, p. 72.

nature. With this idea, the revelation comes to him as follows: 'bring noise into the realm of organized music'.[92] It seems to me that this revelation is the historical necessity during the mid-twentieth century when people weren't satisfied with the conventional structure and begun to search new means to reveal more possibilities in the sound. Both Takemitsu and Schaeffer were aware of this important tendency and had developed their own ways of employing the environmental sounds in their compositions. With these interesting perspectives of environmental sound from these predecessors, I will proceed with the examination of this idea in the work of contemporary composer, John Luther Adams.

The Music of Landscape – John Luther Adams

With my growing interest in combining the environmental sound with my composition, the music of John Luther Adams (1953 -), the American composer whose works are deeply rooted in the landscape and geology, has influenced me in many different ways. The way that he employs the idea of soundscape into his compositions is remarkable and unusually beautiful. Adams spends many years living in Alaska to study and learn its environmental and geological characteristics and sounds which all become important part of his musical expression. He has describes his music as follows:[93]

> My music has been profoundly influenced by the natural world and a strong sense of place. Through sustained listening to the subtle resonances of the northern soundscape, I hope to explore the territory of sonic geography – that region between place and culture, between environment and imagination.

With his pursuit of the resonance in the landscape, Adams is led to create the concept of sonic geography. Here, I want to especially discuss the concept of resonance in Adams's compositional idea. In his literature, Adams never scientifically discusses the sonic feature of the

[92] Ibid., p. 73.
[93] http://deeplistening.org/site/content/catalogartists/a, accessed in 2019

resonance of place. Rather, he poetically and open-mindedly introduces the concept of resonance any sound that surrounds us: The place we live in resonate within us. The sounds around us – the songs of birds, the cries of animals, the rhythms of the seasons and the reverberations of the elements – all echo in the music of a place.[94] Also, Adams refers the resonance as the concept of keynote the term used by Murray Schafer to describe the sonic ground of the particular place. In soundscape studies, Schafer explains keynote as follows:[95]

> In soundscape studies, keynote sounds are those which are heard by a particular society continuously or frequently enough to form a background against which other sounds are perceived. Examples might be the sound of the sea for a maritime community or the sound of the internal combustion engine in the modern city. Often keynote sounds are not consciously perceived, but they act as conditioning agents in the perception of other sound signals. They have accordingly been likened to the ground in the figure-ground grouping of visual perception.

At this point, Adams notes that the keynote in the Northern interior is mostly comprised of silence: here, we don't hear any sound, but the beat of our heart and the flow of blood in the vessel. With his careful observation, Adams immerses himself to this silence to explore the deeper level of the soundscape. He says that: you can almost hear the reverberations of the earth stirring in sleep, the movements of the mountains, the passing of a cosmic storm – sounds so profound that you hear them not with your ears but in the oldest, darkest core of your being.

With this special experience, Adams encourages us to walk into the landscape instead of just watching it from a distance or within a frame of a painting or a photograph. As he refers, most people still tend to think of landscape as the ultimate ground of nature. The concept of landscape might limit our understanding and experience of the place. And this is not enough for us to get to know about the place. By walking into the landscape, we are able to fully experience

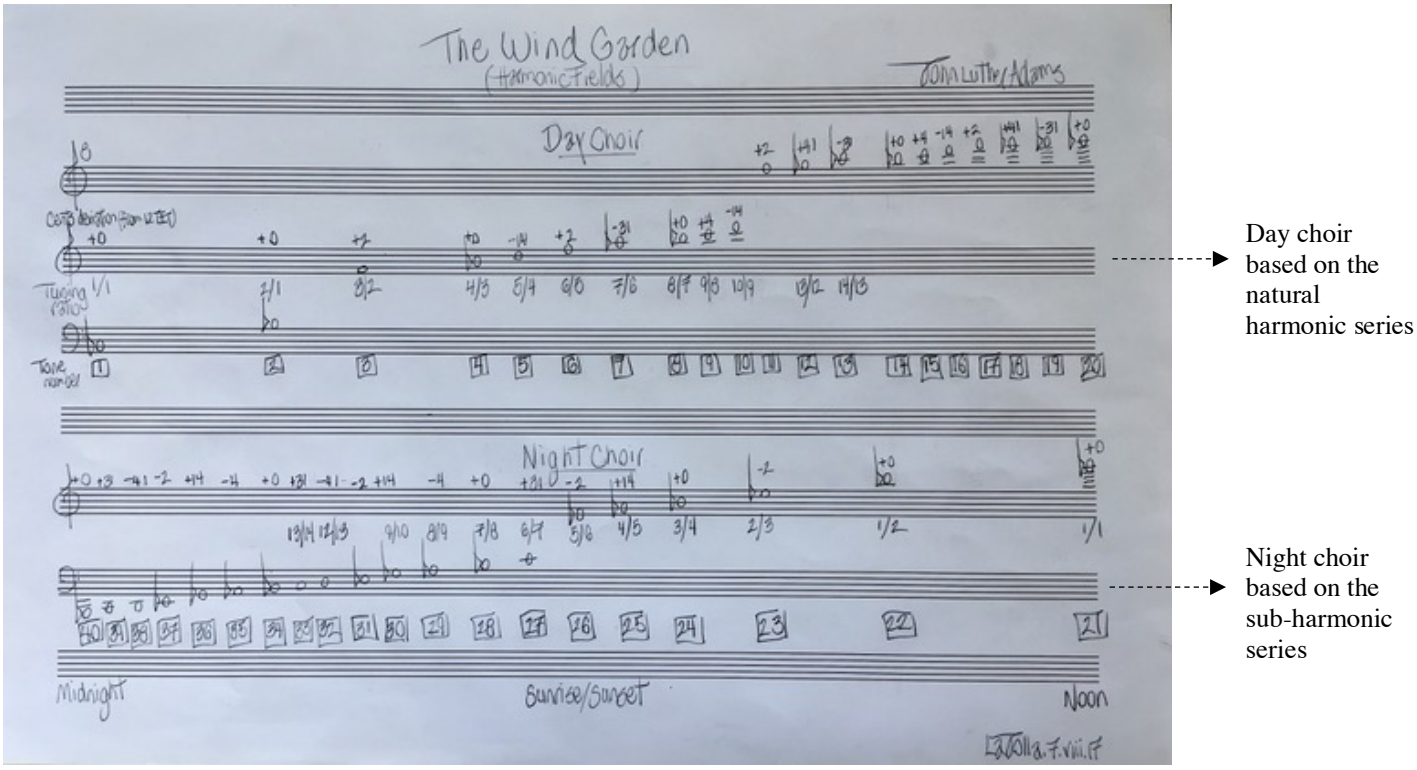
[94] John Luther Adams, Winter Music (U.S.: Wesleyan University Press, 2004). P. 7
[95] Murray Schafer, Our Sonic Environment and the Soundscape – the Tuning of the World, p. 272.

the rich diversity of sounds, which is the way that how Adams learns about the resonance of Alaska.

Interestingly, so far the composers that we mention, such as Takemitsu and Schafer who are greatly influenced by the environmental sounds, all points out the importance of immersing yourself into the given environment to feel the subtle fluctuation of the sound. Takemitsu refers that how the sound of the world penetrates him, linking his musical expression to the natural sound. Schafer, on the other hand, emphasizes the way of listening to the place carefully where you are living so that you may find so many different sonic ideas that you never notice before. At this point, Adams's sound installation work, *The Wind Garden* (2017), commissioned by the Stuart collection for the campus of the University of California, San Diego, represents the idea of sonification of the place very successfully. This work was premiered and located at the campus area of a grove of eucalyptus trees where people were invited to freely experience the sound of wind. Attached to the highest branches are 32 accelerometers that measure the movements of the trees in the wind. There are also 32 small loudspeakers setting in the forest that are connected with those accelerometers. These sensors receive the message of the velocity of the wind to generate the sound. With this idea, this work never repeats itself since the sound is always changing in accordance with the rise and fall of the wind. In this piece, there are two choirs of virtual voices that Adams designed for different time of the day. Those are day choir, which is comprised of the material from harmonic series, and night choir, which is opposite from that of harmonic series – subharmonic series.[96] The following Figure 1 shows his sketch for his design of day choir.

[96] http://stuartcollection.ucsd.edu/artist/adams.html (access in Feb. 2019)

Figure 1 – the sketch of the day choir of *The Wind Garden*



By immersing ourselves to this work for a day, we could perceive how the color of day is changed and the wind blows by listening to the subtle fluctuation of the sound. So, compared with the choral and instrumental pieces composed by Schafer and Takemitsu, this sound installation work might provide us with a more direct contact of the sound of the place. In the next part, I want to discuss how Adams incorporates the element of the soundscape with his instrumental writing to create his own sonic space where we can experience the flow of the resonance.

I. *Ilimaq* for solo percussionist and electronic sounds

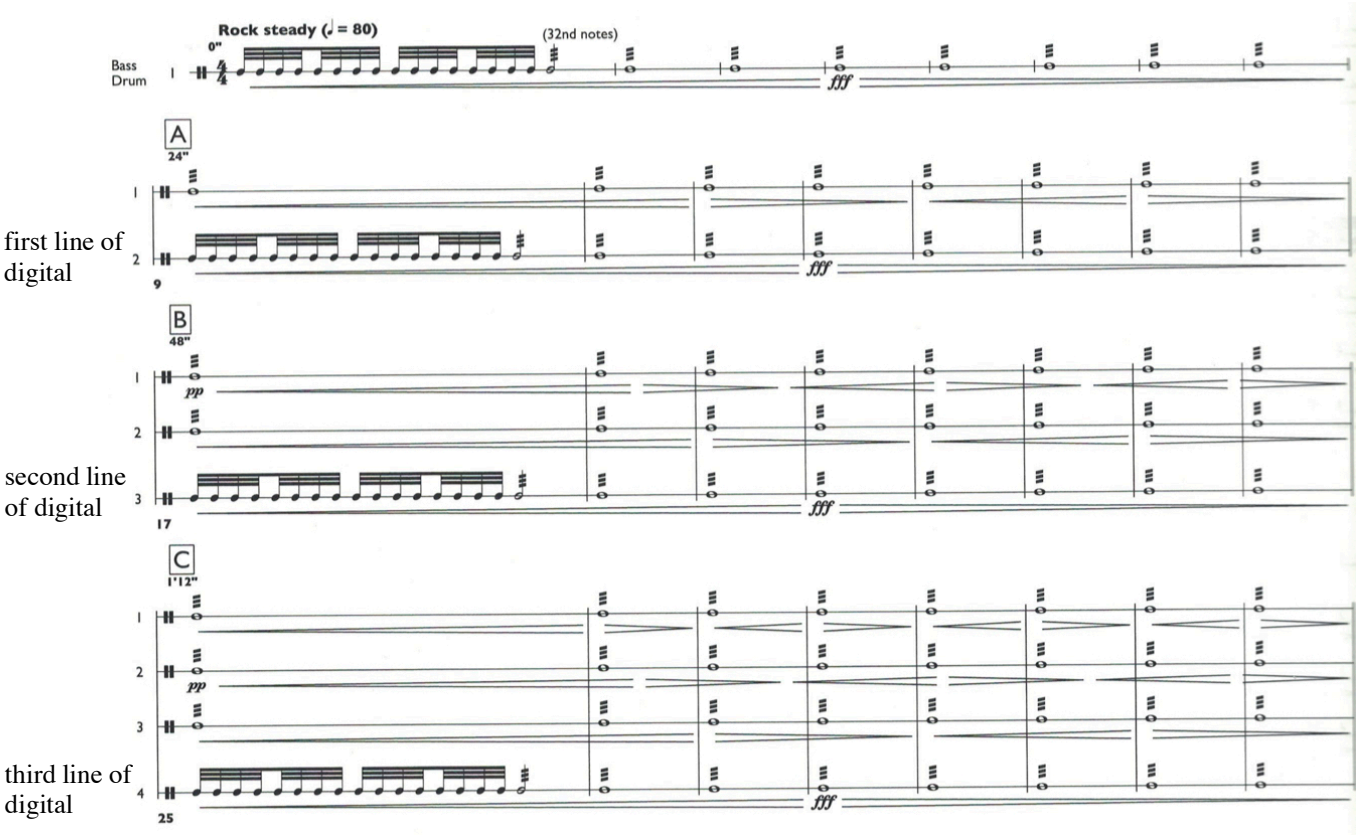
Ilimaq, composed in 2012, is commissioned by University of Texas, Stanford University, the Walker Art Center, and Duke University. The title, *Ilimaq,* might be freely translated from the native Alaskan Inipiaq language as "spirit journey".[97] In this piece, the interaction between

[97] Liner notes to *Ilimaq* by John Luther Adams (Brooklyn, New York: Cantaloupe Music, 2015)

percussionist and electronic sounds forms the texture of canon. The electronic part, which is served as the digital delay of the percussion part, is always followed the percussion part. According to Adams, this piece could also be performed by four percussionists without electronic part or one percussionist with three lines of digital delay.[98] In this configuration, the primary line of canon in each movement is extremely long that we are almost not be able to recognize the exact repetition of each line in the digital delay. However, the texture of layering caused by the delay lines may generate the beautiful phenomenon of sonic fluctuation, which is the important technique that Adams uses to model different characteristics of ambient noises, or the keynote referred by Schafer. Throughout the whole piece, we can almost hear many different kinds of sonic fluctuation in each movement. For example, in the first movement, *Descent*, all rhythmic materials he uses are almost based on the technique of tremolo with different lengths of dynamic fluctuation, variation of the speed of rolling, and the different position of accents. So, there is only one way of playing the bass drum in the first movement. The following Example 1 shows the beginning part of the canonic texture in which each voice is entering with steady pace.

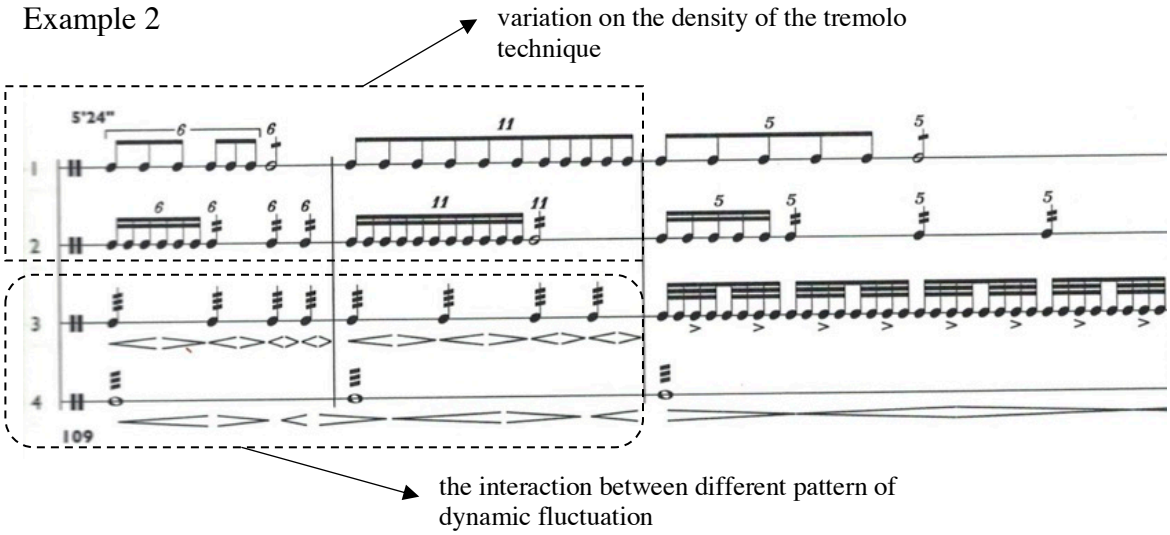
[98] Performance note of *Ilimaq*.

Example 1



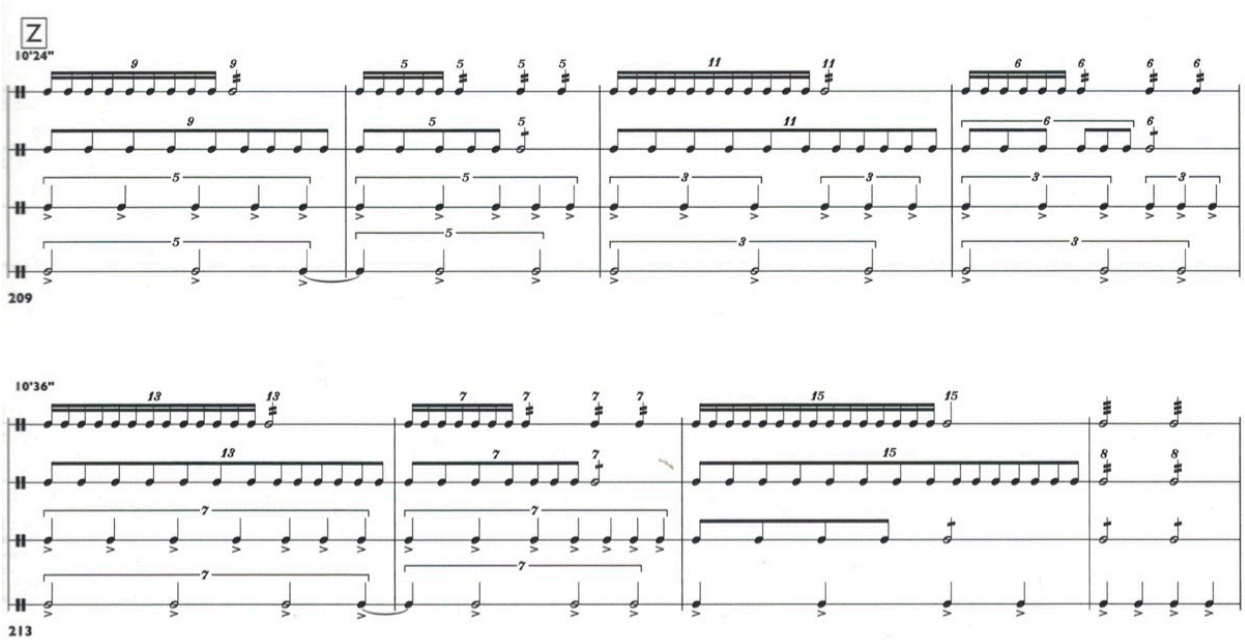
Unlike the traditional canonic texture, in which the stack of intervals from each voice forms the continuous tension while the theme is progressing, the tension of each line in *Descent* is based on the dynamic fluctuation and the variation of the density in the technique of tremolo (See Example 2 below). In my observation, Adams uses this musical texture to clearly capture the slow flowing quality of the sound of resonance in a wide and spacious space.

Example 2



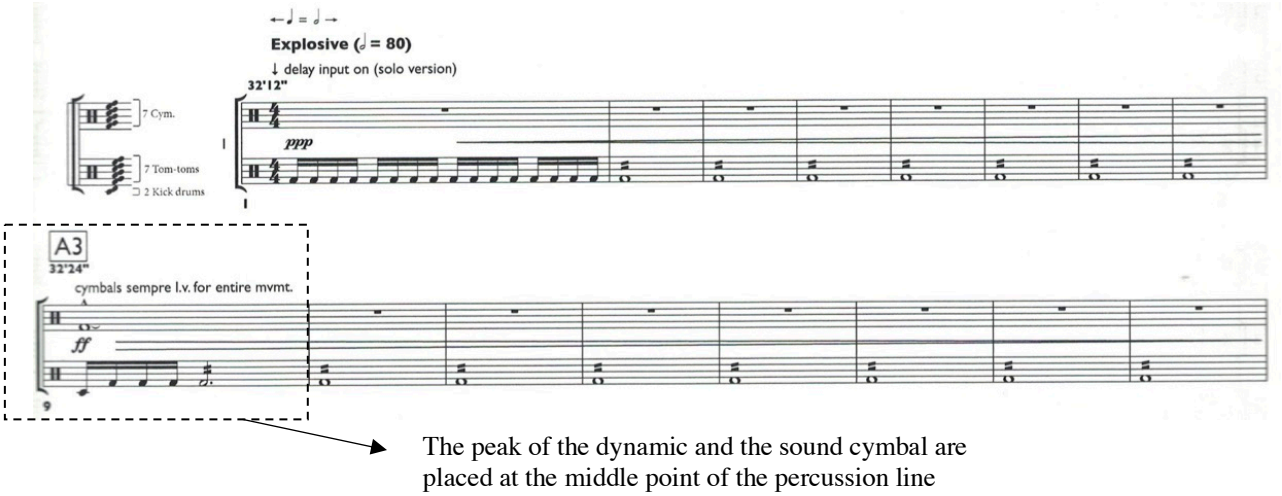
Also, the overall development of the density of musical texture might reflect our experience of listening to the soundscape. In my personal experience, when I first enter into the quiet space and listen to its soundscape, the sound of keynote always dominates my aural experience. By staying there longer, my ear is able to capture softer noises than the keynote, such as the sound of animals or leaves, that are interwoven together to form the sound mass. That is because the longer we immerse ourselves in a soundscape, the more sensitive our ear can perceive more sounds. At this point, we will amazingly find that such quiet space might have a very complicated texture of noise. In *Descent*, the percussionist starts with only one speed of tremolo. When all voices enter, the density of the rolling begins to vary until the moment that we could even recognize each attack of the individual voice (See Example 3 below). The idea of slowing down the speed of tremolo to highlight the timbre of each attack might be the way that the composer uses to represent our experience of discovery of the detail of the noise in a particular place when we deeply listen it for a long time.

Example 3



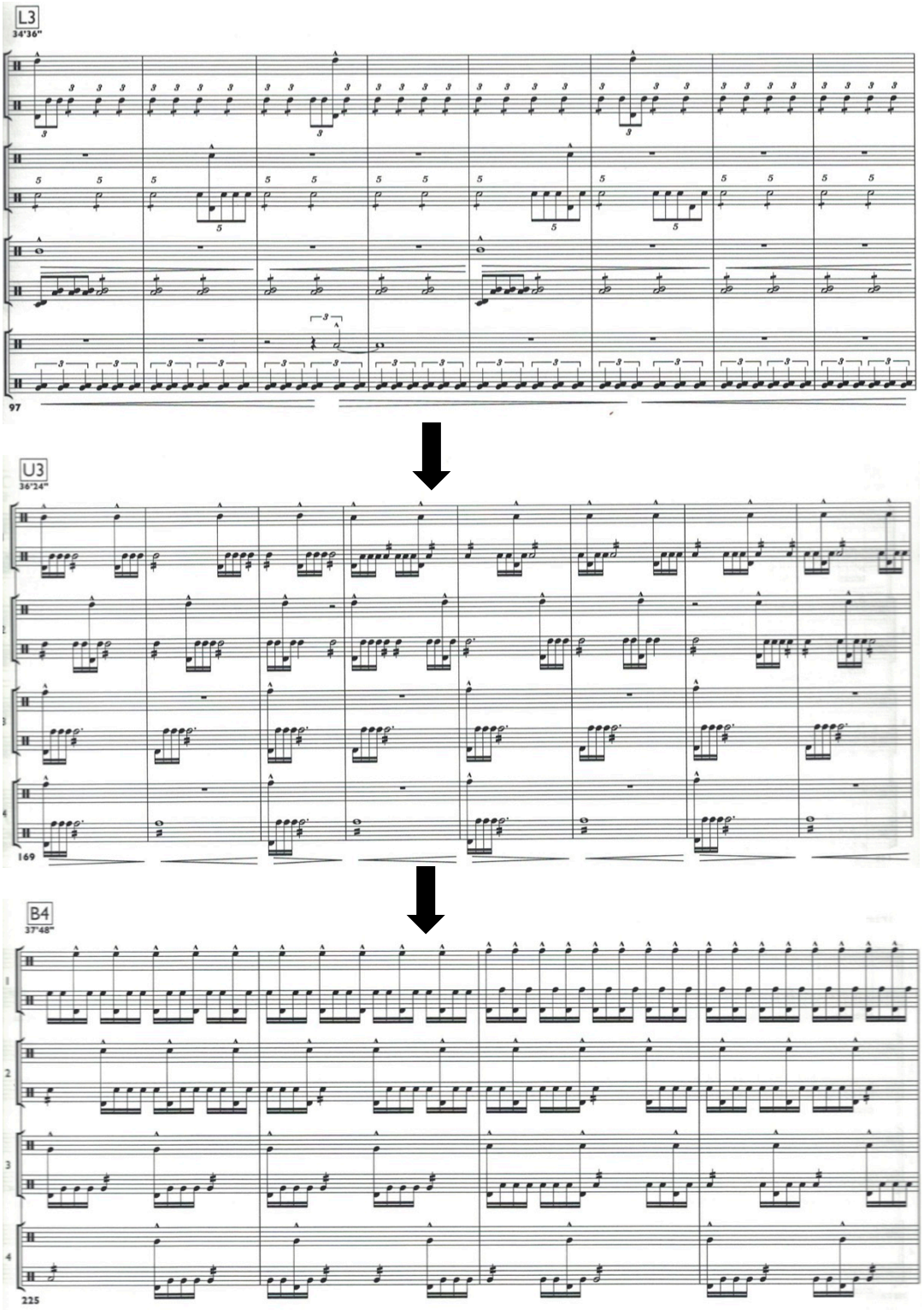
The electronic part in this piece is not just the digital delay of the percussion part. Adams also uses the recording of soundscape in each movement to enhance the connection between the sound of percussion and the environment which he aims to incorporate with. For example, the aggressive noises of wind and thunder are used in the third movement, *Untune the Sky*, to accompany with seven tom-toms and seven cymbals. With this idea, the timbre of the cymbal is clearly connected with the sound of thunder, while the tom-toms is used to interact with the noise of wind. In this movement, the use of two different instrumental timbre, metallic and membrane, forms a very interesting interaction throughout the whole piece. In the following Example 4, we could see that the beginning line of percussion part is also based on the technique of tremolo of the tom-toms, while the cymbal is only used to give the strong accent at the middle point of the whole line.

Example 4



As we could see in the Example 4, the beginning line of the percussion part is comprised of eighteen measures. The dynamic is increasing to the peak when it moves towards the middle point where the cymbal is used at the first time. With the continuous development of the percussion line, we could hear that the rate of cymbal sound is getting denser until it overtakes the speed of the rolling of tom-toms. At this point, the sound of cymbal becomes part of the overall streams of the sound and is mingled with the sound of tom-toms. The following Example 5 shows the overall development of the texture in *Untune the Sky*.

Example 5 – the growing density of the rate of cymbal sound



The most important characteristic in his works is the development of the simplicity that how Adams unfolds the basic musical idea to form the complicated texture. In this way, Adams is able to establish a clear musical trajectory that allows his audience to easily follow his soundscape in the musical time. In *Ilimaq*, the recording of the sound doesn't intend to make us think of the soundscape in the specific place. Rather, Adams might model our experience of listening and the formation of the natural noises to create his own soundscape. As he writes: I want to create a musical landscape with an essential coherence in some way equivalent to the wholeness of a real place; music that conveys its own inherently musical sense of place.[99]

The study of these composers in this topic reveals how the notion of environmental sound was cultivated and utilized in creative ways. Though those works I have been working on are based on the very different compositional approaches, with the study of their writings, the starting point for them to compose with natural elements is always the simple act of listening. This is the most direct way to explore the possibilities of our sonic environment.

[99] John Luther Adams, Winter Music, p. 15.

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Response to Question III

The concept of heterophony, which was first used and coined by Carl Stumpf, is usually recognized as a musical texture in which a degree of improvisation is presented by different parts of the ensemble. Heterophony is also an iconic feature of musical texture in Asian music or the folk music of the Western world and defined by Peter Cooke as the simultaneous variation of a single melody in Grove dictionary. The similar definition could be found in the book of William Malm: music in which the different parts are performing the same tune at the same time, but each part is making its own melodic or rhythmic variants of it. (1996)

On the other hand, an influential German ethnomusicologist, Curt Sachs, has open-mindedly discussed the possible definition of heterophony and suggested that: the concept of heterophony should extensively cover all possible types of otherness in voice cooperation, between the opposite extremes of unison and of invertible counterpoint. (1962) With these ideas, we can observe that the general concept of heterophony seems to be comprised of simultaneous variation, improvisation, and embellishment of a single melody. However, if we direct our attention to the formation of this improvisation or the relationship among the parts in the traditional ensemble, we may surprisingly find that the texture of heterophony might be formed and shaped by other important elements, including lyrics, pitch vocabulary of instruments, timbre, and spatial arrangement which haven't been elaborated quite extensively by the scholars.

In this topic, I'm interested in exploring the inner impetus of heterophony by starting with the analysis of the Asian traditional ensemble music, Taiwanese Nanguan, to see how the instrumentalists and vocalists interact and embellish the main melody in heterophonic way. The purpose of this study is to reveal the idea that the language plays a significant role in shaping the texture of heterophony. So, with this idea, I will first briefly talk about the relationship between the tradition of singing and language in China by introducing some important Chinese ancient

treatises about the singing and phonology. Also, I will examine some musical examples about how the text and melody are merged together in the process of musical making. In this part, we could see how the tonal inflection of the text may influence the formation of the melody. With this as our foundation, I will proceed to the core of the study of Taiwanese Nanguan music. In the tradition, most melodies or songs in Nanguan music are derived from the mainland China. And the text that Nanguan performer uses is the Chinese dialect, Minnan. So, in the process of teaching and musical making in Nanguan, these melodies are varied and transformed by the Nangaun performers in order to fit the Minnan dialect into the frame of this melody. If we try to compare two different Nanguan pieces that are all based on the same melody, it would be clear to see that how the melody itself is flexible to be varied, changed, and transformed to fit with different contexts of lyric. This is the concept of heterophony occurring at the point that the same melody could be developed into two similar versions when it is employed by two different languages or dialects. Also, in the Nanguan ensemble, the various tonal inflections and vocal gestures in Minnan dialect may affect the way that how vocalist embellishes the core melody of the whole ensemble. In the last part of this section, I will be focusing on the analysis of the relationship between the text and the melody of vocal part, and to examine the heterophonic interaction between the vocal part and the instrumental part. Hence, with this study, it reveals that the "free improvisation" isn't actually enough to explain term, heterophony in the music of Nanguan. Rather, one has to first investigate the nuances of Minnan dialect and Chinese so as to understand how the tonal inflection is transformed into the melodic line.

Secondly, I want to focus on the analysis of contemporary composer's works regarding their use of heterophony to explore how this idea could be further cultivated and developed in different ways. This section will be focusing on the works of Giacinto Scelsi to reveal the heterophonic texture in his one-note compositional technique. Finally, I would like to discuss

how I have synthesized these elements both from the music of Asian culture and the Western composer to create the heterophonic texture in my music. In this part, I will briefly talk about the idea of utilizing the singing technique of Nangaun to the English text in my work, *Rising Vision*. The important idea in this piece is about that I use the timbre of the consonant and vowel to shape the depth of the musical note of the vocal part. And this is the primary element that my heterophonic texture is based on.

Language and Music

I. The Earliest Treatise about the Language and Music

The records of singing tradition in China could be dated back to the very early time, Shang dynasty, 1600-1046 BCE, when the earliest form of the written language was found on oracle bone scripts. People from that period of time or even earlier might have known how to use the language or syllable to express meaning and emotion through the incorporation with music.[100] Although there is no record of the concrete system of musical notation to allow us to investigate the relationship between language and music, scholars can still learn other facts of music, such as the form of music, through the content of poems composed by literati, emperor, and folk. *Book of Odes* (Shijing, 詩經), comprising 305 works dating from the 11th to 7th centuries BC, is the earliest existing collection of Chinese poetry compiled by Confucius (551-479 BCE). According to Yang, Yin-liu (1899-1984), the Chinese ethnomusicology, *Book of Odes* contains a wide variety of styles including the fifteen states of China, which also reflects the real life of people during that time. Until now, its rich content is still an important primary source for scholars to study the historical culture of China. However, although some poems of this collection are designed for singing, I have not been able to find the documentation of musical source that can prove how singers interpreted these poems in terms of the tonal inflection of the words. But we

[100] Yang, Yin-Liu, Chinese Musical History

could still find some words about the relationship between language and music by looking at the introduction of *Book of Odes*: If language is not enough to express our feeling, we breathe a sigh; if sighing is not enough to express our feeling, we sing; if singing is not enough, then we dance.[101]

With the development of singing techniques and musical notation, musicians began to systematically study the theory of phonology and how they could fill the text into music in terms of the sonic quality of the word. The important treatise focused on the phonology and singing technique is *Phonology of Chong-Yuan* (中原音韻) finished by Chou, De-ching (1277-1365) in 1324 AC during Yuan dynasty (1271-1368). It provides the concrete sources about how the Chinese musicians could sing the melody in accordance with the sonic quality of phonology of the texts. This book also has the significant contribution to the research of Chinese phonology. Chou focused on the phonology of Chong-Yuan area, which was the living language used by people during Yuan dynasty in the North of China, as the standard to investigate its consonant, vowels, and tonal inflection and then establish a concrete system. The second part of this book, *Orthoepy and Writing Lyrics* (正語作詞起例), is especially focusing on the correct choice of the word to fill with the singing melody. Chou provides "ten methods of writing the text"(作詞十法) in this part to suggest that how musicians should fill the text in the melody in terms of the sonic quality, structure, context, and tonal inflection of the language. I try to translate these methods and list them as follows: [102]

1. Knowing about the pattern of rhyme (知韻)
2. How to make the sentence (造語)
3. The meaning of the sentence (用事)
4. Choice of the Word (用字)
5. To be careful while entering the melody with the flat tone (入聲做平聲)
6. Ying and Yang (陰陽)
7. The most important word or sentence in the whole drama (務頭)
8. Antithesis (對偶)
9. Ending Sentence of the piece (末句)
10. The Prototype (定格)

[101] I freely translate and paraphrase the text. The original text is as follows: "言之不足，故嗟嘆之；嗟嘆之不足，故詠歌之；詠歌之不足，不知手之舞之，足之蹈之"

[102] These ten methods are summarized by Yang, Yin-Liu in his Chinese Musical History, p. 282.

However, as Yang critics, when Chou listed these ten methods, he considered too much about the form and the sound of the language and ignored the content of music, which might cause his work as the one-sided research.[103] In this part, I won't argue and discuss the value of this book.

II. Vocal Line in Heterophony

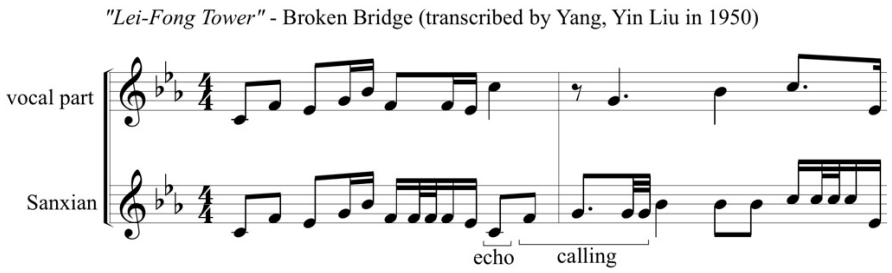
Since the vocal part is closely tied with the tonal inflection of language, the ebb and flow of melodic lines might be formed with the features of different dialects of the Chinese language. In the tradition of Chinese ensemble, the vocal line sometimes dominates the overall melodic progression, which provides the core melodic line on which other instruments are based to decorate and embellish.[104] Sometimes, all the members in the ensemble read the same score. Following the guidance of vocal line, the instrumental part not only merely decorates the core melody but also supports the vocal part with its particular pitch vocabulary and timbral characteristics in order to achieve the harmonious incorporation and the balance of texture. Unfortunately, compared with the theory of singing technique and phonology, the tradition of instrumental accompaniment is rarely discussed in the books. Some scholars still try to summarize the techniques of accompaniment through directly studying from those performers who have rich experience in performance. In *Chinese Musical History*, Yang lists several salient features regarding the Sanxian (three-string fiddle) techniques of accompaniment that he learned from Ching-Chang club, the ensemble which was active for a long time. Interestingly, most accompaniment techniques listed by Yang could be considered as part of heterophonic features, which enable us to examine how this heterophonic texture could be explained not merely through the concept of free improvisation, but through the technical perspectives that Yang learned from

[103] Yang, Yin-Liu, Chinese Musical History, p. 282.
[104] Robert T. Mok, Heterophony in Chinese Folk Music, *Journal of the International Folk Music Concil*, Vol. 18 (1966).

those performers. In the following, I provide five techniques that are highly relative to the idea of heterophony that Yang summarizes (The following Examples are extracted from the piece, *Lei-Fong* Tower of Southern Music Drama of Song Dynasty): [105]

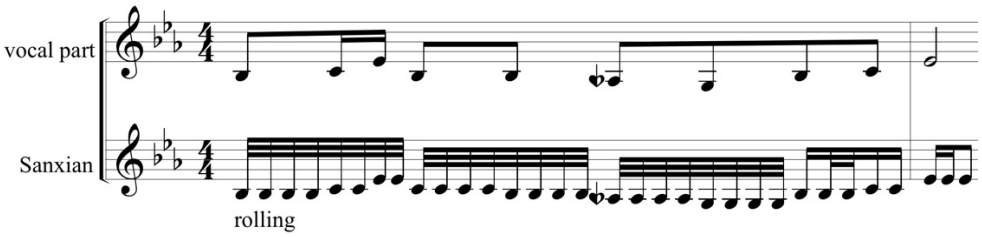
1. Echo (應弦) – Using Sanxian to play the vocal line with octave and fifth lower in order to respond to and support the vocal part (See the following Example 1).
2. Calling (喚頭) – When a musical sentence is at the ending point, the Sanxian may additionally add two to three notes in order to provide the ending signal. Sometimes, it may include the note in the next beginning part of the vocal line. The vocalist could take this point as reference to prepare the next musical sentence in advance.

   Example 1



3. Rolling (滾頭) – Playing eight notes in a beat as the technique of tremolo in order to enhance the musical tension and excitement of the vocal part.

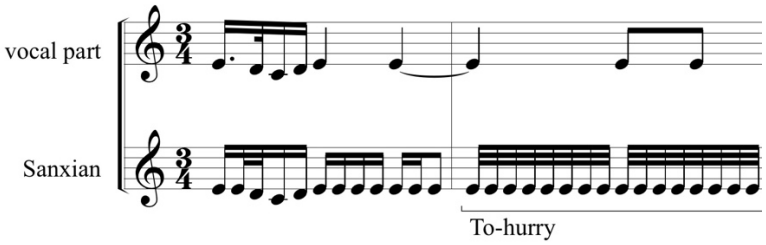
   Example 2



[105] Yang, Yin-Liu, Chinese Musical History, p. 162.

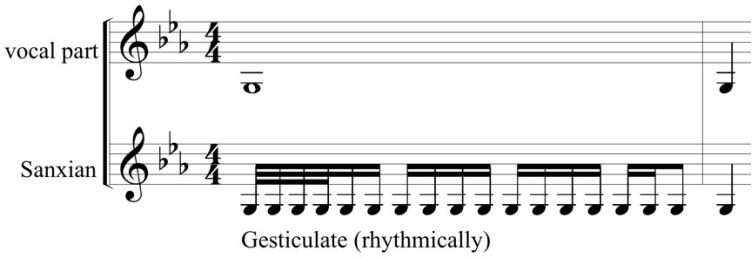
4. To-hurry (催頭) – Before the Rolling part, the Sanxian plays a particular rhythmic figure,  , to prepare for the next exciting part. The effect is like that someone is trying to hurry others to do something.

   Example 3



5. Gesticulate (做頭) – Usually, this technique could be presented in many different ways. It is used for supporting the vocal part in order to increase the overall dramatic effect. So, the Sanxian may use a particular melodic figure or rhythmic figure to represent what vocalist and character act and sing.

   Example 4



As we could see, the heterophonic texture results from this intricate interaction between accompaniment and vocalist, and the technique of accompaniment has a lot to do with the dramatic elements of the music and the context of the drama. The so-called “simultaneous

variation"[106] is just the superficial description about this texture. There are actually lots of serious consideration about how the instrumentalists could incorporate with and support the vocalist. As Yang points out, the technique of accompaniment has a long tradition. Its technique might be adjusted to the evolution of singing style and phonology.[107] On the other hand, in Sheng, Chung-Sui's book, *Essential of Making Music* (1639), in addition to the dramatic elements and other practical concerns, he discusses that the instrumentalists have to mind the tonal inflection of the text so as to provide the perfect accompaniment to accurately respond to the subtle variation of the vocal line. I translate one of the paragraphs from Shen as follows:

> Different singing styles usually convey different characteristics. When instrumentalists accompany with a given style, they should know the features of this singing style. Some singing styles tend to be passionate and intense, so their instrumental accompaniment should try to subdue the volume or complexity to make the vocal part stands out. On the other hand, some singing styles are usually for the emotion of sadness and loneliness, then the instrumental accompaniment could arise the register of melody to echo with the vocal part. Moreover, the instrumentalist should carefully follow the structure of word (lyric) and try to fit with word's consonant and vowel so that everything could be perfectly harmonized.[108]

On the other hand, if the singer couldn't articulate the word correctly, it causes the problem for the instrumentalists. The following discussion provides a clear argument about the importance of tonal inflection. This paragraph is also translated by myself as follows:

> When one sings the fourth tone words, such as the words, Tsue and Shih, with the melody in the high register, he/she should reach the pitch directly and straightforwardly without hesitation. If the high pitch drifts around or falls down immediately, it may make instrumentalists feel difficult to follow because they are not sure which tone of words you sing. Likewise, when one sings the first tone words, one couldn't freely change the

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[106] Yang, Yin-Liu, *Chinese Music History,* p. 162-176.
[107] Ibid., p. 161.
[108] Original context: 如『羅江怨』,『山坡羊』等曲,被之蓁，箏，渾不似即今之琥珀詞諸器者，彼俗尚存一二，其悲淒慨慕，調近於商，惆悵雄激，調近正宮，抑且絲揚則肉乃低應，調揭則彈音愈渺，全是子母聲巧相鳴和。

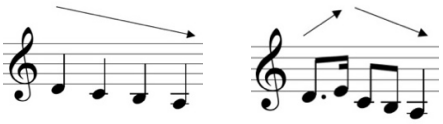
contour of melody (although the first tone word could be sung in either high or low register). Otherwise, you wouldn't fit with the instrumental accompaniment perfectly.[109]

The dialogue between the vocal part and the accompaniment is delineated through the meticulous treatment of the dramatic elements of music and the concrete rules of phonology. With this idea, Yang also tries to list a series of rules about writing the melody to fit with the text in Southern Music Drama. In this table, Yang suggests that the composer has to carefully write the melody in accordance with the nature of the tonal inflection of the word. For instance, the word with the fourth tone, which is the heaviest tone in Chinese language, has to be sung with the descending melodic line or with the melodic curve line of the slightly ascending and a strong descending motion. In the tonal inflection of Chinese language, there are four different tones, which I briefly summarize as follows with the shape of arrow to indicate the contour of sonic shape:

First tone (a level)	**Second tone** (rising pitch)	**Third tone** (the gesture of falling and rising)	**Fourth tone** (falling, starting the syllable at a neutral pitch then go downwards quickly)
→	↗	⌣	↘

In this way, the falling melodic figure is able to best represent the accent of the fourth tone in Chinese language. The following musical example is created by Yang himself.[110]

Example 5



[109] Original context: 陰去如翠、世等字，遇唱高調，須用送音直揭。若字端邪撇，聳上而仍滑下，則其音閃在半調中間，使操管弦者，上下徽孔，兩湊不著…至陽平之「拿」，則又字端邪撇，蕩下而後轉高，亦在半調中間，總不入簫管。

[110] Yang, Yin-Liu, Chinese Music History, p. 142

The practice of tonal inflection is extremely important and strict in the Chinese singing technique. And with the close interaction between vocal part and instrumental part, this text may influence or limit how the instrumental part should accompany with the vocal part. So, the heterophonic texture in this traditional music is not always based on the so-called "free" improvisation as the rule and theory of language and singing technique are very strict and concrete. In the next part, let us examine the importance of Minnan dialect in Taiwanese Nangaun music to reveal how the heterophonic texture is formed.

Heterophony in Taiwanese Nanguan

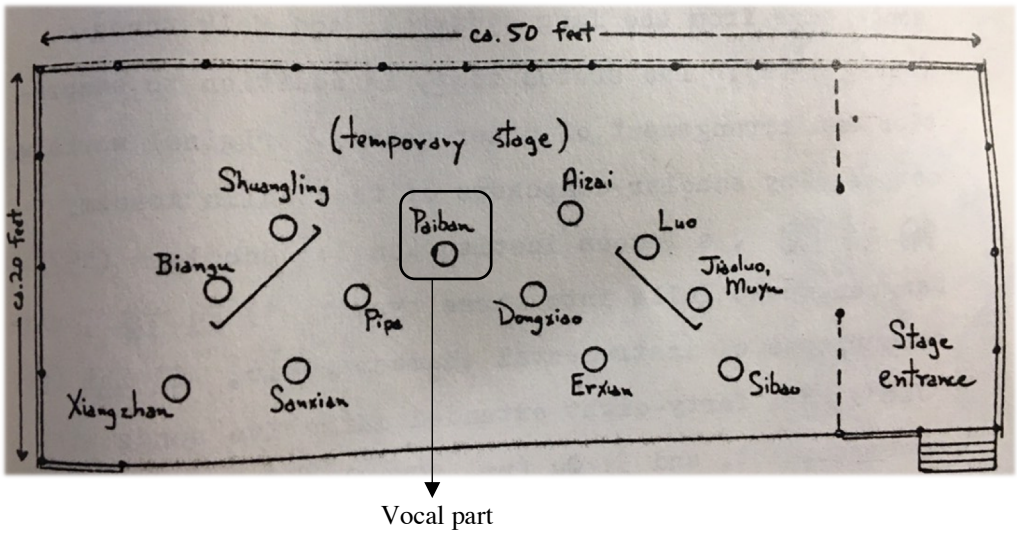
I. Nanguan Music – form and musical language

The standard ensemble of Nanguan is basically comprised of ten performers. Sometimes, the number of performers could freely change to fit for different types of ceremonies. There are five performers that are usually served as the fixed members of Nanguan ensemble: pipa, bamboo flute, vocalist, three-strings plucked instrument, two-string bowed fiddle, and percussion. As Chui-Kuan, Lu (1952-), the Nanguan researcher, states in his book, *Music from the Long Distance*, the music of Nanguan was migrated from the Yellow River area of China after the third century. The tradition may date back to the Tang dynasty (618-907) or earlier, being as one of the oldest music in China. In Taiwan, Nanguan is usually recognized as the highest form of musical expression, which is always held and supported by some Taiwanese in the upper class. With their financial support and preservation, the Nanguan performers are able to gather together to form a club where the elder performers regularly train and teach the students and followers of the younger generation.

The instruments of Nanguan are arranged by a hierarchical structure. Usually, pipa plays a leading role in the ensemble, providing the core melody which serves as the skeleton line of the overall melodic progression. The three-strings plucked instrument plays almost the same as pipa

at the octave lower in order to enhance and rich the thickness and color of the core melody. The clear attack quality of the sounds in these two instruments provides a strong and clear indication of the pitch progression so that other performers are able to follow them. Vocalist, bamboo flute, and two-string bowed fiddle, on the other hand, play the parts that embellish the core melody, which is usually thought of as the flesh of the ensemble. With these pitched instruments as the main body of Nanguan, the percussion instruments, including gong, wood block, double bells, and flat drum, are used to provide the beat to articulate the pattern of phrasing. The spatial arrangement of the instruments and vocal part is shown as the following Figure 1. [111]

Figure 1

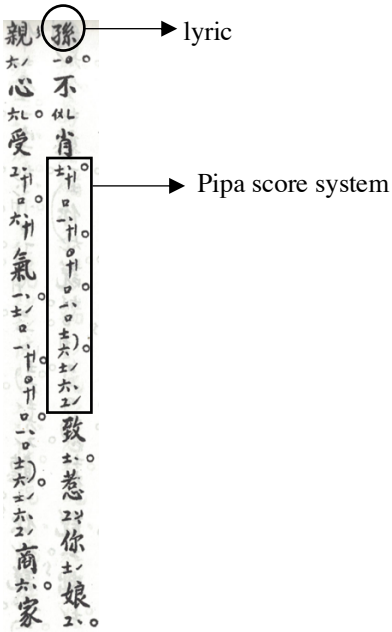


Basically, Nanguan music is categorized as three types: 1) *Pu*, instrumental chamber music without a vocalist, 2) *Jih*, the narrative song with instrumental accompaniment, 3) *Chu*, the shorter lyric song with instrumental accompaniment. So, if the vocal part is added, forming the types of performance *Jih* and *Chu*, the vocalist plays the most important role in the ensemble and dominates the overall tempo of the musical piece. At this point, the pipa is more like the

[111] Thrasher, Alan Robert, *Foundations of Chinese Music*, p. 140.

leader in the background that governs the movement of melodic progression, while the vocalist serves to provide foreground part to articulate and embellish the core melody and to acknowledge other performers about how to follow the musical emotions of the lyric. According to Chui-Kuan, Lu, all performers in Nanguan ensemble only read the tablature score of pipa, in which the score is written as the form of gongche notation.[112] The lyric is written along with the pipa score vertically to inform performers the arrangement between the text and the music (In Figure 2, the larger character indicates lyric; the smaller character indicates pipa notation). [113]

Figure 2



II. Singing in Nanguan

The language used in Nanguan music is Minnan, a dialect of Chinese language. Language plays a decisive role in shaping the melodic line of the vocal part. According to Lin Po-Ji, most melodies used in Nanguan music are actually originated and inherited from mainland

[112] Lu, Chui Kua, Music from the Long Distance, p. 300.
[113] Ibid, p. 126.

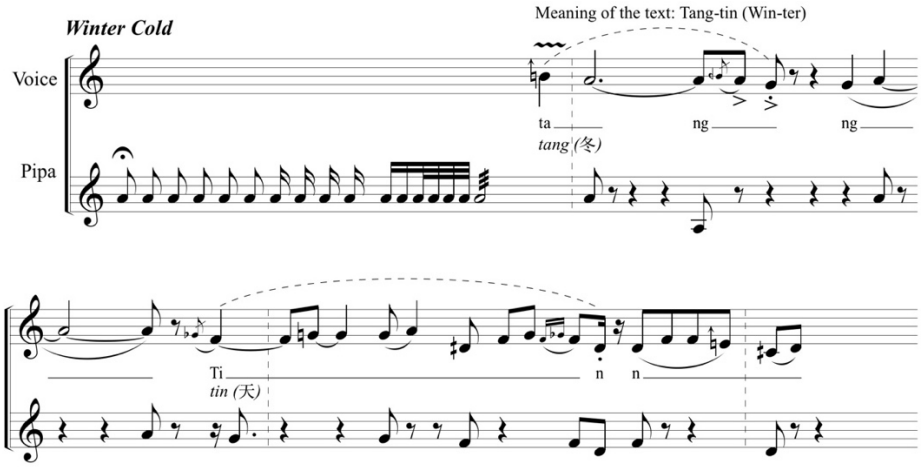
China. Its original melodic form might once be very popular and well-known in the past.[114] In tradition, this original melody is usually referred as Qupai which literally means "named tune." The concept of Qupai are very commonly used in Asian music. The musicians can choose one of them and fill it with new text to become the new piece. Throughout the long history of Qupai, some might be originally sung with a particular dialect from different area of China. In addition, one single Qupai could be reused for many different dialects so sometimes we can hear different versions of the original one, each of which might be slightly different from others. As Yang points out, in Qupai, its rhythm, mode, register, and even the melodic shape could all be varied, which has a very strong flexibility for musicians to recreate the new context. Qupai is like the seed that allows us to cultivate to become the new work based on our own need of the musical context or dramatic element. The changing nature of Qupai plays a very important role in the making of Chinese music, and this is the reason why so many of them can still be preserved until today.

When Qupai were introduced to Nangaun music, musicians filled the new text in these melodies with Minnan dialect to create the new piece. In this process, the details of the melody have to be modified and changed in order to make the Minnan text and its new dramatic element to fit with the melody properly.[115] Hence, the result might be very different from the original Qupai that I couldn't even find the common elements between the original Qupai and the Nanguan melody. However, the same Qupai used for two different Nanguan pieces could be possible for us to compare since they are all based on the same dialect but with different content of text. At this point, we may surprisingly find that even in the circle of Nanguan, the variation or modification on the same Qupai could also be very large. For example, one of the famous

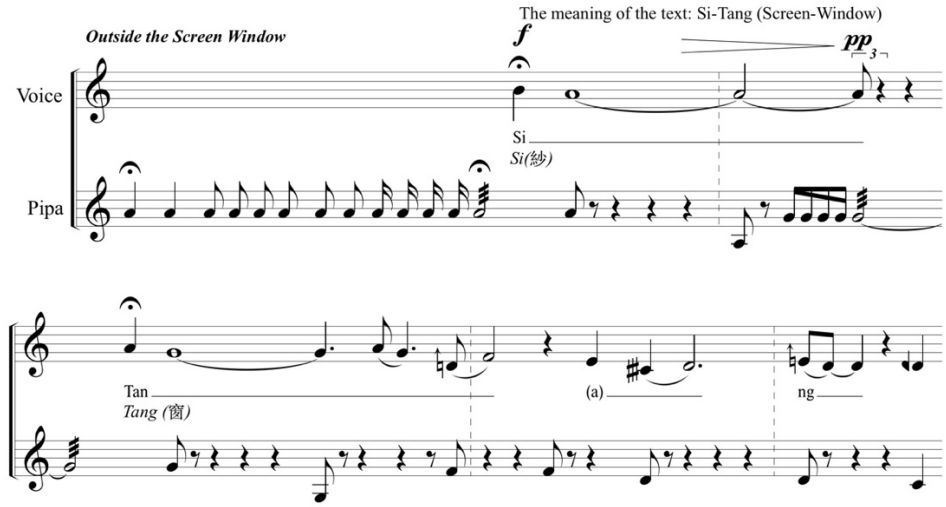
[114] Lin, Po-chi, *The Research of the Singing Theory in Nanguan* (南管唱曲研究), p. 120.
[115] Ibid., p. 124.

Qupai, *Yue-Hu-Yin* (越護引), is used by two Nanguan pieces, *Winter Cold* (冬天寒), and *Outside the Screen Window* (紗窗外).[116] The singing part are almost different, but the core melody of pipa are somehow remained the similar contour. I transcribe the first phrase of these two pieces as follows:

Example 1a – *Winter Cold* (first phrase with the vocal part and pipa). Soloist: Xiaoyue, Cai.[117]



Example 1b – *Outside the Screen Window* (first phrase with the vocal part and pipa). Soloist: She, Heng-De[118]



[116] Ibid., p. 138.
[117] Chine, Nan-Kouan: musique et chant Courtois de la Chine du Sud (Nan Sheng She ensemble/ Cai, Xiaoyue) France: Ocora CD (1988).
[118] 自來生長 (Zi Lai Sheng Zhang): Nanguan ensemble (Chin-He Nanguan ensemble/She, Heng-De) Taiwan: Golden Records, 2015.

In Example 1, we could see that the form of the Qupai in the second piece, *Outside the Screen Window* is very different from that of *Winter Cold*. In Example 1b, the rhythmic duration is longer than the first piece. Also, even though the core melody are almost the same, *Winter Cold* has more melodic inflections than *Outside the Screen Window*. So, heterophony is not only referred as the musical texture, this concept might also exist between two pieces in which the same Qupai is used. In this case, we could see that the same Qupai could be widely varied and modified if the musical context is different.

In the next part, I want to focus on how the sonic quality and the tonal inflection of Minnan dialect influence the embellishment of the vocal part so as to examine the formation of heterophonic texture between the vocal line and the instrumental part. If we can grasp the idea that how the text is manifested through some singing techniques of Nanguan, we probably have a better idea to realize why the Qupai is sometimes greatly varied because of the difference of the texts. So, first, I think it is important to know about the teaching of singing in Nanguan tradition.

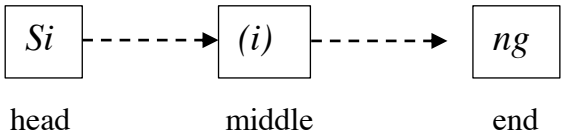
In Nanguan teaching, the students have to learn with the master in the club of Nanguan. According to Lin, the lesson is always one by one. The master usually first read the text aloud and the student will repeat after him or she for two times in order to make sure the pronunciation is perfect.[119] This tradition is usually being called Jiao-Tzu (Reading the Word Aloud, 叫字) by Nanguan scholars. In Jiao-Tzu, the beginner has to carefully listen to how the master pronounces the text and to feel the sonic shapes and vocal gestures of the language wholeheartedly. After the perfection of pronunciation, the student can just move to learn to sing the melody.

With knowing about the teaching of Jiao-Tzu, I would like to further progress to the structure of the word. In tradition of Nanguan music, a single word is usually divided into three different parts: head part, middle part, and end part. Each part of the word may comprise of a

[119] Ibid., p. 52.

specific syllable. For example, the word, *siong* (思), meaning "thinking" in English, could be divided into three different parts as shown in Figure 3. [120]

Figure 3



In fact, this way of singing technique has been prevailing for a long time in China. In *Essential of Making Music*, Sheng refers his discovery about the division of the word. I translate that paragraph as follows:

> I try to examine the structure of the Chinese pronunciation and suddenly realize that each sound of the word could be subdivided into several parts. This is the way how singers sing the word. The upper part of the word is the head; the lower part of the word could be analyzed as the middle and the end part. For example, the head of the word, *Dong* (meaning "east" in English), is "*Do*", and the middle part is "*Ong*". [121]

Usually, composers may assign a long melodic line for the head part or the middle part of the word, resulting in the form like the melismatic style. With this tradition, the sound of the word is hardly recognized if its head part and end part are arranged by the long melodic line. In Nanguan, such technique is usually called as Tzu-Tou, Yun-Chiang (Ornamentation on the Head Part of the Word, 字頭韻腔) or Tzu-Wei, Yun-Chiang (Ornamentation on the End Part of the Word, 字尾韻腔) (See Example 2 below).[122]

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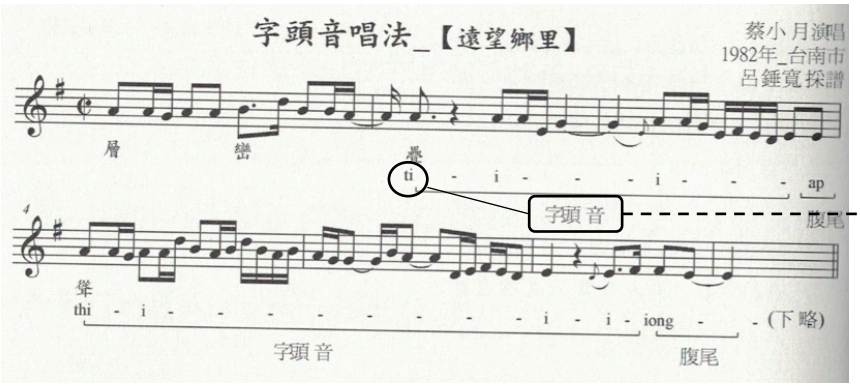
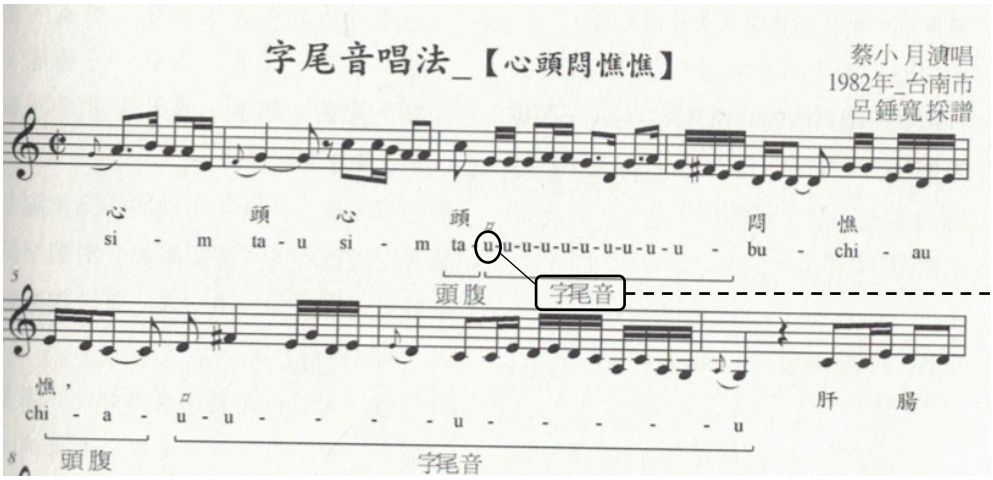
[120] Lu, Chui-Kuan, *Music from the Long Distance*, p. 195.
[121] Original context: 予嘗考字於頭腹尾音，乃恍然知與切字之理相通也。蓋切法即唱法也，…上面一字，即可以字頭為之，下面一字，即可以字腹、字尾為之，如東字之頭為多音，腹為翁音。
[122] Lu, Chui-Kuan, *Music from the Long Distance*, p. 198.

Example 2a – singing from Tsai, Hsia-Yue and transcribed by Lu, Chui-Kuan



Ornamenting on the head part of the word

Example 2b – singing from Tsai, Hsia-Yue and transcribed by Lu, Chui-Kuan



Ornamenting on the end part of the word

The sonic gesture of the syllable plays a decisive role in shaping the melodic line and the timbre of the vocal part, which is the reason that makes the heterophonic texture of Nanguan so unique. According to Lin, Po-Chi, if the syllable has the nasal quality, such as “n” or “ng”, the experienced singer of Nangaun should embellish the core melody with the upward melodic line not over the range of minor 3rd interval due to its difficulty of singing the nasal word. The vocal sound may produce the effect of ethereal and delicate timbre. On the other hand, if the syllable is mainly comprised of vowel, such as the word “gua” (means “me” in Minnan dialect), the vocalist can sing descending melodic line to embellish the core melody because of the stable sonic quality of that vowel.

However, these rules, as what I observe in some articles of Nanguan so far, are not always consistent. Lin also points out the truth that the Minnan dialect has been mixing with the elements of other dialects from different regions of China, and it keeps changing and developing until today. So, with its changing nature, it is impossible to make the general rules of the technique of ornamentation based on the specific word or syllable. Also, There are so many clubs of Nanguan in Taiwan, each of which may have their own ways of interpretation. The pronunciation in each club could be uniquely different if the vocalist learned this dialect in the different period of time.

In addition to the syllable of word, its tonal inflection may also affect the contour the melody as well, which could be other reason for the vocalist to decide how to embellish the core melody of pipa. The tonal inflection of Minnan dialect is quite different from Chinese. There are up to seven tones, each of which suggests different sonic contour that needs to be carefully treated by the singer. In the next part, I would like to use the Nanguan piece, *Let Us Promise*, to examine how the tonal inflection of the text affects the shapes of melody. The following analysis also reveals that how the texture of heterophony is formed in the interaction between vocal part and instrumental part.

III. Analysis on Nanguan Work - *Let Us Promise*

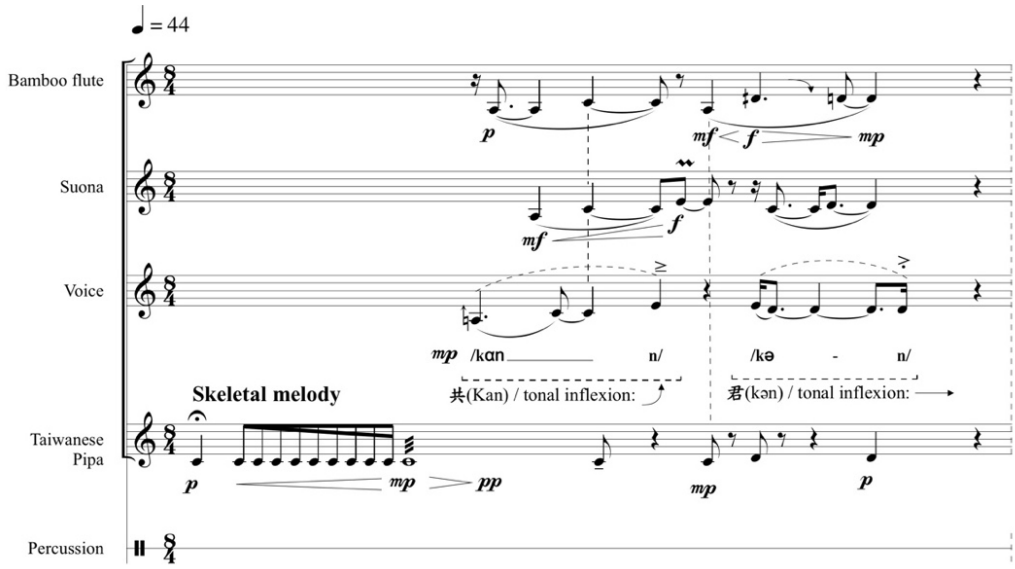
Taking the Nanguan piece, *Let Us Promise*, as example, I show each tonal inflection of the word in the first sentence of the piece as following Table 1.

Table 1

共/Kɑn/	君/kən/	斷/dæ-ən/	約/i-yo/
↗	→	↗ →	→ ?

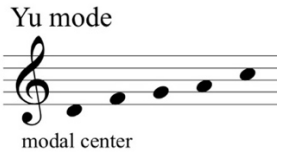
In the beginning part, these four words are musically transformed into the melodic line that fit the sound of tonal inflection. The word “Kɑn” (共), for example, is sung with an ascending arpeggio, A-C-E, in order to make the rising tone of the word stands out. (See Example 3)

Example 3



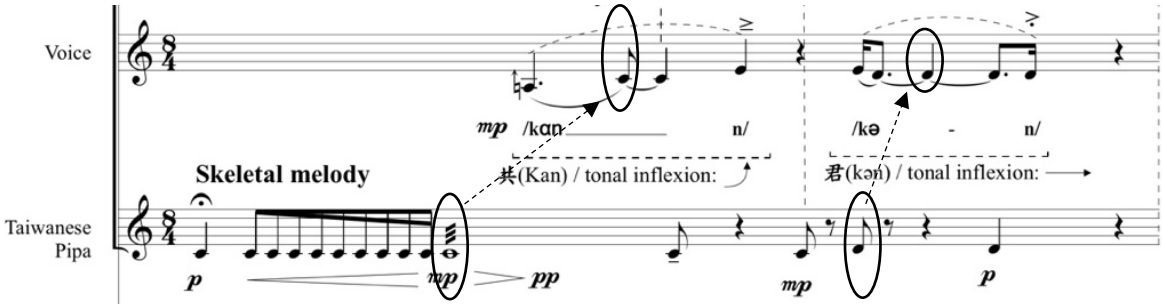
The second word, “kən” (君), is the level. In Example 3, this word is assigned with a sustained D preceded by a short E. Also, the D, in this piece, is the tonic of the *Yu* mode, which is the most stable note in the mode (See Example 4). Hence, the design of melodic line with a specific word is also closely bound with the theory of the modal system.

Example 4



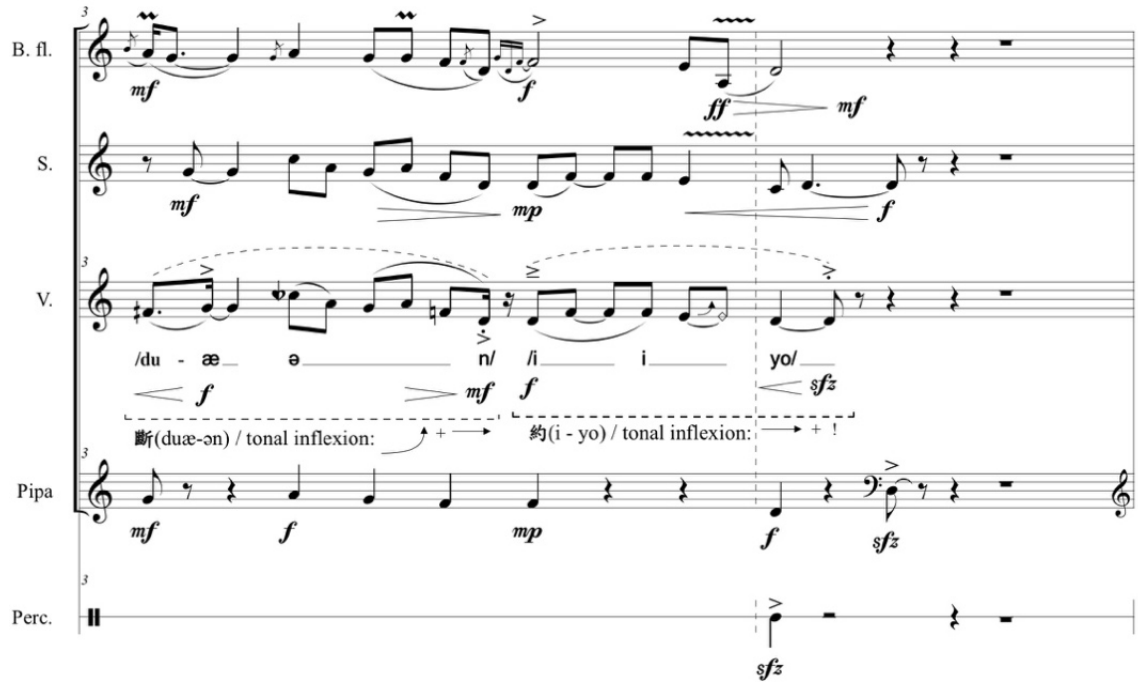
In Example 3, “kən” is the flat tone that needs to be assigned with a stable melodic line. However, it is not enough to merely place the sustain note without the consideration on the musical theory. The stable quality could be achieved not only in its design of gesture but also the tonic of the mode. In this way, the incorporation between the word and melodic line make a perfect sense both in the theoretical and phonological way. If we only extract pipa and vocal part, we could then understand that how the tonal inflection plays a significant role in embellishing the core melody of pipa to form the heterophonic texture. (See Example 5)

Example 5



In pipa, the core melodic progression is merely an ascending major 2nd, which forms the idea of resolution from the 7th degree, C, to the 1st degree, D, of the modal scale. The vocal part wraps the pitch C of pi-pa with the arpeggio figure to form a beautiful round shape. Also, the C and D in both parts, voice and pipa, are not synchronized but slightly staggered. The other instruments (See Example 3), including suona and bamboo flute, also follow the vocal line but with a slight delay. All these elements form the texture of heterophony in Nanguan.

Example 6



In Example 6, the word “duæ-ən” (斷) is transformed into a sudden rising of melodic motion followed by gradual descending. As Table 2 has shown, this word is comprised of two syllables, “duæ” and “ən”, which provides rich materials for the vocalist to embellish the core melody of pipa. Interestingly, If we follow the rule of the first musical phrase, the second syllable of the word, “dæ-ən", should be accompanied by the flat melodic line. Instead, the vocalist presents a gradual descending melodic line. It does still match the rule of *Essential of Making Music* of Shen: The word in the level, on the other hand, could be sung with the melodies in either high or low, but should be carefully treated and don’t confound with other two tones. So, this is the flexibility in the level of the word that singer can decide how to sing it.

VI. Harmony in Nanguan Music

In *Research of the Singing Theory in Nanguan*, Lin refers that the highest state of the musical aesthetic in Nanguan is harmony (*Ho* in Chinese).[123] The interaction between each

[123] Lin, Po-chi, *The Research of the Singing Theory in Nanguan* (南管唱曲研究), p. 370.

member in the ensemble is to try to 'harmonize' with each other. The terms, 'harmony' and 'harmonize', are obviously not designed for the context of non-Western music. In the Western tonal system, 'harmony' is the theory that the simultaneous and instantaneous sounding pitches are governed by the particular rules in which both dissonance and consonance are carefully treated in the construction and progression of the chords. Nanguan, on the other hand, is, of course, not based on such system. Yet, I think the 'harmony' is still the best translation for the concept of "*Ho*" in Nanguan music. In the dissertation, *The Radif as a Basis for a Computer Music Model*,[124] I quote the argument from Yadegari as follow: [125]

> The word such as 'tonality' and 'harmony' have fairly specific technical definitions in Western music literature…we actually use such terms only for educational and Communicative purposes and note as any concepts that have intrinsic or fundamental truth. The ideas of specificity, technicality, and definition, come from the scientific paradigm which is mostly formed within an axiomatic model.

Apparently, for some people who never receive the formal musical training may not be able to understand the meaning and the connotation of 'harmony' when a professional musician uses this term to describe the progression of chords. Yadegari shows the definition of harmony in the Merriam-Webster dictionary in which this concept is explained in the broader way. It lists several distinctive features of 'harmony':

1. A pleasing or congruent arrangement of parts
2. Correspondence, accord
3. Internal calm

In the above following definitions, the term, 'harmony', is successfully connected to the common and general understanding. More importantly, these three definitions are also associated with the concept of "*Ho*" in Nanguan music. Although the correspondence between each part in the

[124] Shahrokh Yadegari, *The Radif as a Basis for a Computer Music Model*.
[125] Ibid.

ensemble is not based on the instantaneous point of pitch, the state of harmony that those performers search is achieved only by following each sentence of the text and the melodic line of the vocal part. As we mention above, most Qupai in the music of Nanguan are originated and inherited from mainland China. Today, some Qupai in Nanguan may still be varied or modified in order to meet the need of the various interpretations of the text.[126] Given that each performer is very familiar with the original Qupai and its current form in Nanguan, this particular Qupai is served as the shared memory in each performer's mind, and they use this melodic prototype as a reference to develop and vary based on their own instrumental vocabularies. Hence, the performance of Nanguan music is actually the process that all performers bring their own melodic line to merge with each other. The difference from each is then unified by the frame of Qupai and the structure of the text. So, the concept of heterophony that we used to describe the music of Nanguan is probably the mere superficial observation. What hidden behind this complicated texture is the highest state of harmony that all Nanguan musicians endeavor to achieve.

One-Note Heterophony and Scelsi Giacinto

In the first section of this topic, I have examined the relationship between the text, vocal part, and its interaction with other instrumental parts in the music of Nanguan. The dramatic materials and the structure of the word are all very important elements for the formation of a certain type of heterophonic texture. In this part, I want to focus on the works of the modern composer to see how the idea of language could be further developed and cultivated as the important part of the heterophonic texture. We could also see the possibility that how heterophony could present itself in a very different way.

[126] Lin, Po-chi, *The Research of the Singing Theory in Nanguan* (南管唱曲研究), p. 124.

The study of this part is to examine the employment of the voice in heterophonic texture in those works composed by the Italian composer, Giacinto Scelsi (1905-1988). The late works of Scelsi has been inspiring me in many different aspects. His notable idea of the single note or sound development is characterized by the techniques, such as sonic oscillation, microtonal inflections, and timbral transformation, greatly draws my attention when I tried to experiment with the sonic characteristic of language to open different sonic expressions. Scelsi's awareness of the depth of the sound brings his works to the new horizon that it is impossible to use any mean or model to analyze.[127] As Tristan Murail (1947-) refers, instead of composing, Scelsi's music is more like the exploration of the sonic entity through the process of de-composing.[128] The composer is concerned about the basic components of the sound, including densities, harmonic spectra, and the dynamic, etc., and he tries to use these materials to reconstruct the new sonic world. Many articles about this approach have been extensively elaborated. However, from the essays in English that I have read, the use of the term, heterophony to describe Scelsi's music is not that frequent. The sonority made of the blend of simultaneous timbral transformation based on the same note forms a very unique heterophonic phenomenon, which is also similar to that of Asian music, such as Japanese togaku, in which the phenomenon of simultaneous variation is occurring in the single note. With this idea, I'm more interested in how the heterophonic texture is formed in Scelsi's compositions, especially those works with voice.

The England musicologist, Ian Dickson, who is specialized in the music of Scelsi, considers his late works as the Monotone-Based Heterophonic Style:[129]

> In this style, Scelsi fuses parts together to create the illusion of a single, complex sound object; strong individuation of the parts is relatively infrequent. He achieves this effect of fusion to a certain extent by imposing global pitch constraints – harmony is based on

[127] Ian Dickson, Towards a Grammatical Analysis of Scelsi's Late Music, p. 217.
[128] Tristan Murail, Scelsi, De-composer (translated by Robert Hasegawa). *Contemporary Music Review*, Vol. 24, No. 2/3, 2005.
[129] Ian Dickson, Towards a Grammatical Analysis of Scelsi's Late Music, p. 222.

> unisons, octaves and quarter-tones, and melodic motion is mainly by quarter-tone step or glissando – and by using local disguise strategies.

Dickson is probably the first musicologist who uses the term, one-note heterophony, to describe Scelsi's music, which accurately points out the most salient feature in this complex sound object formed by the blend of different tone colors based on the same note. So, how does Scelsi use the vocal part in the texture of one-note heterophony? This is his excellent grasp of acoustics that enables him to exploit the potential materials in the acoustic phenomena, including attack transients, beats, and the fluctuation of harmonic spectrum.[130] Especially in the vocal writing, it is interesting to note that Scelsi tries to distinguish the colors between consonant and vowel and uses them to articulate the "depth of the voice." Just like in Nanguan singing, each sound of the syllable in Minnan dialect has its own unique sonic quality, which allows the singer to embellish the core melody of pipa with the technique of ornamenting on the specific part of the word. This singing tradition is not only existed in Nangaun, but we can also find this in many different types of musical forms from different areas of Asia, such as Chinese Kunqu opera, Japanese Noh drama, and Korean Pansori, each of which has its unique singing technique used to articulate the phonetic characteristic of the text. As we know, Scelsi's interest and appreciation of Asian music is a very important reason why he could develop such unusual technique in his music.[131] In the following part, I will analyze the development of the phonetic feature in his vocal writing to see how the text is developed in the one-note heterophony. His pieces, *Manto* III and *Pranam* I will be partially analyzed.

I. One-note heterophony in *Manto* III and *Pranam* I

Manto (1967) is the piece comprised of three movements for solo viola and voice.[132] The world premiere was given by the viola performer, Geneviève Renon, whom Scelsi really admires

[130] Tristan Murail, De-composer, p. 178.
[131] Ibid., p. 174.
[132] Only in the third movement, the viola performer needs to sing and play simultaneously.

and trusts. The first performance of *Manto* was only two movements without the voice. It wasn't until 1978 that Scelsi sent the *Manto* III to Renon as the dedication with the following letter:[133]

> Dear Geneviève, here is something that looks like an improbable piece – if the result is acceptable one will call it *Manto* III. You can do everything you want with it, switch the vowels, replace them with others, which may invent, or can transpose everything or even throw it into the trash bin.

The difficulty of *Manto* III is notable not only because the performer has to sing and perform simultaneously, but the fingering techniques on viola and the text of the vocal part are also very hard to execute. However, as the above letter indicated, Scelsi might be clearly aware of this difficulty so he gave a large space for Renon to freely interpret and even to improvise. The pitch accuracy of the vocal part is also not strictly required. Scelsi notes that 'this text is a speech of the Sibyl, in other words a barely sung recitative.'[134] Thus, in this piece, he might consider that the color and the sonic quality of the text is more important than the pitch, and it is also this sonic characteristic of the word gives the depth to the sound.

About the text in *Manto* III, Scelsi also shared this idea with the editor of the West German Radio, Wilfried Brennecke, in the following dialogue: [135]

> *Manto* is the name of Sibyl, My stamps point to an origin in ancient Greece or somewhere in the archaic territory of the Mediterranean. As you know, oracles sometimes prophesy good things, sometimes bad things. They can occasionally also be terrifying, but often they only answer questions, either through speech or song.

Interestingly, the power of prophecy possessed by Sibyl might strongly resonate with Scelsi in a way that he also recognized his musical works as the messages from the universe. Scelsi disapproves of being called as a composer, but as a mediator who receives the sound from the

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[133] Giacinto Scelsi, Liner Notes to "The Viola Works", New York: Mode Records, 2011.
[134] Scelsi Giacinto, Manto : pour alto solo, Paris: Éditions Salabert, 1988.
[135] Giacinto Scelsi, Liner Notes to "The Viola Works", New York: Mode Records, 2011.

cosmos. What he did is just to transcribe those sounds from the universe down to the paper.[136] So, as the composer says, 'music does not need an explanation: neither through images, nor through any numbers.'[137] For this reason, we have to learn how to be satisfied with the simple thing and to appreciate the sonic entity as itself. In this case, the idea of one-note heterophony is one of the good options to observe Scelsi's music, since this nature of this concept is not based on the strict system like the twelve-tone method.

In this piece, the whole texture is based on the slow and gradual evolution of the timbres from viola and voice. In the beginning, these two parts initiate with the same note, A, to first establish the stable sonority as if they are merged into one sonic object. When the first syllable of the text, "*Ho*", is introduced at the m. 4, the overall texture starts growing divergent since the vocal part differentiates herself by emphasizing the color of the words. The following Figure 1 shows all the syllables of the text in *Manto* III and my observation of their colors and effects:

Figure 1

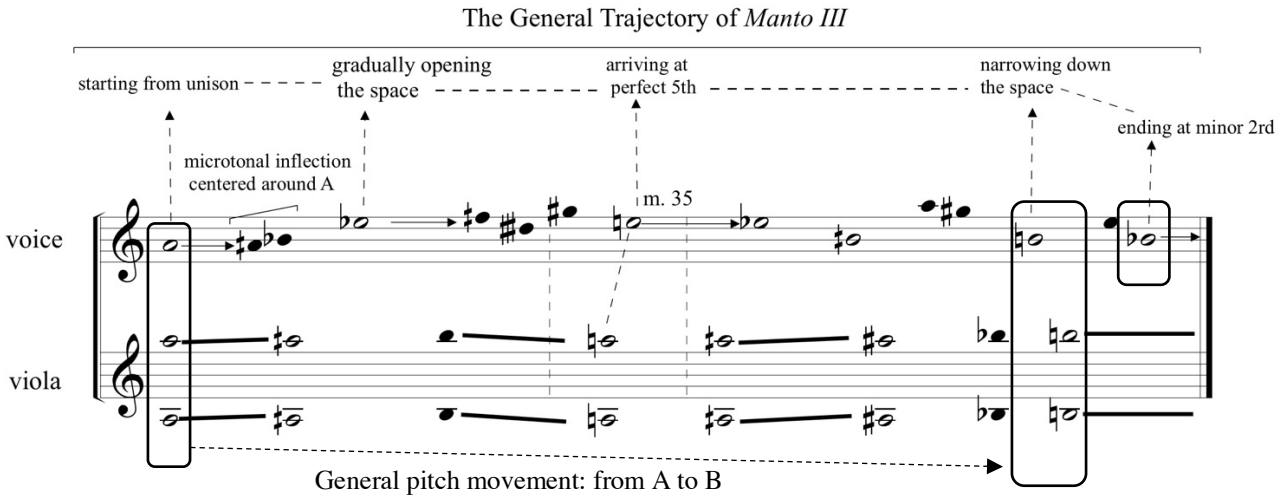
Syllable	Color and Effect	Syllable	Color and Effects
h	With the breathing effect. It provides the gentle quality of attack transient.	*d or t*	With sharp airy effect. The word with it as attack transient may create a high-frequency noise that is very easy to identify.
g or k	A solid attack which provides a clear identity of the words. It usually uses with the notes in short rhythmic value.	*ö*	The syllable pronounced with throat part can create a slight overtone.
v	With gentle breathing effect. The mouth shape of this syllable may limit the volume at the beginning.	*ü*	More overtone quality since the vowel is pronounced with the narrow oral shape.
r	It is usually played as flutter tongue technique.	*e, i, o*	The normal vowels that have different sonic shape.

Throughout the whole piece, the rhythmic activity, microtonal inflection, and pitch movement in the vocal part are more active than those in the viola part. On the other hand, the

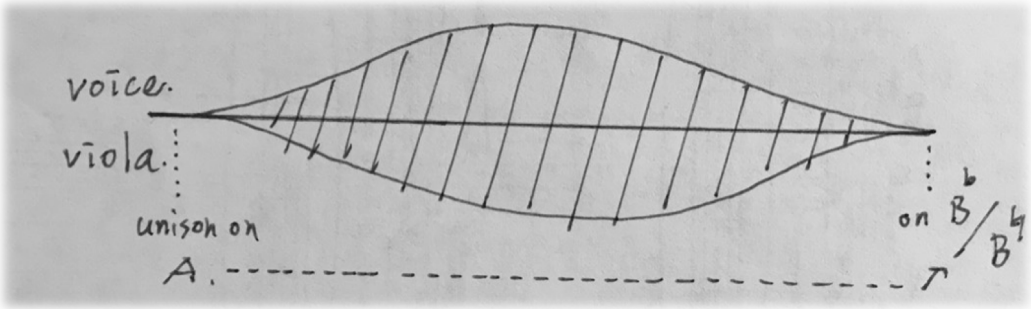
[136] Tristan Murail, De-composer, p. 175.
[137] Giacinto Scelsi, Liner Notes to "The Viola Works", New York: Mode Records, 2011.

viola part only provides the sustaining sound created by the normal bowing technique based on the A string and the natural and artificial harmonics produced by the D string, which is very similar to the effect of drone. While these two parts seem really different, they are all still restricted within the same range of the pitch movement, and sometimes in the specific intervallic structure. I summarize the overall trajectory of the pitch movement as follows:

Example 1a



Example 1b

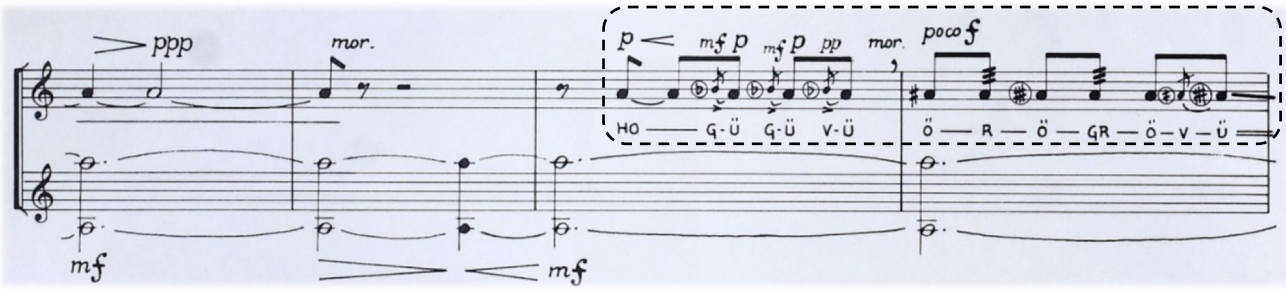


As Example 1a has shown, the whole piece is the process of expanding from the unison and narrowing down back to the small intervallic space (it could be realized as the figure that I briefly draw in Example 1b). If we look at the large pitch movement, from the beginning to the end, the viola part only proceed from A to B with the microtonal inflections moving around

them, while the vocal part has the similar pitch trajectory (also from A to B, but eventually ends on B*b*), but its pitch movement is much wider and has more varieties. Thus, I suggest that the viola part could be generally viewed as the skeleton (from pitch A to B as the primary structure) of the piece, whereas the voice embellishes this skeleton based on the sonic elements of the text to form the one-note heterophonic texture.

We could discern this texture in the beginning part when the performer starts singing the words in the recitative style (See Example 2 below).

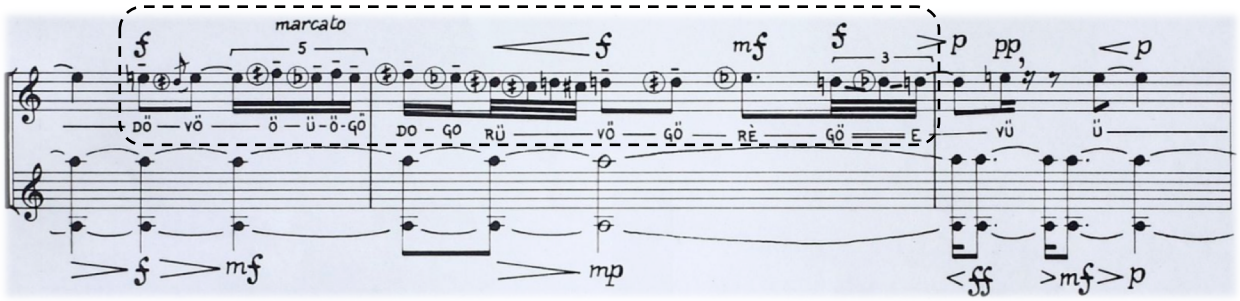
Example 2



Even though they are all played based on the same note, the expression of the vocal gestures is so rich that those consonants, including *h*, *g*, *v*, and *r*, can trigger different color of noises to embellish this single note. For the vowels, *ö* and *ü* might have very different levels of the sonic depth more than those of regular vowel sounds, such as *o* and *e* in English, because they need to pronounce by tightly rounding our lips. This particular technique enables us to create higher harmonic partials in the sound, which is another way to embellish the single note.

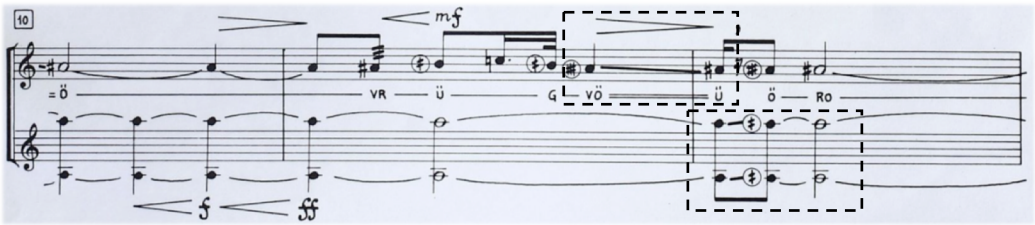
Let's see how the one-note heterophony is formed in the interaction between vocal part and viola part. In mm. 16-17 (see Example 3 below), the speech-like rhythm is employed to represent the words from Sibyl, which is the important feature in this one-note heterophonic texture.

Example 3



In addition, the text in the vocal part is not just used for showing their sonic characteristics. Scelsi uses the symbol, double-horizontal stroke, to indicate the gradual transition from one phoneme to another.[138] It seems to me that he tried to treat each syllable as individual musical material that could be musically developed based on its sonic qualities. With this technique, Scelsi is able to bridge the gap between each syllable to create a smooth sonic flow in a musical sense from one vocal sound to another. In this technique, their connection and transition are not based on the grammatical logic or specific spelling, but the common element in their sonic qualities. In fact, it blurs the identity of the word itself and generates the new sonic identity. With this idea, we could discern more interesting interactions between the vocal part and viola.

Example 4

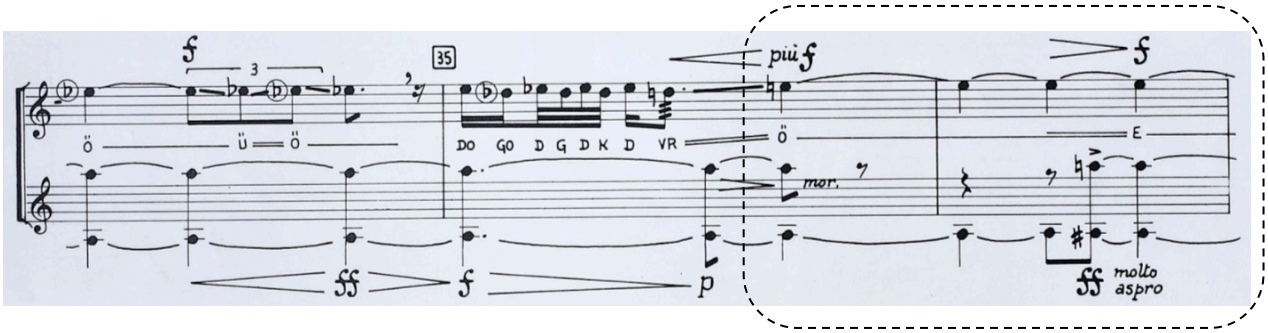


[138] Scelsi Giacinto, Manto : pour alto solo, Paris: Éditions Salabert, 1988.

In Example 4, the gradual transition from *vö* to *ü* is assigned with a short glissando from the quarter A# to the original A#. This gesture is responded by the short glissando of viola part. This is the clear example showing that Scelsi utilizes the sonic characteristic of the syllable transition to interact with the viola part. In this way, both parts are embellishing the single note A# based on their own techniques and colors, resulting in a very unique one-note heterophonic texture. Hence, unlike that Nanguan singers who endeavors to articulate the word in order to let audience understand the meaning of text, the text part in this piece is mostly served as the musical materials for embellishing the viola part. The meaning of the text in this piece is not very important.

At m. 35, the use of syllable *ö* on E with the viola on A reveals a very unusual spectral dimension of the sound (Please see Example 5).

Example 5



At mm. 35-36, the syllable *ö* is gradually moved to *e* while the viola proceeds from natural A to the double stop on A# and A-natural. In this moment, they all create the perfect 5th interval. This vertical sonority may suggest the harmonic spectrum based on the pitch A played by the viola part. At this point, even though both parts aren't on the same pitch, the sonority of the perfect 5th has the consonant quality that we might tend to aurally perceive them as one

inseparable sonic object. Also, since the sound of *ö* has a wider harmonic partials, it is easier for Scelsi to employ it to establish the harmonic spectrum based on the pitch A of viola.

Scelsi's sonic sensitivity enables him to establish a new depth of the sound by employing the acoustic elements. This is the very important feature that makes his heterophonic writing so different from other composers. In this analysis, it shows that Scelsi is able to cross the boundary of "one note" by using the sonic elements from different harmonic partials to reconstruct a new blending of the sound, which is seen as the important technique that has later influenced the spectral composers, such Tristan Murail.[139]

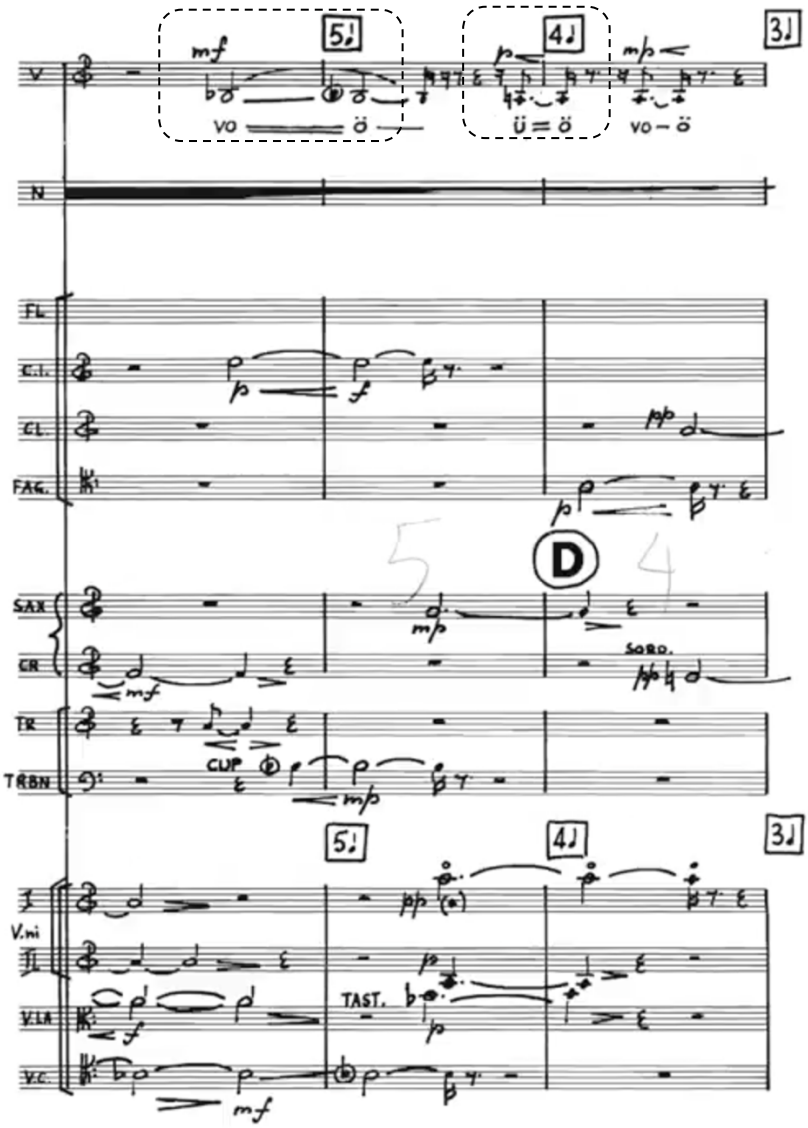
In addition to *Manto* III or the early works with voice, Scelsi's exploration on vocal writing is still continuing until his later works (after 1970), such as *Antifona "on the name of Jesus"* for male choir (1970), *Le grand sanctuaire: "II est grand temps" & "Meme si je voyais"* for tenor voice (1970), and *Three Latin Prayers: Ave Maria, Pater noster, Alleluia* (1970). In those works, we can still hear that how Scelsi tries to use the phonetic features as the sonic materials to create the unusual sound object. *Pranam* I for soprano voice, twelve instruments, and tape, is another large ensemble piece that he also used the technique of one-note heterophony. This piece was composed in 1972 which is the time when Scelsi's music began to grow more mature and ascetic.

Since there are more instruments involving in the process of making the texture of one-note heterophony, the overall inner interactivity between vocal part and instrumental parts is more complex than that of *Manto* III. Moreover, Scelsi's use of the tape in this piece brings his music to the new experimental level that none of his previous work could be paralleled with. However, his way of vocal writing is still remained the same as those previous works such as *Manto* III. For example, the technique of gradual transition between two different phonemes is

[139] Tristan Murail, "Scelsi, De-composer," p. 173.

still the primary way to connect various types of syllables (See Example 6 below). For what I observe, the vocal part in *Pranam I* might be less complex in terms of its development of phonetic elements, rhythmic activity, and the microtonal movement.

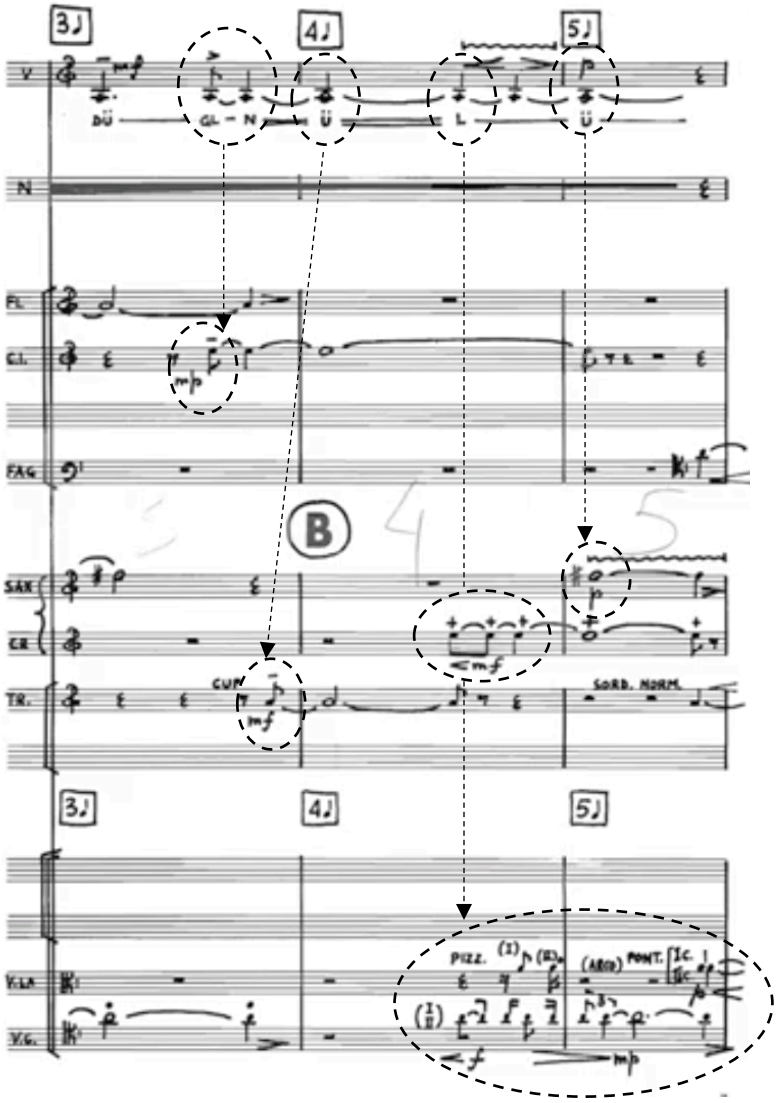
Example 6



On the other hand, the interaction between the voice and instruments becomes more intricate. In several parts, it is very clear to hear Scelsi's astonishing orchestration of the blend of timbres based on the single note. Also, when the voice changes the phonetic element, the

instrumental part also immediately responds to it by changing the combination of instrumental colors, beautifully coordinating with the progression of vocal part (See Example 7).

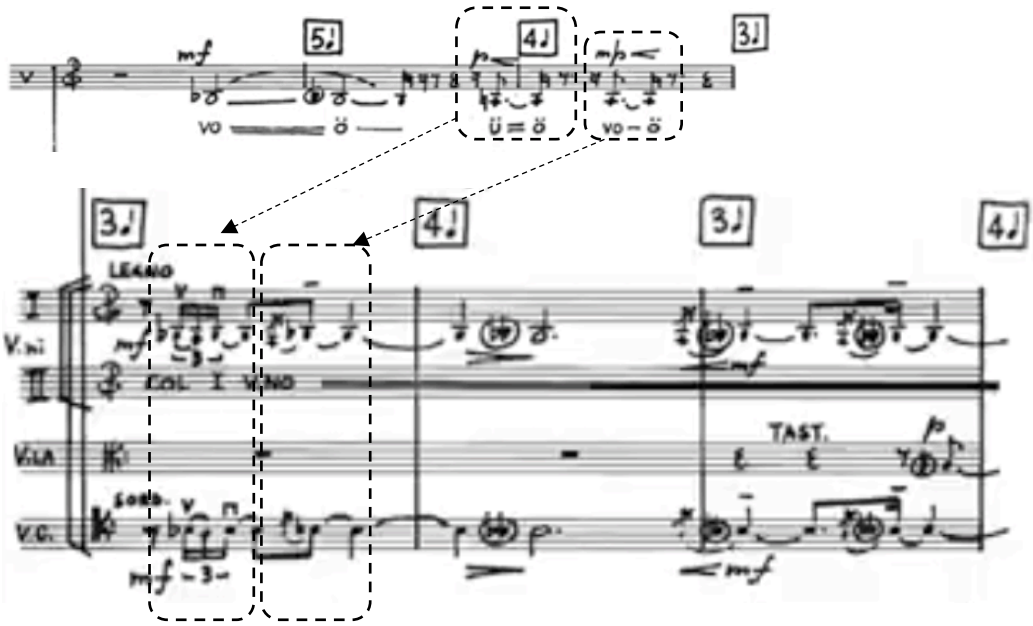
Example 7 – the interaction between vocal part and instrumental parts



In Example 11, the flow of the inner interactivity among these parts enriches the whole sonorous body of the "one-note" in which the heterophonic texture is created. Furthermore, this interactivity also includes the way of imitating the gestures of the other part. It is very clear to see in the following Example 12 where Scelsi tries to use the string parts to imitate the sonic

characteristics of the vocal part and to further extend it to become more animated gesture in the string part.

Example 12



These are some salient features of heterophonic texture in the music of Scelsi. In the following part, I want to present some musical examples of mine to discuss how I have synthesized these elements to create my heterophonic texture.

Personal Approach to Heterophony

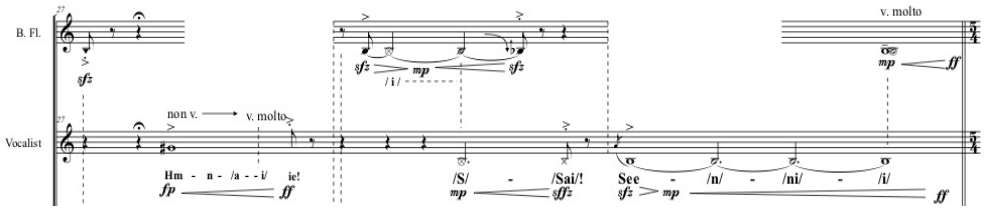
As Nanguan and the music of Scelsi have revealed to me, I'm also envisioning the sonic characteristics of the language as the potential material for constructing of my heterophonic texture. Since 2017, I began working on the piece, *Rising Vision* for female voice, bass flute, double bass, percussion, and piano. In this piece, each word of the text itself is not only served to provide the meaning, but its vocal gesture, such as the contour of vowel and the percussive color of consonant, also provides the rich materials for me to develop the musical line in a different way. With this inspiration, I was also wondering how my heterophonic writing could be

distinguished from that of Nanguan so I'm not merely imitating the making of traditional music. When I worked with vocalist, Barbara Byers, in *Rising Vision*, her capability of using unusual singing techniques to creatively vary and distort the word have influenced me profoundly. With the productive input from her, I found some interesting ways to maximize the expression of the musical line.

In Scelsi's works, the direct employment of the phonetic feature in the development of the single note enables him to create different kinds of sonic depth in his music. However, as we could see, the way how Scelsi uses the phonetic materials is to merely emphasize the certain part of the word by intensifying its sonic characteristics so as to make audience aware that the sounds of the phonemes are treated as the part of the musical materials. On the other hand, the technique of gradual transition between two different phonemes is actually the first important step to cross the rules of grammatical structure by focusing on the sonic characteristic. In this process of transition, we can hear that different phonetic materials are varying, flowing, and transforming, as the way that how musical materials are developed by the composer. In *Rising Vision*, the phonetic features from the text, "I can see the light" are served as the primary sonic materials.[140] The order of the words of this text is totally rearranged in terms of their sonic characteristics. In this way, "I" and "light" could be easily connected together since they share the same vowel. "See", on the other hand, has an acute quality of sound which is very flexible to be transformed to other phonemes, such as "t", "th", "c". With these clear sonic features, I could also connect them with other instrumental parts to create the texture of heterophony (See Example 1 below)

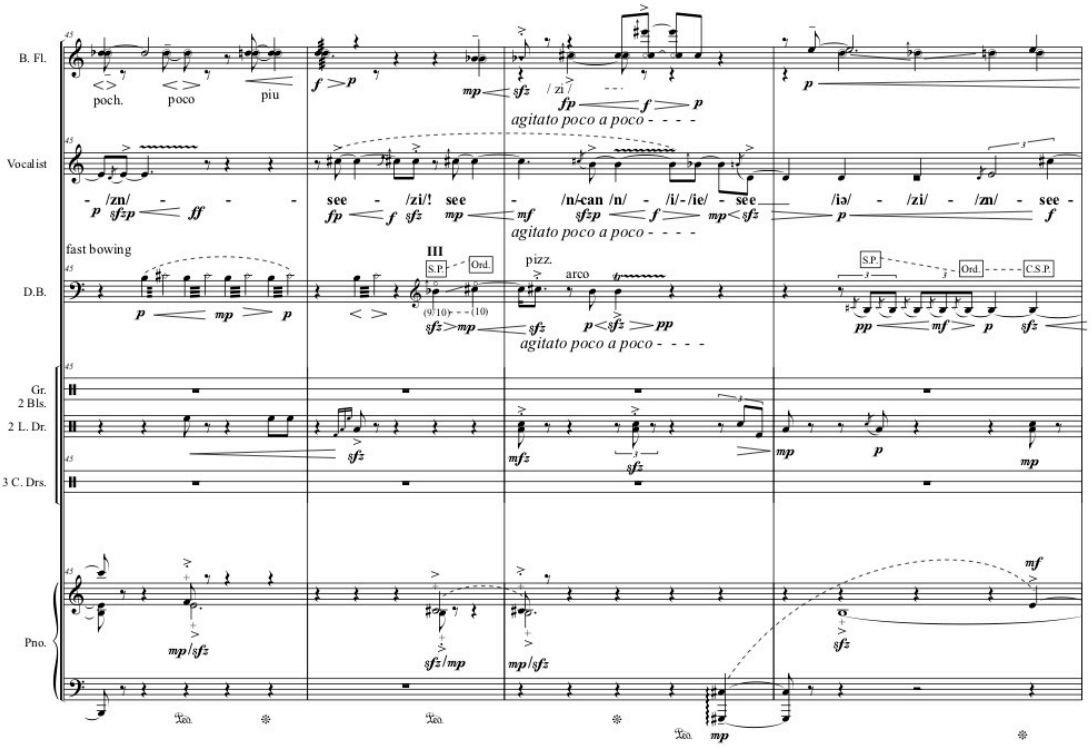
[140] The whole text of the piece is only based on this one sentence.

Example 1



In this Example 1, the vocalist sings the airy sound of "s" to interact with the airy noise of the bass flute part. In the larger interaction within multiple instruments, different phonetic materials could respond to more instrumental colors, which creates a complex net structure (See Example 2 below). In Example 2, I try to connect the consonant, "k", with the percussion part and the consonant, "s", with the airy noise of the bass flute, while the vowels are used to interact with the clear pitched sound of the double bass and the bass flute. Each vocal sound is strengthened through my careful control of the timbres so that audience may perceive this intricate interaction between vocal part and the instrumental part. It is also the way that I try to open up the dialogue between the acoustic instruments and the vocal part.

Example 2



The singing technique of Nanguan, such as Tzu-Tou Yun-Chiang,[141] also influences my vocal writing to some degree. The technique of ornamenting on the particular part of the word makes me possible to create a long and expressive musical line by greatly varying the timbres of the English phonemes. So, I try to apply the singing technique of Nanguan to English text so as to create a different way of development on the sound of English phoneme. This is the idea that I try to synthesize the element of Nanguan and the technique of one-note heterophony of Scelsi. With this idea, I want to create the environment where all sonic ideas, phonetic sounds and instrumental sounds, could be fused together without barriers, forming the new sonic vision that I'm always imagining.

The purpose of this study is to reveal some aspects about how the texture of heterophony is formed. As we could see, the text and dramatic element are the primary materials for the interaction between the vocalists and instrumentalists. And the melodic embellishment in the vocal part is actually the important part to show how the sonic quality and the expression of the text could affect the movement of the musical line. At this point, we know that the heterophonic texture in the music of Nanguan is not merely comprised of the free-improvisation. With this inspiration from Asian music, we could see that how Scelsi employed this technique to establish his unique musical language. Hence, this research shows the importance of the language in constructing the texture of heterophony.

[141] Tzu-Tou Yun-Chiang literally means the singing technique of ornamenting on the head part of the word.

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