

ROGER REYNOLDS' *VARIATION* (1988): NEW CONCEPTS OF FORM AND SOUND

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American composer Roger Reynolds was born on July 18, 1934, in Detroit, Michigan. At age 14, he determined to study piano after hearing a recording of Chopin's Polonaise in A-flat major, Opus 53 played by Vladimir Horowitz. Even though his piano teacher Kenneth Aiken recommended that he continue his study at the Curtis Institute of Music, Reynolds followed the suggestion from his parents that a musical career was not practical. After receiving a bachelor degree of engineering physics at the University of Michigan, he worked in the industry for a short period of time. In 1957, he returned to Michigan and resumed his study of music by taking a class called Composition for Non-Composers under the instruction of Ross Lee Finney. Reynolds continued his compositional study with Finney and Gerhard who were influenced by the Second Viennese School until he finished the master's degree (B.M. 1960, M.M. 1961).

Variation was written under the auspices of The Banff Centre for the Arts in 1988. This piece was dedicated to Peter Serkin and premiered by Alec Karis, a faculty member at UCSD, on December 3, 1991 at Merkin Concert Hall, New York. This large-scale set of variations for piano is one of the rare instances in which Reynolds used a conventional genre. What concerned Reynolds most in *Variation* was "the notion that transformations of meaning could occur entirely as a result of changes in context." He designed this variation as five sections –*capriccioso* and I, *grave* and II, III, *scorrevole* and *coda*. *Capriccioso*, *grave* and *scorrevole* also refer to the three basic thematic elements of this piece. These three main themes appear throughout the whole piece employing fragmentations or superimpositions. Reynolds used two computer algorithms (SPLITZ and SPIRLZ) to make transformations on these three thematic ideas. He cut the themes

up into small fragments, and then recombined these fragments into a kind of altered mosaic. This process resembles his experiments on words: he disassembled words into elementary figures (dots, lines, etc.) and gathered them into new figures, i.e. new words.

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PREFACE

Roger Reynolds has maintained his position as one of the leading American contemporary composers for more than three decades with his tireless experiments in musical conceptualism. Along with serialism, the tradition of American experimentalism, which started with Charles Ives and continued with John Cage, was the strongest influence on the music of his early period. Additionally, due to his scientific background one hears strong mathematical intellectuality in his music: he majored in engineering before starting formal musical studies. His output encompasses electronic and computer-processed music as well as conventional instrumental and vocal music.

The purpose of this thesis is to introduce this important American composer's piano music, especially *Variation* (1988) that shows not only his skill with traditional piano variation writing but also the composer's own innovative concepts. This author will explore how the composer approached variation form and how he gave a personal voice to a technique which has a long history in Western music. Other important characteristics of this piano music – originality of notation and sonority– also will be discussed.

CHAPTER I

BIOGRAPHY

“It was, again, a practical attitude. Here I am. I am a contemporary person. Everyone around me is a dedicated musician, and they’re not playing music that has any direct relationship to our time. Why? So, I took a course that Ross Finney taught at Michigan, which was ‘Composition for Non-composers’.”¹

American composer Roger Reynolds was born on July 18, 1934, in Detroit, Michigan. At age 14, he determined to study piano after hearing a recording of Chopin’s Polonaise in A-flat major, Opus 53 played by Vladimir Horowitz. Even though his piano teacher Kenneth Aiken recommended that he continue his study at the Curtis Institute of Music, Reynolds followed the suggestion from his parents that a musical career was not practical². After receiving a bachelor degree of engineering physics at the University of Michigan, he worked in the industry for a short period of time. In 1957, he returned to Michigan and resumed his study of music by taking a class called Composition for Non-Composers under the instruction of Ross Lee Finney. Reynolds continued his compositional study with Finney and Gerhard who were influenced by the Second Viennese School³ until he finished the master’s degree (B.M. 1960, M.M. 1961). In 1961,

¹ Roger Reynolds speaking with Harvey Sollberger, Roger Reynolds: Profile as a Composer, New York, C. F. Peters Corporation, 1982, 23.

² John Willett, “Roger Reynolds,” Musical America, November 1990, 30.

³ An American composer Ross Lee Finney (1906-1997) was a student of Alban Berg, Nadia Boulanger (piano), Roger Sessions and Edward Burlingame Hill*. Finney's students included Robert Ashley, William Albright, Leslie Bassett, George Crumb and Roger Reynolds*. Roberto Gerhard (1896-1970) was recorded

he co-founded the annual ONCE Festival for contemporary music with fellow composers Robert Ashley and Gordon Mumma in Ann Arbor and participated actively for three years. He interviewed John Cage as an editor of the university's art publication, *Generation*, with the title "Interview with Roger Reynolds."⁴ He received the Koussevitzky composition prize at the Tanglewood Festival where he studied with Gerhard again in the summer of 1961. And as a result of a Fulbright scholarship in the same year, he had the chance to work at the electronic music studio of West German Radio for a year. In this period he composed a theater piece, *The Emperor of Ice Cream*⁵ (1961-62, rev. 1974) for 8 voices, percussion, piano and double bass, which introduced his innovative notations.

With his wife's Fulbright grant in flute in 1963 and the Guggenheim Fellowship for himself, Reynolds stayed in Europe until 1966. While he worked at the American Students' and Artists' Center in Paris, he wrote prolifically producing such works as *Fantasy for Pianist* (1963-64), *Graffiti* (1964) (orchestra), *Quick Are the Mouths of Earth* (1964-65) (strings, woodwind & brass ensemble, percussion, piano), *Gathering* (1965) (woodwind quintet) and *Ambages* (1965) (solo flute).⁶ During European residencies at

as the only Spanish pupil of Arnold Schoenberg**. Gerhard studied with him during the period of 1924-1928**. Before this, he studied piano with Granados and composition with Pedrell**.

* from the websites <http://www.themodernword.com/joyce/music/finney.html> and http://www.umich.edu/~urecord/9697/Feb18_97/artcl08.htm

**http://www.boosey.com/pages/cr/composer/composer_main.asp?composerid=2716&langid=1&ttype=BIOGGRAPHY&ttitle=Biography

⁴ Later Reynolds and Cage left an article again – "John Cage and Roger Reynolds: A Conversation" (1979), *The Musical Quarterly*, Vol. 65, No. 4 (Oct. 1970), 573-594.

⁵ Reynolds set the famous poem, which has the same title by Wallace Stevens, about death in this piece.

⁶ He mentioned in an interview with Ralph Shapey: "I had decided after leaving Michigan that the thing I had to do, because of my late start, was to establish a basic repertoire of pieces. So I proceeded to write the pieces that I thought necessary, just to learn what I could learn, without any regard for whether there was a

the Rockefeller Foundation's Villa Serbelloni in Bellagio, Italy, the director of the Institute of Current Affairs offered him a Fellowship in Japan, which Reynolds accepted. Before moving to Japan, he premiered his electro acoustic work *Blind Men* (1966) whose ideas – experiments on controlling the timing of 'expository materials' – carried over to other works like *Threshold* (1967), *Again* (1970-74) and *I/O* (1970).⁷ During his residency in Japan (1966- 1969), he premiered the orchestral piece *Threshold* with conductor Seiji Ozawa; the intermedia work *Ping* (1968), a film made by Reynolds in collaboration with a Japanese cameraman and an avant-garde actor, was introduced. The title and the text of *Ping* were from Samuel Beckett's playbook. Other literary quotations can be found in many other pieces: *Quick are the Mouths of Earth* (1965) is from Thomas Wolfe; "...from behind the unreasoning mask" (1975) and "...the serpent-snapping eye" (1979) are from *Moby Dick* by Herman Melville; *Sketchbook (for The Unbearable Lightness of Being)* (1985) is from Milan Kundera.⁸

In 1969, he returned to the United States and began serving as a full-time faculty member at the University of California, San Diego where he remains to this day. Among the works from this time period are *I/O: A Ritual for 23 Performers* (1970) (9 female voices, 9 male mimes, 2 technicians/performers, 2 flutes, 1 clarinet, live electronics, slides), *Again* (1970, rev. 1974) (2 sopranos, 2 flutes, 2 trombones, 2 double basses, 2 percussion, 4-channel tape, amplification) and *Compass* (1972-73) (voices, cello, double bass, amplification, 4-channel tape, slides). In 1972, he established the Center for Music Experiment and Related Research (CME) which supported the activities of theater,

chance of their being performed." – from the article "Roger Reynolds (1980)," *Soundpieces: Interviews with American Composers*, eds. C. Gagne and T. Caras, NJ/London, The Scarecrow Press, Inc., 1982, 324.

⁷ Ralph Shapey, "Roger Reynolds" (1980), *Soundpieces: Interviews with American Contemporary Composers*, 326.

⁸ Kyle Gann, *American Music in the Twentieth Century*, New York, Shirmer Books, 1997, 170.

performance, dance, electronic, improvisation, computer analysis and synthesis of sound, as well as experiments with extended vocal techniques.⁹ His *Voicespace* series was created from the results of these vocal researches at CME. From *Voicespace I* to *V*, which span the period of 1975-1986,¹⁰ Reynolds used 4-channel tapes of recorded voices with a live voice. He experimented with multi-dimensional sound in this series by using pre-planned diagrams such as “sound paths and space functions”¹¹ or “location sequence stencil.” He collaborated with the video artist Ed Emshwiller by using videotapes and films at the premiere of *Voicespace III (Eclipse)* at the Guggenheim Museum, New York, January 1980. In 1981, he was invited to the Institut de Recherche et Coordination Acoustique/Musique (IRCAM), a French contemporary music institute directed by Pierre Boulez.

In 1989, Reynolds was awarded the prestigious Pulitzer Prize for *Whisper Out of Time* (1988, a title from John Ashbery’s poem) for string quartet and string orchestra. Kyle Gann mentioned that “*Whisper of Our Time* transforms quotations from Beethoven and Mahler in curved slow motion, as if in a convex mirror,”¹² and also said that Reynolds is “the first composer since Ives from an experimentalist background to win the normally conservative Pulitzer Prize,”¹³ After winning this prize he continued to write conventional works such as *Symphony [The Stages of Life]* (1991-92), *String Quartet*

⁹ Roger Reynolds: Profile of a Composer, New York, C. F. Peters Corporation, 1982, 3.

¹⁰ *Still (Voicespace I)* (1975): text from *The Wanderings of Cain* by S. T. Coleridge
A Merciful Coincidence (Voicespace II) (1976): text from *Watt* by S. Beckett
Eclipse (Voicespace III) (1979-80): text by Borges, Garcia- Márquez, Issa, Joyce, Melville and Stevens.
The Palace (Voicespace IV) (1980): text by Jorge Luis Borges
The Vanity of Words (Voicespace V) (1986): text from *The Unbearable Lightness of Being* by M. Kundera

¹¹ See APPENDIX.

¹² Kyle Gann, American Music in the Twentieth Century, 170.

¹³ Ibid., 171.

[Ariadne's Thread] (1994) as well as the electro-acoustic work, *The Red Act Arias* (1997).

In 1998, the *Watershed* series (1995) (percussion, chamber ensemble, computer) was released as a DVD to feature music composed for a multichannel medium.

CHAPTER II

REYNOLDS' PIANO MUSIC

Even though Reynolds frequently put a piano part in his many orchestral or electronic pieces, he only wrote three compositions for piano solo¹⁴: *Epigram and Evolution* (1959), *Fantasy for Pianist* (1963-4) and *Variation* (1988). Later he withdrew the earliest piano music, *Epigram and Evolution*, from his catalogue.

1. *Fantasy for Pianist*

Fantasy for Pianist was written during 1963-64 in Paris and was premiered by John Tilbury on September 26, 1965 at the Warsaw Autumn Festival. Reynolds was mainly concerned with sonority and embellishment when he sketched this complex composition whose ideas came from an analysis of the textural features of four photographs - stalks, vines and twigs in the snow.¹⁵ Also when he wrote this piece, he was very influenced by the playing of the American pianist Paul Jacobs (1930-1983).¹⁶ In this four- movement piece, serial techniques are applied to proportional time structure, pitch, dynamics, and touch characteristics.¹⁷ He introduced inventive notations of various tone clusters and different methods of playing the inner strings of the piano. These notations will be discussed later in this chapter.

¹⁴ This small output for piano is because he has been mainly concerned with ensemble music rather than solo instrumental music throughout his compositional career.

¹⁵ Roger Reynolds: Profile of a Composer, 45.

¹⁶ From the interview with Roger Reynolds, May 2003.

¹⁷ Roger Reynolds: Profile of a Composer, 45.

2. *Variation*

Variation was written under the auspices of The Banff Centre for the Arts in 1988.

This piece was dedicated to Peter Serkin and premiered by Alec Karis, a faculty member at UCSD, on December 3, 1991 at Merkin Concert Hall, New York.

This large-scale set of variations for piano is one of the rare instances in which Reynolds used a conventional genre. After the long and special history of piano variation technique (from Baroque chaconne and passacaglia to Schoenberg's concept of 'developing variation'), the process of variation itself became a very important subject to composers in the twentieth century – for example, Anton Webern.

What concerned Reynolds most in *Variation* was “the notion that transformations of meaning could occur entirely as a result of changes in context.”¹⁸ He designed this variation as five sections –*capriccioso* and I, *grave* and II, III, *scorrevole* and *coda*.¹⁹ *Capriccioso*, *grave* and *scorrevole*²⁰ also refer to the three basic thematic elements of this piece. These three main themes appear throughout the whole piece employing fragmentations or superimpositions. Reynolds used two computer algorithms (SPLITZ and SPIRLZ) to make transformations on these three thematic ideas. He cut the themes up into small fragments, and then recombined these fragments into a kind of altered mosaic. This process resembles his experiments on words: he disassembled words into elementary figures (dots, lines, etc.) and gathered them into new figures, i.e. new words.

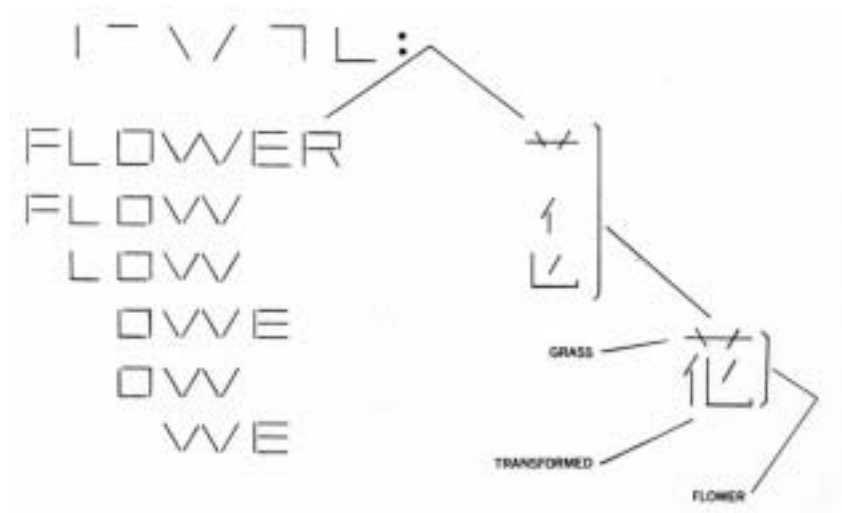
¹⁸ Composer's own words from the CD recording jacket, “Roger Reynolds: Personae, The Vanity of Words, Variation,” (1992)

¹⁹ Reynolds defined this structure at the performance notes in the first page of the score.

²⁰ “whimsical,” “weigh down” and “flowing.”

Example 1 shows the process of changing the word “FLOWER” into the Chinese letter that means “flower.”²¹

Ex. 1. Reynolds’ presentation of rearrangement of a word



3. Notation

It is not an exaggeration to say that the function of notation is the most significant factor for Reynolds in realizing his experimental conceptualism. For example, his very detailed score of the early theater piece *The Emperor of Ice Cream* (1961-2, rev. 1974) not only shows the rhythms and the volumes of the spoken text but also the positions and the moving-ranges at the stage for each performer by using diagonal dotted lines²² (Ex. 2). He also designed a multi-dimensional diagram for this music.

²¹ Roger Reynolds, *Mind Model*, New York, Praeger Publisher, 1975, 168.

²² Gann, *American Music in the Twentieth Century*, 170.

Ex. 2. Roger Reynolds, *The Emperor of Ice Cream*²³

The image shows a page of a musical score for Roger Reynolds' *The Emperor of Ice Cream*. It features a piano part on the left and a voice part on the right. The piano part includes staves for 'piano solo' and 'piano' with various performance instructions such as 'piano solo (see 4:11 break)', 'begin inflating paper sack', 'high steel whistles (see 4:11 break)', and 'free-stroke in 5/8 (for rag operetta)'. The voice part includes lyrics and performance directions like 'call the seller of big cigars' and 'cheer with ragged hands'. The score is annotated with circled numbers (1-5) and various musical notations including dynamics, articulation, and specific performance techniques.

In the *Fantasy for Pianist*, he used special notation for various tone clusters devised by a German-Argentine contemporary composer Mauricio Kagel (b.1931) (Ex. 3).

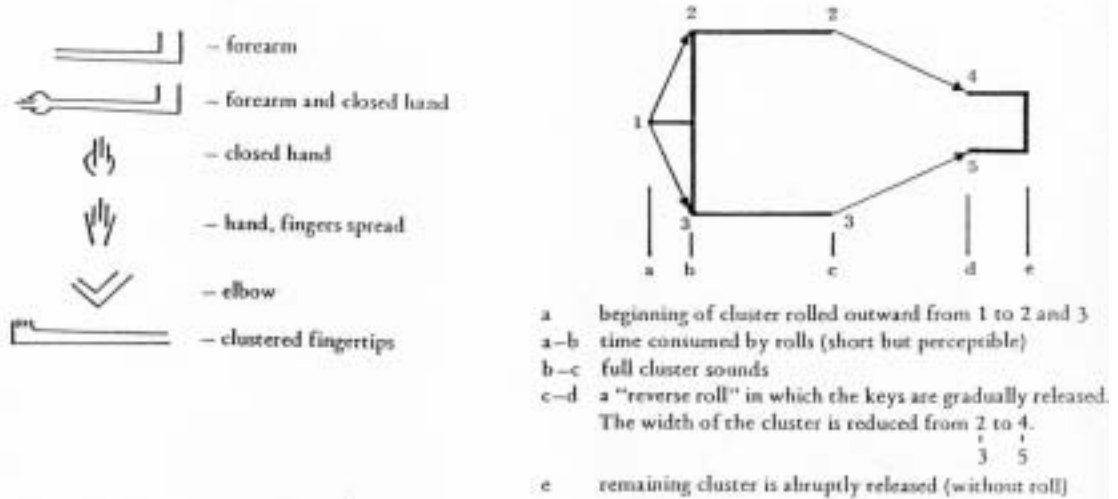
Also, very detailed instructions for playing on the piano string – playing in different touches, different numbers of the strings, etc. – were introduced (Ex. 4).

In *Variation*, the notation became much more conventional compared to the *Fantasy*. In this piece, Reynolds was more concerned with the various touches to the keyboard and the variety of the note values. Frequently, these instructions appear on the

²³ *Ibid.*, 171.

ornamental figures; for example, rolls are subdivided into three different speeds – fast, medium and slow, as well as the directions – up and down (Ex. 5).

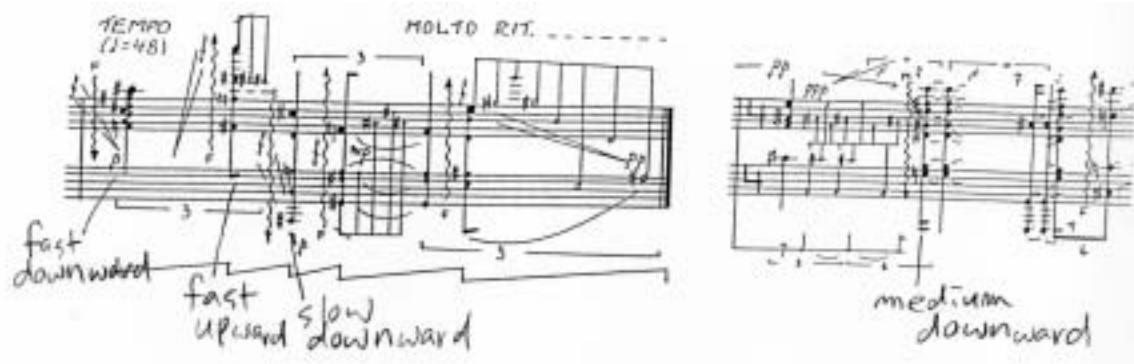
Ex. 3. Performance notes for clusters, *Fantasy for Pianist*



Ex. 4. Instructions for playing on the strings of the piano, *Fantasy for Pianist*, p. 10

Hold the 2 strings in random order, at least one must always be sounding
 expressive
 mf
 p
 pp
 Keep a cluster of spread strings steady with fingers. Do not allow the strings to tremble.
 mf
 Ground in triple strings. Repeat all 16 but steady.
 pp
 Improvise with fingertips, but always, as fast as possible.
 (pp-mp)
 Keep the order of all the 3 second strings with random/surprising strikes. Let strings tremble after strikes.
 mf
 Hold the 2 strings in random order, at least one must always be sounding.
 mf

Ex. 5. Roger Reynolds, *Variation*, special notation



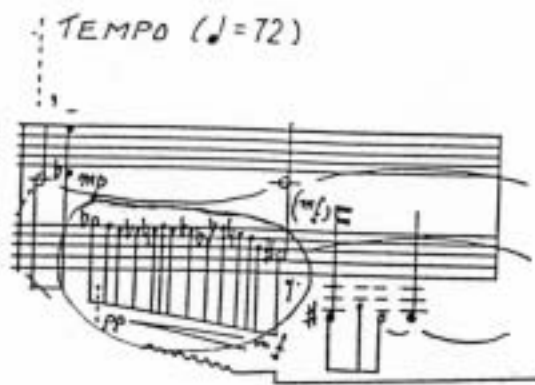
4. Ornamentation

The composer used various ornamental figures – long trills, fast repeated notes, arpeggios, and free ornaments – extensively in his piano music. With these ornamental textures, the performer can have the opportunity to show individual personality and emotion, along with rich sonority while using wide range of the piano. In *Fantasy*, the effect of ornaments was planned on visual origins – the four pictures of bare branches in the snow.

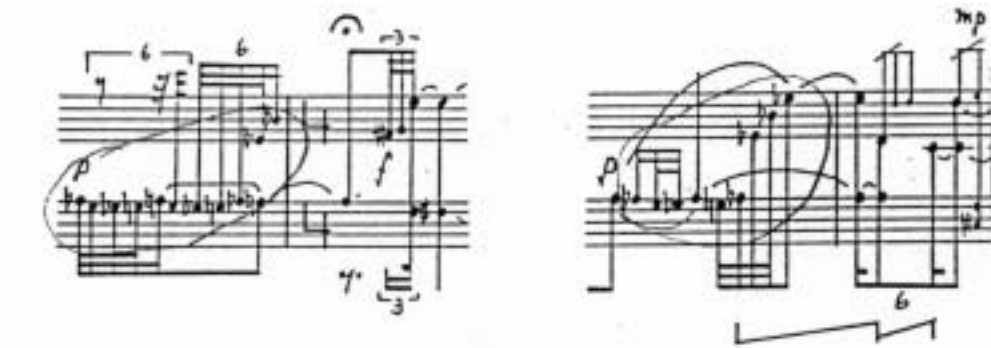
On the other hand, the ornaments in *Variation* have more function than sound effect: they make it possible to recognize the three themes. For instance, in the third measure of the first theme, *capriccioso*, a figure of free ornament which appears in the left hand, is appeared (Ex. 6). This figure reappears at measures 31, 42, 78, 116: this figure which appears at measure 31 and 116 preserves its original shape mostly; in measures 42 and 78, this figure employs some changes and the composer did not notate it as ornamentation, (i.e., small notes) (Ex. 7). As example 7 illustrates, Reynolds used

ornaments as a partial process of the variation in this piece: he divided a figure into smaller fragments and put the new elements together.

Ex. 6. Roger Reynolds, *Variation*, mm. 3

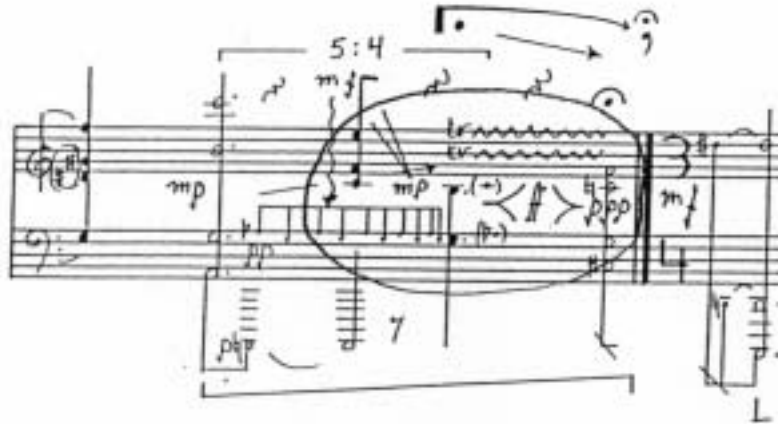


Ex. 7. Roger Reynolds, *Variation*, mm. 42 and mm. 78-79.



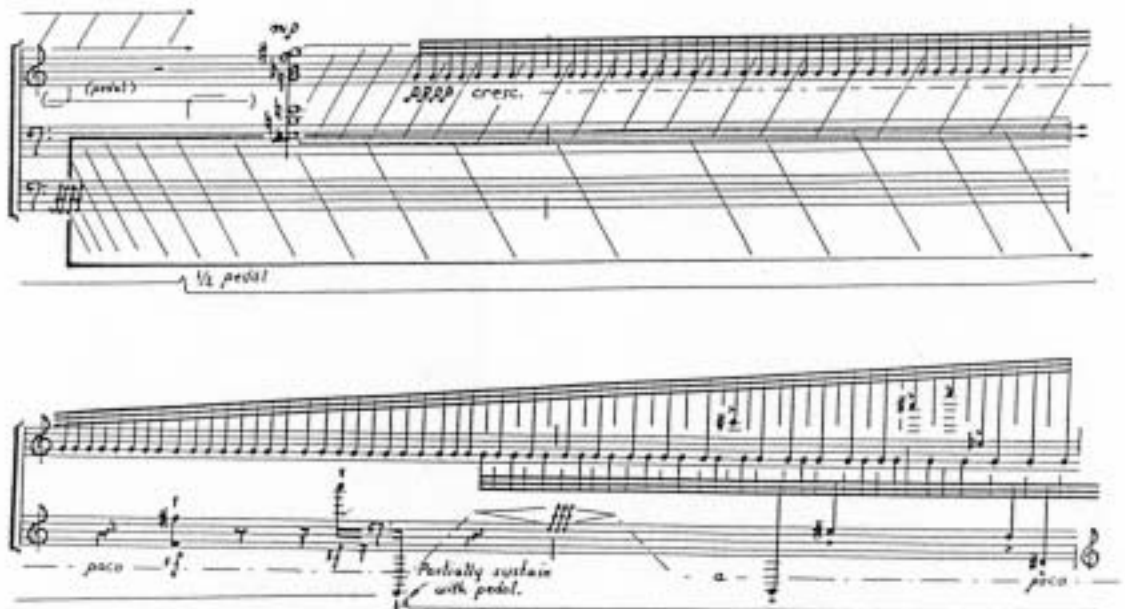
Other important ornamental figures in Reynolds' piano music are long trills and repeated notes. In *Fantasy*, the trills are used somewhat in a reserved manner compared to *Variation*. In *Variation*, the effect of the trill is much extended so it even can lead to the climax of this piece with these virtuosic trills and tremolos (Ex. 8).

Ex. 8. Roger Reynolds, *Variation*, mm. 309-310



Repeated notes are widely used in both piano pieces. This intensive sound effect can be a technical challenge for the performer because it usually appears with a big crescendo (Ex. 9).

Ex. 9. Long repeated notes with big crescendo, *Fantasy for Pianist*, mm. 52-53



CHAPTER III

VARIATION

“*Variation*, then, is a mobile of unusual breadth, within which arrays of musical shards constantly reform: obscuring, illuminating, linking, contradicting, informing, resonating.”²⁴

1. Main themes

The three themes²⁵ are quite long and represent the complexity of the texture already. The first theme, *capriccioso*, consists of fourteen measures; *grave* has eighteen measures; and *scorrevole* has twelve measures. These three titles represent the contrasting characters of each theme – whimsical, heavy and flowing. The composer designed *capriccioso* as linear, *grave* as chordal and *scorrevole* as figurative. In his early sketch, the conceptual evolution of thematic materials appears as: figurative → linear → chordal. This concept can be explained as gradual development of textural layers: the scattered figurative motive leads to the linear one; and then the line can be gathered into the thick chordal motive. In the early stage of the composition, he connects three themes in the order above and presents them at the beginning of the piece. Later he changes the order: linear → chordal → figurative, as well as the locations. So the *capriccioso* appears at first at the beginning of *Variation*, *grave* appears three pages after the

²⁴ Composer’s own words from the CD recording jacket, “Roger Reynolds: Personae, The Vanity of Words, Variation,” (1992).

²⁵ Reynolds called these themes “core” themes.

capriccioso and *scorrevole* appears almost at the end of this piece (right before the *coda*). Reynolds placed *capriccioso* at the beginning of this piece because he judged that “beginning with the linear material was more assertive than the relatively unformed essence of figurative.”²⁶

These placements are unique compared to traditional “theme and variations”: usually the themes appear before their variants²⁷; but in Reynolds’ *Variation*, the variants appear before the themes’ presentation. As a result of this, listeners can hear “foreign” materials when the fragments of the themes recur in the variation process. This tendency is most strong in the case of the recurring third theme, *scorrevole*, whose fragments start to appear on page 3 while the original theme appears almost at the end of the piece (page 18). Another problem for the listener in identifying the theme is the complex texture of the themes. Traditionally, composers chose simple themes so the texture could become more and more complex when the variations “developed.” In Reynolds’ *Variation*, because of the composer’s unique attempt to create a patchwork, the themes were composed in a complete manner instead of leaving some possibilities to develop. Thus the borderline between theme and variations becomes very vague for listeners in a sense of “traditional” concept; as a result of this, *Variation* can be defined as one whole piece rather than themes and multiple sections of variations. Reynolds said transformations of the themes occur only by changing the relationships of them – in other words, the whole piece is a statement of themes and connective passages which transform them.²⁸ (But some ornamental figures, e.g. trills, still present the tendency of developing – they appear as longer, more dramatic versions of variants as the variation progresses).

²⁶ Roger Reynolds, *Form and Method: Composing Music*, New York, Routledge, 2002, 43.

²⁷ For example, Haydn’s *Piano Variation in f minor* Hob. XII: 6, which has two themes.

²⁸ From the interview with the composer, May 2003.

Example 10 is the twelve-tone row chart for *Variation* which the composer presented in his book *Form and Method*. The black notes are the first hexachord he used and the white notes are the second. With these manipulations, those different combinations of hexachords can produce various sound effects from dissonance to sonorities containing harmonic emphases.

Ex. 10. The row chart for *Variation*²⁹

The image displays a musical score for a twelve-tone composition. It consists of ten staves of music. The first staff contains a sequence of notes, with some notes marked with black stems and others with white stems. Below the first staff, there are two rows of numbers: the first row contains '1 2 1 3 1' and the second row contains '1 1 3 3 1'. The rest of the score shows various manipulations of the twelve-tone row, including inversions and retrogrades, across the ten staves. The notes are organized into measures, with vertical dashed lines indicating bar boundaries.

²⁹ Reynolds, *Form and Method: Composing Music*, 54.

Ex. 11. The three themes of *Variation*

Figurative

♩ = 96
SCORREVOLE

This musical score for the 'Figurative' theme is written for piano. It begins with a tempo marking of quarter note = 96 and the instruction 'SCORREVOLE' (rushing). The score consists of four systems of music. The first system includes a 'CONTRAFASO' section. The second system includes a 'PEDAL' section. The music is characterized by intricate rhythmic patterns, including sixteenth and thirty-second notes, and features various dynamic markings such as *pp*, *mf*, and *ff*. The notation includes many slurs and phrasing marks, indicating a highly detailed and expressive piece.

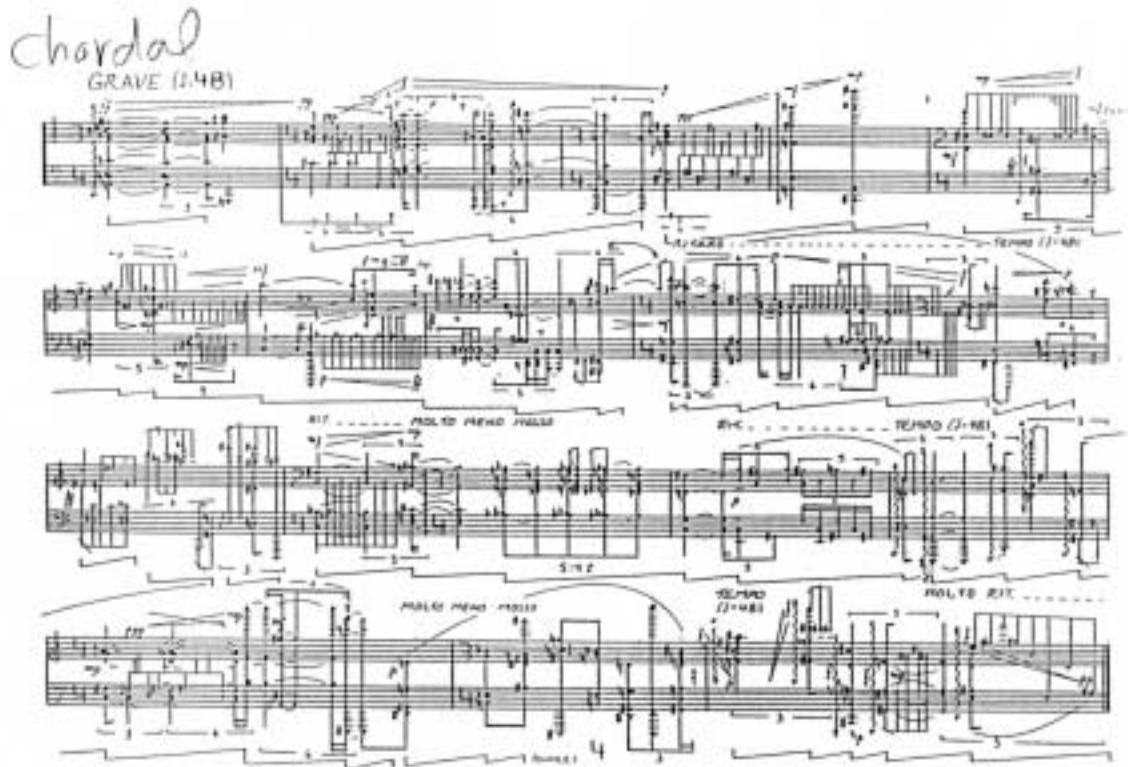
Linear

CAPELLICIOSO
1-72

VARIATION

Roger Reynolds

This musical score for the 'Linear' theme is also for piano. It starts with the tempo marking 'CAPELLICIOSO' and the number '1-72'. The title 'VARIATION' is prominently displayed, along with the composer's name 'Roger Reynolds'. The score is divided into three systems. The first system includes a 'Ritard.' (ritardando) section. The second system includes a 'Ritard.' section. The third system includes a 'Ritard.' section. The music is more melodic and structured than the 'Figurative' theme, with clear phrasing and dynamic markings such as *pp*, *mf*, and *ff*. The notation includes many slurs and phrasing marks, indicating a highly detailed and expressive piece.



2. Two algorithms

Reynolds used computer algorithms to produce raw fragments of the themes. Both SPIRLZ and SPLITZ are applied to cut the themes into small segments and rearrange them. SPIRLZ cuts the subject in a regular size (in music, the amount of time) from the center to the outer edge in a spiral or cyclic motion. The composer determines the timing of each note from the original subject before starting this process so he can point out where to start this algorithm; also the duration and the location of the first sample is pre-determined. This algorithm automatically produces the sample with pre-determined note value and gradually reduces the value from the second cycle: one cycle finishes until the cutting process reaches its extreme (end or beginning of the subject). On the contrary, if

the process is reversed, the note value expands. The output from this algorithm is monophonic and continuous. Ex. 12 presents the transformed figure of the linear theme (*capriccioso*) by using SPIRLZ, which appears at page 5. In this case, the composer starts the process from the moment of 32.1 seconds of the theme. The duration of the quarter note is 0.74074 seconds at the situation of MM 81 equals a quarter note: thus the sixteenth note is 0.1852 seconds long. Reynolds used 0.19 seconds for the sixteenth notes in the process. So he sampled out the amount of 0.19 seconds value from the theme. In addition to this, he applies the reverse process so the note values are getting larger from sixteenth notes to eighth notes, and eighth notes to quarter notes. The composer mediated a great amount to reach the final version of this effective dance or march-like section from the primitive fragments.

Another method Reynolds used is the SPLITZ algorithm which produces polyphonic outputs. This algorithm slices the subject into a prescribed number of fragments (always an odd number, e.g., 13, 27 and so on) by a sequence of numbers called a “proportional series” which indicates the proportional sizes of each segment. This can be a symmetrical series like [1, 1, 2, 2, 3, 4, 4, 4, 3, 2, 2, 1, 1], but it does not have to be. (The numbers of fragments and the design of the proportional series is predetermined by the composer). Then the segments can be named like [a, b, c, d, e, f, g, h, i, j, k, l, m] in the case of thirteen segments. The re-arrangement process is as follows: the odd segments (a, c, e, g, i, k, m) are presented in chronological order; the even segments (b, d, f, h, j, l) are presented in reverse chronological order; in between each segment, interspersed silences are inserted, which gradually enlarge their sizes in both directions (odd and even). Thus, this process results in a discontinuous series of fragments, which

is opposite to the results from SPIRLZ. Example 13 is the graphic presentation of this process.

Ex. 12-1. The linear theme

The image shows a handwritten musical score for a piece titled "VARIATION" by Roger Reynolds. The score is written on three staves. At the top left, it says "CAPRICCIOSO" and "1 = ca. 72". At the top right, it says "Roger Reynolds". The word "VARIATION" is written in large letters in the center. There are several annotations: "RITARD." (ritardando) and "RITARD. INCREMENTALE" (ritardando incrementale) are written above the staves. "A TEMPO" is written below the staves. There are also some circled notes and lines. At the bottom of the score, there are several numbers: 4, 8, 5, 6, 1, 3, 7, and 2. These numbers are connected to specific notes or measures in the score by lines.

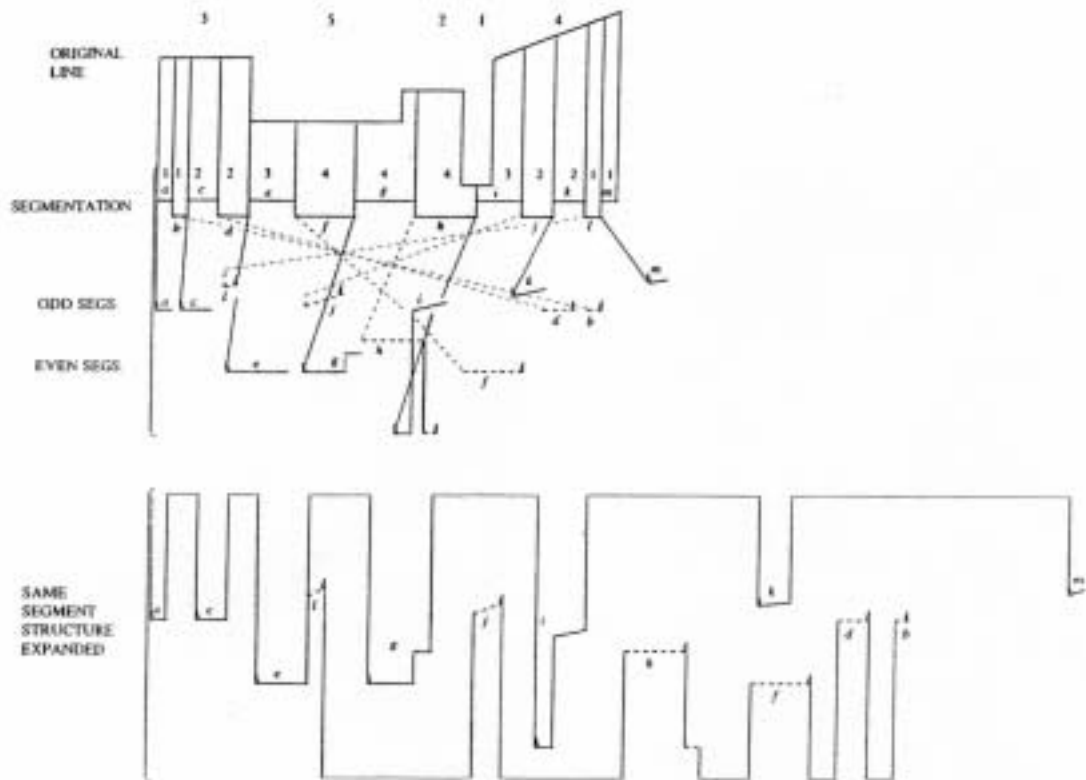
Ex. 12-2. The transformed section by using SPIRLZ (mm. 72-74)³⁰

The image shows a handwritten musical score for a transformed section. It is written on two staves. At the top left, it says "1 = ca. 81". At the top center, it says "RITARD.". The score consists of a sequence of notes and rests. At the bottom of the score, there are several numbers: 1, 2, 3, 4, 5, 6, 7, 8. These numbers are connected to specific notes in the score by lines.

³⁰ The numbers marked in example 12-1 correspond to the numbers in example 12-2.

When Reynolds applied this process in *Variation*, he combined more than one theme. He crossed many layers of fragments in order to produce very complex polyphonic lines. Example 14 represents one page of the sketch for this process. The two middle big staves are the actual result after the mediation from the raw fragments, which appear at the smaller staves.

Ex. 13. Graphic presentation of SPLITZ³¹



³¹ Reynolds, Form and Method, 75.

Ex. 14. Mixing and mediating process of SPLITZ fragments, *Variation*, mm. 27-29³²

Reynolds applied these algorithms to increase the possibilities of choices. Even though the algorithmic processes are autonomous, the last choices are in the hands of the composer: He chose the series or the combinations of the fragments as the music required or as the composer's intuition judged; this aspect is very similar to the process of composing aleatoric or chance music, although the performer does not have to choose what to play in this case.

³² *Ibid.*, 81.

Example 18 is the table of sectional identifications of the themes. This table is based upon the “formal plan” drawn by the composer. This plan indicates the appearance of the areas where SPIRLZ and SPLITZ were applied to the three themes.³³ Due to the difficulties of applying this plan to the actual performance, this author drew a new chart according to the measures’ progress. “A” indicates the first theme, *capriccioso*, “B” is *grave* and “C” indicates *scorrevole*. The transformed section which used the SPIRLZ algorithm is marked as A', B', and C'. And A'', B'', C'' indicates the section which used the SPLITZ.

³³ Even though Reynolds indicated very detailed information on this plan, its practical application for the performance is difficult because of the different metronome markings of the three themes and each section compared to the final version – MM 54, 81, 109 equal quarter note versus MM 48, 72, 96 – though both are in the same ratio of 2: 3: 4. And using the time marking instead of measure or section marking – which is very important to track the progress of this variation – is not realistic for the performance of the final version. This author assumes that the composer might have designed this plan at the early stage of composition.

Ex. 15. Table for appearances of the themes

Measure Numbers	1-13	14-17	18-29	30-53	54-71	72-84	85-114
Indications of the Themes	A		B'	A''	B	A'	
		C''	C''	C''			C''
Sections	Linear Theme (<i>capriccioso</i>)	I	I	I	Chordal Theme (<i>grave</i>)	II	II
Metronome Markings (MM = ♩)	72	48	54, 48	48	48	81, 72, 60	96

115-123	123-127	128-144	145-171	172-187	188-206	199-207	208-220
A''	A''	A''	A''	A''			A''
		B''	B''		B''	B''	B'
	C''	C''		C''	C''		C''
II	II	II	II	II	II	II	III
60, 72	81	72	60, 72	96	96	48	72, 108, 96

221-224	225-242	243-249	250-290	291-308	309-320	321-337
A''	A''	A''	A''	A''		A''
B'	B'	B'	B'	B'		B'
	C''		C''		C	
III	III	III	III	III	Figurative Theme (<i>scorrevole</i>)	Coda
81	96, 48, 96	96	81, 96	48	96	96

3. Challenges in performance

As David Stein pointed out in his dissertation “The Performance of Twelve-Tone and Serial Music for the Piano” (1965), performing serial compositions for the piano challenges the pianist with several technical difficulties: first, rapid jumps in between the extreme ranges of the keyboard due to the octave displacement of the tone row; second, precise control of widely ranged touches and dynamics on very small sizes of note groups in which the sound fluctuates continuously; third, complex rhythms – these irregularly subdivided rhythms require the performer to develop an exquisite sense of rhythm.³⁴ These challenges occur even more strongly in Reynolds’ *Variation* than in earlier twelve-tone compositions of the Second Viennese School. Reynolds designed this piece as very complex layers (he compared the texture to “dizzying weaves”) that resulted in rich sonorities by using broad ranges of the piano, instead of the economical sound of the tone row, while maintaining the tendency to pointillism, i.e., concentrating an effect on each note. The technical demands are greatly extended due to the combined necessity for both brilliance and intensity. Even though the composer refined his raw fragments in order to write more idiomatically for the piano, still the complexity of the textures accompanied by the irregular rhythmic motions are not easy to play in many cases.

There are several approaches for the performer to take in order to solve these problems. The first step is to arrive at the most effective fingerings and alternations of the hands. Second, it is important to solve the relationship between ornaments and non-ornamental figures. This is similar to many cases in tonal music – the ornamental figures should be played lighter in order not to interfere the main line. Third, identification of

³⁴ David Stein, The Performance of Twelve-Tone and Serial Music for the Piano, D.M.A. dissertation, University of Southern California, 1965, 170.

each theme is necessary to keep integrity of the fragments, respecting the composer's intention to form a "kaleidoscopic" mosaic. Some of the fragments sliced by SPLITZ are easy to identify but some are not because of the different locations where the fragments sampled out. (When SPILRZ is applied, the degree of transformation is greater and more regular than SPLITZ because of the "monophonic" process of this algorithm.) However, the performer should be acquainted with the fact that these complicated textures become new sound effects.³⁵

4. Conclusion

Reynolds experimented with a new method of writing variations by using autonomous devices that provided infinite opportunities of choices, accompanied with a very detailed pre-plan. This is one of many examples of the composer applying experimental concepts to the traditional genre, i.e., opera, symphony. Using new methods naturally leads to a new kind of form. In the case of *Variation*, the variants appeared as micro-size fragments while they mixed together continuously creating different features at every moment, like weaving colorful strings in different ways to make a long tapestry. Like composers of variations throughout history who were challenged to unify repetitive materials, Reynolds attempted a whole new kind of unified form of variation. And this new form resulted in the production of many delicately different sound effects and colors.

For the performance of this piece – in other words, re-creating the process of the composition, certain aspects are critical to the understanding of these new concepts and

³⁵ This aspect is somewhat similar to the case of "mystic chord" invented by Alexander Scriabin, which served as sound effect rather than functional harmony.

the compositional process. First, the performer should recognize where the transformations occur and keep in mind that the mixing process itself is the transformation. Second, a spontaneous approach is necessary even though all the notes have been pre-determined, because of the composer's aleatoric tendency when he chose each fragment from an infinite number of choices.

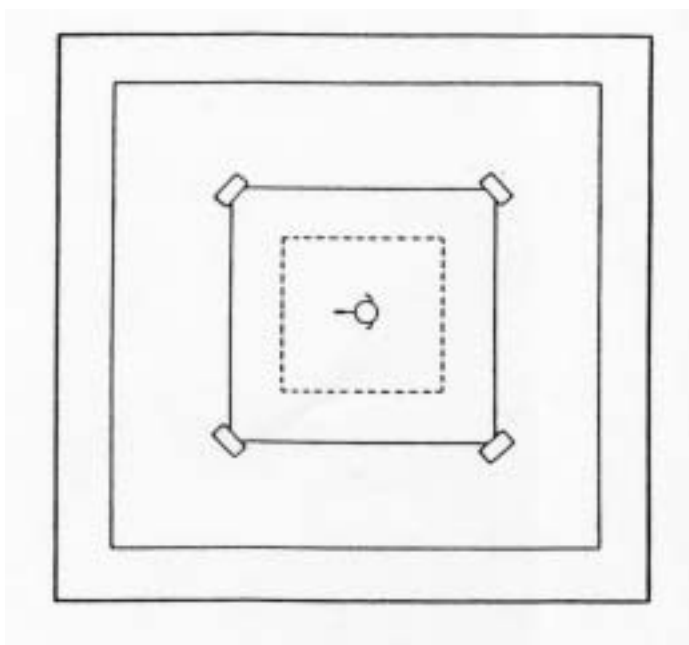
Reynolds' *Variation* is worth mentioning as a major large-scale twentieth-century piano repertoire because of its innovative aspects based on the most important traditional factor of the variation – unification.

APPENDIX

SUPPLEMENTARY INFORMATION ABOUT “SOUND PATHS AND SPACE FUNCTIONS”

In Reynolds’ article “Some Thoughts on Sound Movement and Meaning,” Reynolds introduced a basic diagram for “spatial sound” (Ex. 1).

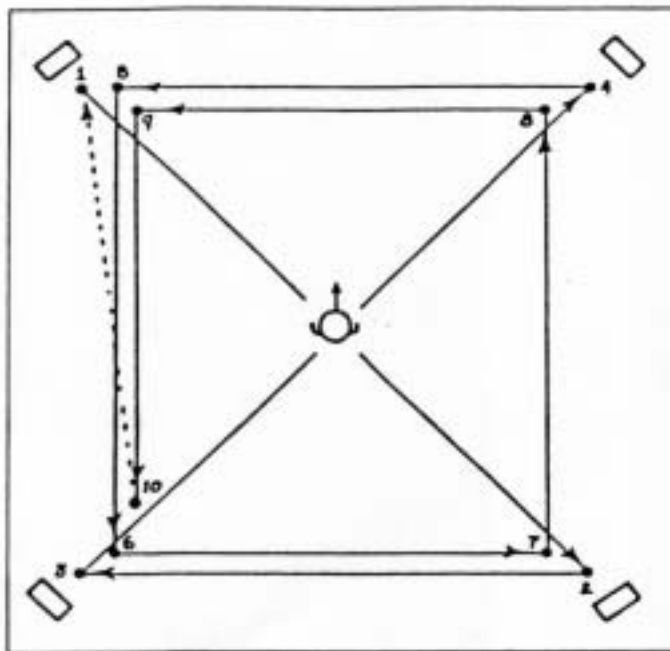
Ex. 16. Reynolds’ listener diagram³⁶



³⁶ Roger Reynolds, “Thoughts on Sound Movement and Meaning,” *Perspectives of New Music*, Spring-Summer 1978, 189.

According to the composer's instruction: "The solid inner line marked by rectangles at the corners represents a normative space enclosed by four speakers; the listener's central position and orientation are not arbitrary; the innermost dotted line suggests close proximity and/or reduced enclosure size; the second solid line, distance and/or spacious enclosure; the outermost border, the limits of audibility (either because of distance or reduced intensity)."³⁷ With these principles, he designed the "sound path" and "space functions" of *Still [Voicespace I]* (Ex. 2).

Ex. 17. *Still*: Sound paths and space functions³⁸

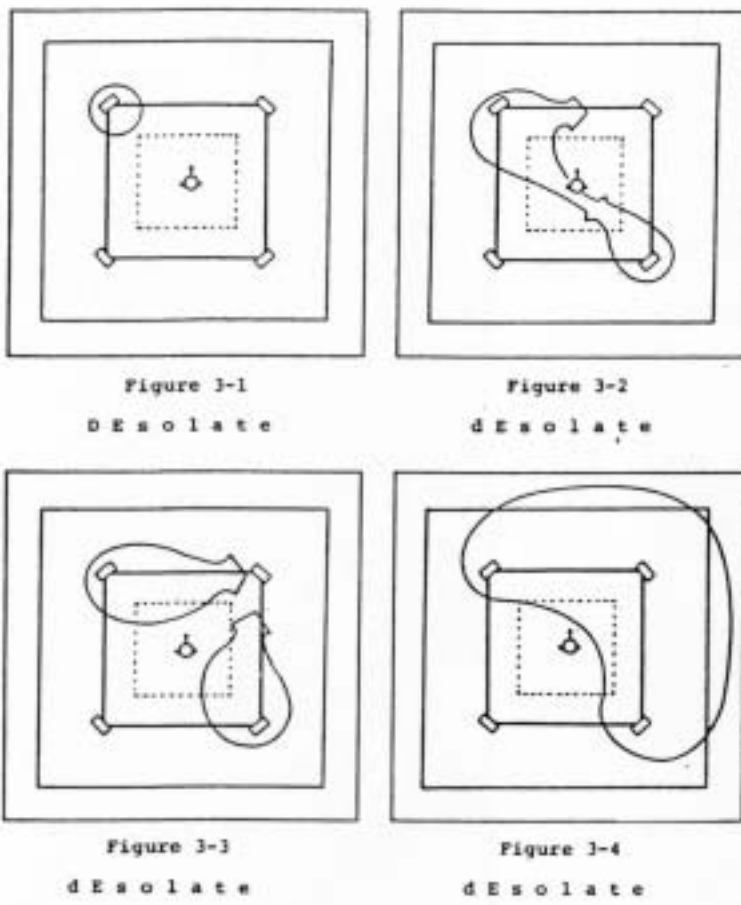


³⁷ Ibid., 188.

³⁸ Roger Reynolds: Profile as a Composer, 11.

He indicated the order of the sound locations projected by four speakers with numbers and it can be comprehended easily with diagrams below. It appears as though he indicated the first four or five steps of the sound projection (Ex. 3).

Ex. 18. *Still*: Diagrams for sound paths and space functions³⁹



³⁹ Ibid., 15.

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