

THREE TWENTIETH-CENTURY AMERICAN PIANO DUETS:
A STUDY OF WORKS BY
MORTON FELDMAN, RICHARD FELCIANO, AND GEORGE CRUMB

by

WOOYOUNG ELLIE CHOI

(Under the Direction of David Schiller and Evgeny Rivkin)

ABSTRACT

The purpose of this study is to provide pedagogical materials and interpretive suggestions for three piano duets by American composers: Morton Feldman's *Piano Four Hands*, Richard Felciano's *Gravities*, and George Crumb's *Celestial Mechanics (Makrokosmos IV)*. Chapter 1 provides an overview of the three selected compositions and a review of relevant literature. Chapters 2 through 4 provide specific performance guidance and pedagogical suggestions. Chapter 2 investigates the aleatoricism of *Piano Four Hands*, discussing various interpretations by several performers. Chapter 3 explores the pedagogical challenges found in *Gravities*, focusing on its rhythmic complexity. Chapter 4 examines *Celestial Mechanics (Makrokosmos IV)* within the broader context of Crumb's use of extended techniques and unusual timbres, and his interest in theatricality.

INDEX WORDS: Feldman, Felciano, Crumb, Piano, Piano duet, Piano Four Hands, Gravities, Celestial Mechanics, Aleatoricism, Extended technique, American music, Twentieth-century music

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DEDICATION

I would like to dedicate this dissertation to my wonderful parents, Hee Sook and Moon Heon Choi, my brother, Jae Joon, and my sister, Seung-eun. They have provided invaluable support throughout my studies in music. This dissertation would not have been possible without their endless encouragement and patience.

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CHAPTER 1: INTRODUCTION

Overview

This document provides a study of three American piano duets composed in the second half of the twentieth century. The compositions examined are *Piano Four Hands* by Morton Feldman (1958), *Gravities, for piano four hands* by Richard Felciano (1965), and *Celestial Mechanics (Makrokosmos IV)* by George Crumb (1979). Feldman, Felciano, and Crumb were selected for a comparative study because they all employ avant-garde and experimental compositional techniques, but they are nevertheless stylistically distinct. The compositions themselves are also stylistically diverse and span approximately two decades from the late 1950s to the late 1970s.

Although many nineteenth-century composers and pieces exploited the piano-duet idiom quite creatively, the romantic literature for piano duet also included countless arrangements of symphonies, chamber music, and opera excerpts. At the same time it provided a valuable pedagogical tool and a very popular type of recreational music making.

In contrast, it seems that a number of twentieth-century composers, including those who are the subject of this study, have “re-invented” the medium specifically to explore new musical ideas. This treatment of the piano duet medium in ways that might be considered avant-garde is a twentieth-century phenomenon.

The first piece to be discussed is *Piano Four Hands* (1958) by Morton Feldman (1926–1987). It was published in 1962 by C. F. Peters.¹ Thomas DeLio states that “the music of Morton Feldman constitutes one of the most remarkable explorations of the twentieth century.”² DeLio writes, “Rejecting the most basic tenets of conventional musical discourse, [Feldman] moved toward a creative stance in which sounds appear to move freely in time and space without the interference of any compositional rhetoric or *a priori* procedures.”³

Piano Four Hands by Morton Feldman is marked “slow, very soft,” and “durations are free for each player.” It features soft and slow-moving single sounds, notated with stemless black note heads. Although it is otherwise in traditional notation, this piece is aleatoric, with a high degree of rhythmic indeterminacy. Therefore, this music requires a different rehearsal technique than traditional repertoire. Both the primo and the secondo players need to understand the overall sound of the work and learn to collaborate within unpredictable circumstances.

Richard Felciano (b. 1930) composed *Gravities* in 1965, and it was published in 1974 by the Schirmer Music Company.⁴ Milton and Peggy Salkind commissioned it and premiered it on May 17, 1976. *Gravities* demands that both players have an advanced understanding of rhythm in order to produce rhythmic precision and accuracy. As discussed below on p. 30 ff., some of Felciano’s rhythms are related to Hispanic and Latin dance rhythms. In addition, as Frank Dawes states, “For a full realization of its sonorities, *Gravities* needs a third pedal and two highly professional pianists.”⁵ Dawes’s emphasis on sonority is consistent with Felciano’s on-going interest in exploring the widest possible variety of electronic and acoustic sounds.

¹ Morton Feldman, *Piano Four Hands* (New York: C. F. Peters Corporation, 1962).

² Thomas DeLio, ed., *The Music of Morton Feldman* (Westport, CT: Greenwood Press, 1996), 39.

³ Ibid.

⁴ Richard Felciano, *Gravities* (Boston, MA: E. C. Schirmer Music Company, 1974). Many of Felciano’s compositions, including *Gravities*, are currently available in pdf format on his website, www.richardfelciano.com.

⁵ Frank Dawes, “Four Hands,” *The Musical Times* 117, no. 1597 (1976): 240–241.

Celestial Mechanics (Makrokosmos IV) (1979) by George Crumb (b. 1929), for amplified piano (four hands), consists of four movements. It was premiered by Gilbert Kalish and Paul Jacobs at Alice Tully Hall in New York City on November 18, 1979, and published in the same year by C. F. Peters.⁶ George Crumb provided the following comment in the program notes.

My sole departure from tradition occurs at two points in the score where I have enlarged the medium to six-hands; and so, in the whimsical manner of Ives, the page turner must contribute more substantively to the performance than is his wont.⁷

Crumb's insistence that *Celestial Mechanics* fits comfortably within the four-hand tradition is intriguing, but slightly misleading. The piece explores unusual timbres and demands extended pianistic technique. As in a number of his other works, Crumb requires both pianists as well as the page turner to produce sounds by direct manipulation of the piano strings, instead of or in addition to striking the keyboard. As a technically demanding piece utilizing extended performance techniques, *Celestial Mechanics* is a valuable addition to the contemporary piano duet repertoire.

Purpose of the Study

This dissertation focuses on the stylistic, technical, and pedagogical challenges found in the three works listed above. It intendeds to offer pianists and piano teachers a deeper understanding of the piano duet as it evolved in the broader context of mid-twentieth-century American piano literature. Specific topics that will be addressed include aleatoric compositional technique, emphasis on registral and rhythmic possibilities, and the use of extended piano techniques characteristic of the medium. Suggestions regarding such technical matters as

⁶ George Crumb, *Celestial Mechanics (Makrokosmos IV)* (New York: C. F. Peters Corporation, 1979).

⁷ Ibid.

fingering, pedaling, redistribution of the hands, voicing, etc., are also provided when pedagogically relevant.

Review of the Literature

The literature reviewed for this study falls into four basic categories: 1) general studies of the piano duet as a genre; 2) studies of Morton Feldman's music; 3) studies of Richard Felciano's music; and 4) studies of George Crumb's music. While the emphasis is on the piano duet as a genre, studies of other works by these composers were also consulted when they discussed stylistic traits relevant to the present study.

The Piano Duet as a Genre

Among the many studies of the piano duet as a genre listed in the bibliography, the following are especially relevant to the stylistic and pedagogical concerns of the present study.

Howard Ferguson's *Keyboard Duets from the 16th to the 20th Century for One and Two Pianos* is a reference guide to numerous works for piano duet.⁸ It has three main sections. Chapter 1 presents a chronology of piano duets from the sixteenth century to the present day. Chapter 2 deals with special techniques for the piano duet, and Chapter 3 provides selective repertoire for piano duet. Ferguson's discussion of hand position and fingering, dynamics and tonal balance, and redistribution of parts in the piano duet is relevant to the present study.

Frederic Ming Chang and Albert Faurot's *Team Piano Repertoire* is a manual of music for multiple players at one or more pianos. This book deals with team piano repertoire including two people at one piano, two at two pianos, and four at four pianos, arrangements and

⁸ Howard Ferguson, *Keyboard Duets from the 16th to the 20th Century for One and Two Pianos* (New York: Oxford University Press, 1995); see especially pp. 29–34.

transcriptions, and recordings. Each entry has a brief description regarding formal and technical aspects. Special rehearsal techniques for the piano duet addressed in this book provide useful information for the present study.⁹

Pricilla Jefcoat's dissertation, "Intermediate Piano Duets by American Composers Published between 1960 and 2000: A Selected Annotated Bibliography," provides annotated listings of intermediate four-hand piano music organized around specific technical and musical pedagogical goals. As Jefcoat states, pieces that require twentieth-century technique are somewhat underrepresented in this intermediate literature. The present study will assist teachers and students in addressing this gap as the students progress to more advanced stages in their studies.¹⁰

Hans Moldenhauer's *Duo-Pianism* addresses the history and literature of the piano duet.¹¹ This book deals with partnership, practicing, mechanics and aesthetics, program building, and the performance of piano duets. These essential aspects of playing piano duets remain relevant to the present study.

Morton Feldman

Morton Feldman is recognized as one of the most stylistically innovative of twentieth-century American composers, and studies of his music are numerous. Among those most relevant to the present study are the following.

The Music of Morton Feldman, edited by Thomas DeLio, provides detailed analyses of works, including *Last Pieces, No. 3* (1959), in which Feldman uses compositional techniques

⁹ Frederic Ming Chang and Albert Faurot. *Team Piano Repertoire* (Metuchen, NJ: The Scarecrow Press, 1976).

¹⁰ Pricilla Jefcoat, "Intermediate Piano Duets by American Composers Published between 1960 and 2000: A Selected Annotated Bibliography," D.M.A. diss., University of Georgia, 2001, p. 205.

¹¹ Hans Moldenhauer. *Duo-Pianism* (Chicago: Chicago Musical College Press, 1950).

similar to those in *Piano Four Hands*.¹² It offers a number of insights into Morton Feldman's compositional approach that are also applicable to *Piano Four Hands*.

David Cope's *New Directions in Music* surveys avant-garde and "post-avant-garde" music in the twentieth century. Cope writes, "The concept of *time* provides an essential ingredient in the contemporary composer's approach to improvisation."¹³ Chapter 5 provides useful information about indeterminacy found in the works of several composers including Feldman.

Kyle Gann's *American Music in the Twentieth Century* provides a historical survey, organized by decades.¹⁴ Gann focuses on the compositional styles of several composers chosen to represent each decade. Chapter 6 examines John Cage and the New York School and includes information about Morton Feldman and his compositional style. It provides a valuable contribution to the study of Feldman's music.

Perspectives on American Music since 1950, edited by James R. Heintze, is a collection of essays about American music in the second half of twentieth century. Chapter 3, by Louis Goldstein, is titled "Morton Feldman and the Shape of Time." In this chapter, Goldstein discusses "how disparate influences—painters' techniques, 'irregular symmetrical' patterns woven in Asian rugs, and the concept of time—may have helped free Morton Feldman from using predictable and controlled elements in his compositions, thereby enabling him to rely on his sense of instinct."¹⁵ Goldstein's statement offers a useful insight on interpretation of Feldman's *Piano Four Hands*, in which durations are free for each player.

¹² DeLio, *The Music of Morton Feldman*.

¹³ David Cope, *New Directions in Music* (IA: Wm. C. Brown Communications, Inc., 1993), 130.

¹⁴ Kyle Gann, *American Music in the Twentieth Century* (NY: Schirmer Books, 1997).

¹⁵ Louis Goldstein, "Morton Feldman and the Shape of Time," in *Perspectives on American Music since 1950*, ed. James R. Heintze (NY: Garland Publishing, Inc., 1999), 73.

Richard Felciano

According to Cameron McGraw, “[Richard Felciano] has been cited for his originality, the elegance of his sonorities, and his exceptional talent in combining the utterances of conventional orchestral instruments with electronic sounds.”¹⁶ However, in contrast to such better known electronic/acoustic works as *Linearity* and *Glossolalia*, *Gravities* employs only one piano and conventional performance means. The following studies of Felciano’s compositional technique, not all of which address his piano works directly, have been especially relevant to the concerns of the present study.

The review of *Gravities* by Frank Dawes in *The Musical Times* (1976) provides useful insights and performance suggestions. Dawes writes, “*Gravities* is a short work with a static middle section (static in all respects—melodic, harmonic, rhythmic) in sharp contrast to the brilliant surface activity of the flanking sections.”¹⁷ William Braun’s article, “Expanding the Repertoire: Avant-Garde for School Choir,” discusses ways in which school choirs can benefit from the study of avant-garde repertoire.¹⁸ Richard Felciano’s *Cosmic Festival*, written for unison voices and electronic tape sound is reviewed. Braun’s approach to the pedagogy of avant-garde music is relevant to the present study.

Richard Felciano’s *Five Short Piano Pieces* is discussed in a review by George Fisher in the *Quarterly Journal of the Music Library Association* (1997). It provides useful information about Felciano’s compositional techniques and addresses some relevant technical issues. George Fisher states that the fourth piece, *Drums*, features “an admirable sensitivity to registral quality,

¹⁶ Cameron McGraw, *Piano Duet Repertoire: Music Originally Written for One Piano, Four Hands* (Bloomington: Indiana University Press, 1981), 83.

¹⁷ Dawes, “Four Hands,” 240–241.

¹⁸ William Braun, “Expanding the Repertoire: Avant-Garde for School Choir,” *Music Educators Journal* 74, no. 8 (1988): 46–51.

interplay between the hands, and the juxtaposition of regular and irregular rhythmic groups.”¹⁹
These features are also present in *Gravities*.

George Crumb

George Crumb’s musical style is characterized by frequent use of extended vocal and instrumental techniques intended to serve his expressive and dramatic aims. The following studies of his piano music are especially relevant to the concerns of this study.

Hyangmee Kim’s recent dissertation, “A Performer’s Guide to George Crumb’s *Makrokosmos IV (Celestial Mechanics)*,” presents a detailed, but narrowly focused, explanation of Crumb’s performance indications in the score. While Kim’s document provides a clear summary of the composer’s intentions in the work, the present study is concerned primarily with helping pianists—students and teachers alike—realize these intentions.²⁰

George Crumb: Profile of a Composer, compiled and edited by Don Gillespie, provides useful information about Crumb and his compositions.²¹ Various authors examine Crumb’s music and the volume includes numerous musical examples. An appendix includes a listing of reviews, recordings, and performances of *Celestial Mechanics*.

David Cohen’s *George Crumb: A Bio-Bibliography* is a comprehensive study of Crumb, providing biographical information, stylistic analysis, and a bibliography.²² It includes information about books, articles, and performance reviews of *Celestial Mechanics*.

¹⁹ George Fisher, “Music Reviews: Various Leaves: A Collection of Brief Pieces for Piano by Contemporary American Composers,” *Quarterly Journal of the Music Library Association* 53, no. 4 (1997): 1334–1336.

²⁰ Hyangmee Kim, “A Performer’s Guide to George Crumb’s *Makrokosmos IV (Celestial Mechanics)*,” D.M.A. diss., University of North Texas, 2008.

²¹ Don Gillespie, ed., *George Crumb: Profile of a Composer* (New York: C. F. Peters, 1986).

²² David Cohen, *George Crumb: A Bio-Bibliography* (Westport, CT: Greenwood Press, 2002).

Two important dissertations examine extended piano techniques found in George Crumb's piano music. Nell Wright Matthews's "George Crumb's *Makrokosmos Volumes I and II: Considerations for Performance, Including Observations by David Burge, Robert Miller and Lambert Orkis*" provides a valuable performance guide to extended piano techniques involved in performing *Makrokosmos Volumes I and II*. Matthews discusses musical influences on Crumb, examines extended piano techniques, and includes interviews with the three distinguished pianists named in the title of his dissertation.²³ Kenneth Neal Saxon's dissertation "A New Kaleidoscope: Extended Piano Techniques, 1910–1975" surveys the development of extended piano techniques in twentieth-century piano compositions, including George Crumb's *Makrokosmos Volumes I and II*.²⁴

Need for Study

Given the context of the preceding literature review, the present study will fulfill a need for a more detailed examination of the modern virtuosic American piano duet as an innovative extension of the medium. Further, it will present information on these three duets in a way that makes them more accessible to interested students, teachers, and performers.

Delimitation and Scope

The delimitations of this study are provided by the medium of the piano duet, and by the three composers selected for study, all of whom belong to the same generation of American

²³ Nell Wright Matthews, "George Crumb's *Makrokosmos Volumes I and II: Considerations for Performance, Including Observations by David Burge, Robert Miller and Lambert Orkis*," D.M.A. diss., University of Oklahoma, 1981. David Burge (b. 1930), is the dedicatee of Crumb's *Makrokosmos, Volumes I*. Robert Miller (1930–1981) is the dedicatee of *Volume II*. Lambert Orkis (b. 1946) made the premiere recording of Crumb's *Celestial Mechanics* with James Primosch.

²⁴ Kenneth Neal Saxon, "A New Kaleidoscope: Extended Piano Techniques, 1910–1975," D.M.A. diss., University of Alabama, 2000.

composers. These delimitations give the study a clear focus. At the same time, the stylistic diversity of the three pieces chosen will provide students, teachers, and performers with a useful introduction to some of the key issues in twentieth-century American pianism.

Organization

This dissertation contains four chapters: Chapter 1, Introduction; Chapter 2, *Piano Four Hands* by Morton Feldman; Chapter 3, *Gravities, for piano four hands* by Richard Felciano; and Chapter 4, *Celestial Mechanics (Makrokosmos IV)* by George Crumb; Chapter 4 concludes with a brief “Coda” that summarizes the main themes of this document.

Chapters 2 through 4 present an overview of each composer’s stylistic development and a general description of the selected composition. Each of these chapters also provides performance guidance and pedagogical suggestions.

CHAPTER 2: *PIANO FOUR HANDS* BY MORTON FELDMAN

Feldman's Compositional Style

Morton Feldman was born in New York in 1926. He studied composition with Wallingford Riegger and Stefan Wolpe in the 1940s. A number of Feldman's compositions are characterized by soft dynamics, slow tempos, and long durations; these features are especially prominent in his later works. He used aleatoric and indeterminate devices with both graphic notation and conventional notation. After he met John Cage in 1950 Feldman became associated with New York School composers, and he was influenced by American abstract expressionist painters. Feldman's *Projection I*, completed in 1950, was one of the first works in which he used graphic notation, allowing performers to choose exact pitches and rhythms. John P. Welsh writes that "Tempo, timbre and density appear to be controlled the most by Feldman; whereas, register, duration and silence are specified with somewhat less precision. Left completely unspecified, to be chosen freely by the performer, are pitch, dynamics and articulation."²⁵ After 1957, Feldman used free duration in his works such as *Piece for Four Pianos* (1957), *Piano Four Hands* (1958), and *Last Pieces* (1959). In these works precise pitches are written on the staff, but performers are free to choose their own tempo and durations. All three of these pieces are notated using stemless black note heads without bar lines or time signatures. Describing pieces from this period, Alex Ross writes, "By the time of *Piano Four Hands* (1958) and *Vertical*

²⁵ John P. Welsh, "Projections I (1950)," in *The Music of Morton Feldman*, ed. Thomas DeLio (Westport, CT: Greenwood Press, 1996), 24.

Thoughts II (1963), durations between chords have become indeterminate in Cagean fashion, but the chords themselves are pure Feldman.²⁶

Feldman composed *Rothko Chapel* in 1971 for the Menil Foundation's devotional room of Rothko paintings in Houston, and it is one of his most remarkable and celebrated works.

According to Alex Ross:

This half-hour soundscape for viola, wordless chorus, percussion and celeste is among the loftiest and loneliest utterances in 20th-century American music. Isolated chords and melodic fragments hover like shrouded forms, surrounded by thick silence; a few minutes before the end, the fog abruptly lifts and the viola sings a heartbreaking Hebraic melody in simple harmonic garb.²⁷

In 1969 Feldman returned to the use of conventional notation, but continued to employ extremely long duration, with respect to both complete works and individual sounds. His *String Quartet No. 1* (1979) lasts one hour and 40 minutes, and his *Second String Quartet* (1983) lasts six hours.

The last major works that Feldman composed for solo piano were *For Bunita Marcus* (1985) and *Palais de Mari* (1986). Both pieces were commissioned by Bunita Marcus (b. 1952), the pianist and composer who worked closely with Feldman. These pieces show some similar features in terms of tempo indication and consistent meter changes.

Piano Four Hands

Piano Four Hands belongs to a group of works from late 1950s to early 1960s that use free durations and explore vertical sonorities. It is a one-page piece in which the primo and the

²⁶ Alex Ross, "Review/ Music; Works by Morton Feldman, Famous Unknown," *The New York Times* (March, 1994), <http://www.nytimes.com/1994/03/01/arts/review-music-works-by-morton-feldman-famous-unknown.html> (accessed June 24, 2010).

²⁷ Ibid.

secondo are notated on the same page. The lowest note is F#1, and the highest note is E6.²⁸

Several notes have octave displacement indications with 8 or 15 above or below the note heads.

Much of *Piano Four Hands* is composed of two-note dyads. Of its seventy-seven vertical sonorities, fifty-five are two-pitch dyads, and twenty-two are chords with three to six pitches.

Because the material of *Piano Four Hands* is so sparse, I have chosen to provide a brief descriptive analysis. The purpose of this analysis is not to establish the structure of the piece in a restrictive way, but simply to provide enough information to make a discussion of its structure possible. Table 1 on p. 14 shows the interval-class content of all seventy-seven sonorities, including both dyads and other vertical sonorities. As shown in Table 1, fifteen dyads involve octave doublings, represented by pitch class 0. One “trichord,” number 35, actually contains only two pitch classes; it is accounted for in the table as an occurrence of interval-class 1. As shown in the table, all interval classes are represented.²⁹

The twenty-one sonorities that contain three or more pitch classes comprise eighteen trichords, two tetrachords, and one pentachord. As shown in Table 2 on p. 14, these vertical sonorities freely mix diatonic and chromatic intervals as well as intervals that would be considered consonant and dissonant in common practice. The 77 sonorities can be divided into two main sections as shown in Table 3 on p.15. (Further implications of this analysis for teaching and learning *Piano Four Hands* are discussed below, on p. 18ff.)

The beginning of the piece employs a simple diatonic passage from C major, presenting a diatonic hexachord in the primo part from sonority number 3 to 8. Sonorities from 33 to 37

²⁸ This document follows the convention of the Acoustical Society of America, in which middle C is designated as C4.

²⁹ This analysis assumes that the vertically aligned notes sound together. While this needs not be true for every sonority in every performance, it is consistent both with the appearance of the piece on the page, and with the earliest recorded performance by Roger Woodward and Ralph Lane. For additional information about this recording, see below page 20.

utilize pitches from chromatic scale followed by a section that uses diatonic scales and a combination of diatonic and chromatic scales concludes the piece.

Table 1. Interval Classes in *Piano Four Hands*

Interval Class	Number of Occurrences
0	15x
1	18x
2	22x
3	22x
4	22x
5	27x
6	8x

Table 2. Prime Forms of Vertical Sonorities in *Piano Four Hands*

Sonority Number	Prime Form
34	(0, 2, 6)
37	(0, 3, 7)
38	(0, 3, 7)
48	(0, 1, 5)
49	(0, 2, 4)
55	(0, 1, 2, 5, 7)
56	(0, 1, 5)
57	(0, 2, 6)
61	(0, 2, 4)
62	(0, 2, 5)
63	(0, 1, 3, 4)
65	(0, 1, 4)
66	(0, 1, 3)
67	(0, 2, 7)
68	(0, 3, 7)
70	(0, 1, 5)
72	(0, 2, 3, 6)
73	(0, 2, 5)
74	(0, 2, 4)
75	(0, 1, 4)
77	(0, 1, 3)

Table 3. Sectional Division of *Piano Four Hands*

Section I (Sonority numbers 1–32)	“C-major” diatonic collection; dyads only
Section II (Sonority numbers 33–77):	Chromatic and diatonic; dyads, trichords, tetrachords, and one pentachord

Pedagogical Suggestions

In 1982–1983 Paula Kopstick Ames met with Morton Feldman to discuss his composition, *Piano* (1977). In the course of one of these conversations Feldman said:

I don’t want my music to be “interpreted.” The performer... must cast his role from the beginning. [I view] the performer as an actor searching for the ‘right’ role which he has an affinity for.³⁰

This statement perfectly describes the challenge that confronts the teacher and the student of Feldman’s *Piano Four Hands*. The piece consists of two parts or “roles,” the conventional primo and secondo, but neither role comes with an interpretation. The only very limited performance indication is “slow, very soft, durations are free for each player.” In this scenario, the conventional teacher-student relationship must be modified. If the teacher approaches *Piano Four Hands* with a preconceived interpretation, the student will simply adopt the teacher’s interpretation instead of searching for his/her own role.

³⁰ Paula Kopstick Ames, “Piano (1977),” in *The Music of Morton Feldman*, ed. Thomas DeLio (Westport, CT: Greenwood Press, 1996), 140.

The first lesson with the student should begin with a brief introduction of Morton Feldman and his music. The compositional technique and stylistic development over the periods need to be addressed in order to provide insight for students before they start learning the piece. Discussing major works written with a similar compositional technique which Feldman uses for *Piano Four Hands* will help students understand the essential parts of Feldman's music.

Piano Four Hands may look like a simple piece at first glance, but the teacher needs to help the student develop an appreciation of its "beautiful simplicity and simple beauty." James W. Iman provides the most emphatic statement of this aspect of Feldman's style. Writing about Feldman's *Durations II*, composed two years after *Piano Four Hands*, Iman states, "Tones are beautiful simply because *tones are beautiful*. They require nothing more."³¹

Although the only dynamic indication is "very soft," asking the student to play the first section in the primo at several different dynamic levels will help the student understand the essential relationship between dynamics and tone color in Feldman's music. Starting with *f*, have the student move to progressively softer dynamics: *mf*, *mp*, *p*, and *pp*. Ask the student to describe how she changes the touch for each dynamic level. Finally, ask the student to produce the "most beautiful" *pp* tone that she can. Although this might seem unnecessary in studying more conventional repertoire, it is an essential first step in understanding Feldman's aesthetic.

Given a performance directive as concise as "slow, very soft, durations are free for each player," the teacher will need to discuss how to interpret these broad suggestions in the actual performance. It should be beneficial for the student to study the piece in small sections, pausing from time to time to ask whether the tempo and dynamic feel "right," in other words, does the

³¹ James W. Iman, *The Official James W. Iman Home Page*, <http://www.jameswiman.com/writings/feldman.htm> (accessed May 14, 2010).

music sound beautiful? This awareness must be reinforced through a discussion about types of touch, articulation, hand distribution, and the importance of listening to both parts at once. Since there may be a natural tendency for the secondo to follow the primo mechanically, it is recommended that the student begin by learning the primo part, while the teacher plays the secondo. However, to fully learn the piece, the student will need to know and play both parts since it sounds quite different depending on which part one is playing.

Since *Piano Four Hands* contains widely spaced sonorities and extreme registers with octave displacements, students need to maintain a keen sense of keyboard geography. Keyboard geography is often viewed as an elementary rudiment, but here the teacher has to explain a further aspect. Pitch motion toward and away from the center of the keyboard dramatically affects tone color; it is therefore an important structural aspect of this piece. In addition, starting with sonority number 55, the primo player will encounter a number of “chords” in which the notes are so widely spaced that they cannot be played simultaneously. Various solutions are possible: arpeggiating the chord using the pedal, or even allowing the secondo to play an unreachable note in the primo. Again it must be emphasized that no one solution can be considered the right one. The performers have to make choices.

Because this work does not require virtuosic technique, phrasing, or even precise rhythms, listening is the essential part of learning *Piano Four Hands*. Students should be directed to listen to each sound envelope from its attack to its decay, and to move on to the next note or chord while still listening to the note just played. Since there is no indication for exact rhythms and durations, both performers should listen to each other very carefully and read the notes on both the primo and the secondo at the same time.

Pedaling is another major consideration in achieving the desired timbre and texture. As is customary in the piano duet repertoire, this task falls to the player of the secondo part (this is another reason why the student must ultimately learn *both* parts). Pedaling decisions are up to the performer, and may also vary from performance to performance. All of the recorded versions consulted make extensive use of the damper pedal. However, since the recordings also vary in ambient reverberance, and since the score contains no information on this point, it remains an essential aleatoric component. Three approaches might be tried in the early stages of practice. One is to play the entire piece without using the damper pedal at all. Another is to keep the damper pedal depressed from beginning to end. A third is to release the damper pedal at two points, first after sonority number 32, the end of the first diatonic section, and again after sonority number 55, the moment of the greatest pitch density. These are not the only solutions, but will provide a framework for subsequent decisions. After experimenting with these three different approaches, the student will begin to develop a sense of how pedaling can be used to enhance her own interpretation.

Exactly how these decisions are made is difficult to describe. DeLio, who is one of the most astute analysts of Feldman's music, writes that the composer "tends to avoid all procedures which might reveal his own presence consciously shaping the surface of the music for the listener."³² One might start by asking the student to look at the first eight tones in the primo part, and describe what she sees. The stepwise diatonic descent from A to C is readily apparent. Heard in combination with the two Cs and the two As in the secondo part, this scalar passage can be recognized as either an Aeolian (minor) or Ionian (major) gesture, which anticipates the ambiguous nature of the piece. In this first small section, we can find three interval-class 0, two interval-class 2 & 3, and one interval-class 5.

³² DeLio, *The Music of Morton Feldman*, 66.

Next, one might look at the last four vertical sonorities (74–77). The interval content—if the notes are played simultaneously—is as follows:

74: M2, m7, m6 (2, 1, 4)

75: M7, m6, M6 (1, 4, 3)

76: P5 (5)

77: M7, M2, m3 (1, 2, 3)

Here we see three trichords, each containing a semitone in combination with whole steps and imperfect consonances (in traditional harmonic language). In *Piano Four Hands*, however, these dissonant chords sound relatively stable, as these closely related sonorities are reiterated. In contrast, the Perfect 5th (76), given its placement and the surrounding context, is by definition a cadential preparation. Like the opening sonorities, this closing section suggests that what Feldman notates as a consonance or dissonance will not necessarily sound consonant or dissonant in context.

This is already taking us into some unfamiliar pedagogical territory. When a work can be readily analyzed, and when the notation provides clear clues to the structure, sections are readily apparent, and the work of teaching and learning generally moves forward in an orderly fashion. With *Piano Four Hands*, one must work forwards (from its lucid beginning) and backwards (from its final “cadence”) to find patterns and sections in the unpredictable unfolding of sounds.

Use of Recordings

There are four major recordings of *Piano Four Hands* listed in the discography on the Morton Feldman website.³³ These recordings range from 5'54" to 10'55" in length. The range of

³³ Chris Villars, “Morton Feldman Page,” <http://www.cnvill.net/mfhome.htm> (accessed June 24, 2010).

interpretation available on recordings can be helpful for students to explore various possibilities of tempos for this work, and to understand aleatoric aspects of the piece.

The earliest available recording of *Piano Four Hands* appears on a CD entitled *Triadic Memories*, recorded by Roger Woodward and Ralph Lane in 1990.³⁴ Woodward is the Australian pianist, conductor, and composer for whom Feldman wrote the 90-minute *Triadic Memories*. Although the duration of each sonority is free, the notes in the primo and the secondo parts that align vertically are played at the same time or very nearly so. The dynamic remains soft throughout the piece. The damper pedal sounds like it is controlled by the secondo player as the performance includes many low bass notes held by the pedal. When black-key chromatic pitches are introduced, Woodward and Lane emphasize them with slightly louder dynamics and sometimes by holding them longer. The duration of this performance is 7'31".

Le Bureau des Pianistes recorded *Piano Four Hands* on *Morton Feldman /Pieces for More than Two Hands* in 1991.³⁵ The members of this ensemble include Laurence Cornez, Kaat De Windt, Jean-Luc Fafchamps, Stephane Ginsburgh, and Jean-Luc Plouvier. In this recording, *Piano Four Hands* lasts 10'55", and the interpretation is remarkable in several ways. The primo and the secondo play the first sonority at the same time, then the primo moves ahead of the secondo for a while, and finally the secondo takes the role as a leader for the second half of the piece. They start the piece with a somewhat stronger presentation of the first sonority and use subtle dynamic changes within a soft dynamic level thereafter.

Kristine Scholz and Mats Persson have given many successful duo performances of contemporary repertoire. Their recording of *Piano Four Hands* was released on *Morton*

³⁴ Morton Feldman, "Piano Four Hands," on *Triadic Memories*, performed by Roger Woodward and Ralph Lane, Etcetera CD, 1990.

³⁵ Morton Feldman, "Piano Four Hands," on *Pieces for More Than Two Hands*, performed by Le Bureau des Pianistes, Sub Rosa, 1991, CD.

Feldman: Complete Works for Two Pianists in 2002, and has a duration of 6'54".³⁶ They took a number of different approaches to the notated vertical sonorities. Some are heard simultaneously, while others start and end at different points in time. The secondo player tends to hold some low notes longer, prolonging the time between attack and decay to produce long resonance.

Frank Denyer, professor of composition at Dartington College of Arts, Devon, England, recorded *Piano Four Hands on The Ecstasy of the Moment* in 2004.³⁷ The primo and the secondo play the first and the second sonorities at the same time then from the third sonority on, the primo moves ahead of the secondo by one or two sonorities. The black notes in the primo are brought out with less emphasis on the secondo bass notes. This recording presents the shortest duration, among the four recordings which have mentioned in this chapter, 5'54".

The student's goal is to develop his/her own interpretation creatively instead of imitating ones from the above recordings. After listening to each recording, the teacher and the student need to discuss each briefly, pointing out differences between them. Here, the purpose of listening to one or more recordings is not to find an interpretation to emulate, but to understand that there is no one definitive interpretation.

Comments by Performers

As pianists and piano teachers, we are not only interested in the scholarly and critical responses to Feldman's work, but equally value the responses of pianists who have performed his music. Because of the many possibilities for performing this work, all performers go through

³⁶ Morton Feldman, "Piano Four Hands," on *Complete Works for Two Pianists*, performed by Kristine Scholz and Mats Persson, Alice, 2000, CD.

³⁷ Morton Feldman, "Piano Four Hands," on *The Ecstasy of the Moment*, performed by Frank Denyer, Etcetera, 2004, CD. Additional remarks by Denyer on his approach to the piece are included below, pp. 23–24.

a process of analysis, and a number of them have published comments about how they interpret their own roles as performers of Feldman's music.

Mats Persson's article, "To Be in the Silence," is included in the recording, *Morton Feldman: Complete Works for Two Pianists*, performed by Persson and Kristine Scholtz. It provides useful insights about the relationship between Feldman's music and the visual arts.

Persson writes:

What Feldman is in fact doing is describing his own music and his instrumental sound ideals. *With a minimum attack, soft, very soft and as soft as possible* are the most common instructions in Feldman's scores, meaning that the tones are played as quietly as possible. He has many times formulated a utopic sound ideal where one cannot hear which instruments are playing—a sourceless sound. As the sound character of an instrument is largely to be found in the attack, it would thus appear that the instructions aim at achieving something as paradoxical as an abstract instrument sound—a sound that is also to be found in Guston's painting.³⁸

In this article Persson brings out the need to use a very soft dynamic throughout *Piano Four Hands*.

Persson writes of his fascination with Feldman's music from the 1950s:

Music that borders on the silent, piano pieces in which, as well as being reduced to a minimum, silently depressed keys allows the free strings to resonate, though often extremely quietly. In order to be able to hear, the listener has to sit close to the piano and thus experience an acute shift in perspective: though the resonation of the unplayed strings can be heard, the softly-played tones, the attacks are suddenly strongly felt, unevennesses in touch and sound are distinctly heard and the inner life of the piano, the rustle of the felt on the dampers and hammers, the creaking and squeaking of the mechanical parts and pedals starts to be audible... It is an extremely intimate music that is meant only for very few listeners at one time and almost impossible to record. A music that is full of paradox and is in itself a negation of established forms.³⁹

³⁸ Mats Persson, Liner Notes to recording of Morton Feldman, "Piano Four Hands," on *Complete Works for Two Pianists*, performed by Mats Persson and Kristine Sholz, Alice, 2002, CD. Philip Guston (1913–1980) was a painter in the New York School and had a close friendship with Morton Feldman from the early 1950s. One of his notable accomplishments was his active involvement of the transition from Abstract expressionism to Neo-expressionism in painting.

³⁹ Ibid.

Here, the emphasis is not on the free durations of Feldman's music, but on Feldman's interest in extremely soft dynamics. Of course, *Piano Four Hands* does not require silently depressed keys, and clearly it is not impossible to record. Nevertheless, the title of Persson's essay, "To Be in the *Silence*" (emphasis added), tell us how he and Scholtz approach their performance of *Piano Four Hands*.

Denyer writes about *Piano Four Hands* in his notes for the 3-CD set of Feldman's music, *The Ecstasy of the Moment*, recorded in 2004.

The scarcity of material makes it possible to play yet softer still, but to accomplish this the pianists' physical and psychological preparation for each note must also be intensified, so that every sound is made an end in itself. We seem to almost reach the edge of silence, the limits of the musicians' sensibilities and the instrument's capacities. This was as far as Feldman could penetrate at this particular time. *Piano Four Hands*, compared to its predecessors, reveals a more abstract sound world; nor do its features essentially alter during its allotted time span, so one feels rather like the ancient astronomers contemplating, not the moving planets, but that remote and mysterious area known as 'the fixed stars'.⁴⁰

Denyer's innovative approaches on making a recording of Feldman's music are explained in his own statement as follows:

In scores of this type (not only *Piano Four Hands* but the Durations series and others) where each player chooses durations independently of the other player or players, the absence of precise co-ordination with the other players allows each musician to concentrate much more on playing really softly, which for pianists means being ultra sensitive to the tactile aspects of touch. However, each player must keep a more or less steady slow pulse of their own. This must not be mentally subdivided, but as it is very slow, it will inevitably tend to vary naturally without losing its regularity. At the same time each player must have some recognisable aural moments in the other players parts that allow them to judge whether, overall, they are speeding up or slowing down vis a vis the others. Imperceptible but compensatory action is then required so that no player gets excessively ahead or behind.

In pieces of this type for just two players (*Piano Four Hands*; *Durations 2*; *Two Instruments* etc) there is an added problem. It can be almost impossible not to follow the other player's part to some extent and therefore one may find oneself placing the given notes in relation to it. The music usually becomes very

⁴⁰ Frank Denyer. Liner notes to recording of Morton Feldman, "Piano Four Hands," on *The Ecstasy of the Moment*, performed by Frank Denyer, Etcetera, 2004, CD.

artificial, the relationships too ‘rational’ and pre-determined. This distracts from the amount of awareness the pianist should be giving to touch. One solution, which can also be applied to pieces for larger ensembles, is to make a performing copy that contains just one’s own part. The results are immediately more musical and it also reduces the number of page turns.

I learned this from Feldman himself with whom I played many such pieces.

In the recordings on the *Ecstasy of the Moment* set I play both parts. Each part was recorded while hearing the other.⁴¹

We can employ the same technique while the student learns the piece; record the primo and the secondo separately and play one part with the recorded other part. This is a great practice tool for the student since she can learn both parts without the duet partner, while focusing on listening to each of the individual parts.

In conclusion, it may be helpful to consider a comment made by Amy Williams, who performs the piece with Helena Bugallo as a member of the Bugallo-Williams Piano Duo. In response to a reporter’s question about *Piano Four Hands*, Williams stated:

Well, that’s a beautiful piece, quite simple in the sense that we don’t really need four hands, we need four fingers—although they’re spread out all over the piano. It starts with single notes and then a few chords come in. But what’s so beautiful about it is it starts with just the white notes of the piano, so he creates this very tonal effect, almost like a folk song stretched out over the whole piano. And then gradually some of the black notes creep in, and when they do it’s so surprising and wonderful...

It’s [a] piece that’s simple but, I think for the listener, you really have to concentrate to listen to all the subtle things that are happening in the piece, and the resonances.⁴²

This is sound advice for the listener, but even more essential for the performers of *Piano Four Hands*, teacher and student alike.

⁴¹ Denyer, e-mail to the author, 26 July 2010.

⁴² Jan Jezioro, “One Piano, Four Hands,” *Art Voice* (2007), http://artvoice.com/issues/v6n12/one_piano_four_hands (accessed April 14, 2010).

CHAPTER 3: GRAVITIES BY RICHARD FELCIANO

Felciano's Compositional Style

Richard Felciano was born in Santa Rosa, California, in 1930. He studied composition with Darius Milhaud and with Luigi Dallapiccola. Aleatoric, electronic, and innovative acoustic elements are common in his music, and he has written many combinations of traditional instruments and electronic sounds. *God of the Expanding Universe* and *Litany* are for organ and electronic sounds. *Crisis* is scored for flute, clarinet, violin, cello, piano, harp, percussion, and electronic sounds. Felciano was among the first to use electronic music in a liturgical context. *Glossolalia* was written in 1967 and scored for baritone, organ, percussion, and electronic sounds. His compositions include a chamber opera and a theater piece, orchestral pieces, an organ concerto, and choral music. In the early seventies he wrote *Galactic Rounds*, an orchestral work which used rotating trumpets and trombones dispersed throughout the orchestra to create Doppler shifts. Felciano's interest in sonic explorations also led to his interest in non-Western instruments. *In Celebration of Golden Rain* is scored for organ and Indonesian gamelan. Felciano's works for solo piano include *Five Short Piano Pieces* (1986), *Prelude* (1997), and *Two Hearts: A Minute Waltz for Speaking Pianist* (1977).⁴³

⁴³ Richard Felciano, *Two Hearts: A Minute Waltz for Speaking Pianist* (Boston, MA: E. C. Schirmer Music Company, 1979). *Two hearts* is fifty measures in length. In six separate measures, the pianist speaks the following phrases: "eins, zwei, drei; one, two three; two hearts in; two hearts in; two hearts in; three quarter." 1979 is the publication date; Felciano composed the piece in Zürich, Switzerland in 1977.

Gravities

Felciano wrote *Gravities* for Milton and Peggy Salkind, and the Salkinds' recording remains the only one commercially available. However, *Gravities* is in the concert repertoire of other prominent piano duos including ZOFO and Isabelle & Florence Lafitte. Keisuke Nakagashi and Eva-Maria Zimmermann are the members of ZOFO, and their repertoire includes less-known four-hand compositions as well as arrangements of well-known orchestral works with an emphasis on twentieth and twenty-first century pieces.

Gravities is a short work of 129 measures and about seven minutes duration. It falls into three sections with sharp contrasts between sections. Section I and III are similar in character while section II is very different. Rhythmic complexity and the use of extreme registers are prominent characteristics of *Gravities*. The piece is atonal, but not serial, making free use of repeated notes and octave doublings.

The first section (mm. 1–49) begins with the lowest B-flat on the piano played quietly by the secondo. The primo answers with a dyad composed of A1 and the highest B-natural on the keyboard. Suddenly, very fast moving notes are heard with *ff* dynamics and *martellato* accents. This soft/loud pattern is repeated several times in the first section, with complex polyrhythms present in the fast sections.

The middle section (mm. 50–91) begins with a clear change to a much sparser texture. It develops the soft/loud contrast of the opening with a series of crescendos and diminuendos, eventually spanning the dynamic extremes of *ppp* to *fff*. It starts *ppp* in the primo, building to *ff* before the secondo enters and follows the same trajectory.

The third section (mm. 92–121) returns to the style of the first section, with overlapping rhythms and fast-moving notes. A coda (mm. 122–129) concludes the piece with 8 measures of quiet notes in the style of the middle section.

Pedagogical Suggestions

The pedagogical suggestions given here are not intended to provide a linear, measure-to-measure and page-to-page guide through *Gravities*. Rather, the goal is to identify the major technical and musical challenges presented in *Gravities*, and to give the teacher and student some resources for addressing them. Two such resources have been identified. One is Felciano’s own composition, *Five Short Piano Pieces*.⁴⁴ The other, which sheds light on the Latin-inflected dance rhythms of *Gravities*, is Rebecca Mauleón-Santana’s highly regarded introduction to Salsa-style piano technique, *101 Montunos*.⁴⁵ Each will be discussed. This chapter will then conclude by offering some specific practice suggestions.

Five Short Piano Pieces

Among Felciano’s works for piano, *Five Short Piano Pieces*, mentioned earlier, is a uniquely valuable pedagogical resource. *Five Short Piano Pieces* was written in 1986 for the Music Teachers Association of California. George Fisher describes *Five Short Piano Pieces* as follows:

Felciano’s *Five Short Piano Pieces* is a brilliant set. While there are sharp contrasts in texture, gesture, and style of presentation among the parts, all share in the enterprise of exploring the sonic resources of the contemporary piano in imaginative ways.⁴⁶

⁴⁴ Richard Felciano, *Five Short Piano Pieces* (Berkeley, CA: Fallen Leaf Press, 1992).

⁴⁵ Rebecca Mauleón-Santana, *101 Montunos* (Petaluma, CA: Sher Music Co., 1999).

⁴⁶ Fisher, “Music Reviews,” 1334–1336.

In a preface and throughout the score, Felciano generously provides detailed performance suggestions for the *Five Short Piano Pieces* in a teacher-friendly manner. *Five Short Piano Pieces* features a number of technical challenges also found in *Gravities*. However, in the *Five Short Piano Pieces*, specific technical challenges are presented in a more systematic way. For this reason, it is recommended that the teacher assign the *Five Short Piano Pieces* to the student before the student begins to learn *Gravities*.

According to Felciano's own comments:

The first, third, and fifth are “ringing pieces,” using various pedals and pedal techniques. The second piece is a pattern of rapid trajectories; the fourth a fast, percussive dance.⁴⁷

The use of “ringing” notes is especially relevant to the middle section of *Gravities*; rapid trajectories and percussive rhythms are featured in *Gravities*' outer sections.

The first piece, “Trumpet for the Apparition of the God of Harmony,” demands rhythmic precision because it features a repeated pattern of fast-moving notes followed by rests of long duration. The notes should be played quickly, and Felciano suggests that they “should sound like trumpet calls.”⁴⁸ The durations of the rests are indicated in seconds. Felciano suggests:

You must count seconds precisely and place them between the groups (not from the beginning of one group to the beginning of another) to allow time for the sympathetic vibrations to sound.⁴⁹

Because of his interest in sympathetic vibrations, Felciano often uses the sostenuto (middle) pedal in this piece. In a note, he describes the effect of the sostenuto pedal in the grand piano and upright piano.

⁴⁷ Felciano, *Five Short Piano Pieces*.

⁴⁸ Ibid.

⁴⁹ Ibid.

The second piece is titled “Directions.” Felciano indicates, “All notes and rests of equal value and AFAP (as fast as possible). Left and right hands alternate without pause. Upper staff always right hand; lower staff always left.”⁵⁰ Felciano states that “the scales of the second piece sit well under the hand; they define registers, not traditional scales.”⁵¹ This piece can be used as preparation for the continuously fast-moving 32nd note-passages in *Gravities*.

The third piece is titled “A Distant Singing.” Fisher states that it juxtaposes two sets of sparse and fragile materials in a more controlled way.⁵² The left hand plays ostinato-style eighth notes, and the right hand executes grace notes that create ringing sounds. Felciano’s clear indication regarding the pedal is as follows:

Silently depress 2 lowest chromatic octaves while engaging Pedal II (sostenuto). Depress Pedal II for duration of piece without interruption. Depress and release Pedal I (damper) as indicated. Resonance should change when Pedal I is released.⁵³

Similar pedal techniques are employed in *Gravities* as discussed below on p. 36.

“Drums,” the fourth piece, is very percussive and situates both hands in the low register. It has three distinct sections. In the first, Felciano wants the right hand to be brought out and played heavily with strong accents while the left hand presents an ostinato of staccato sixteenth-notes without pedal. In the middle section, the hands reverse roles; the left hand is brought out while the right hand plays the ostinato. The last section requires irregular accents in both hands with no ostinato. In order to play these notes accurately, the student first needs to practice the last section without accents until the notes are memorized, and then practice the passages with

⁵⁰ Felciano, *Five Short Piano Pieces*.

⁵¹ Ibid.

⁵² Fisher, “Music Reviews,” 1334–1336.

⁵³ Felciano, *Five Short Piano Pieces*.

strong accents as written, beginning with a slow tempo. This will be useful preparation for the irregular accents in both the primo and the secondo parts of *Gravities*.

“The Pendulum of Heaven” is the last piece in the set. Fisher describes it as follows:

The Pendulum of Heaven projects through its combination of bell-like sonorities an elegance qualified only by the comic pedal instructions at the beginning (“Pedal I depressed throughout, but cheer up”)⁵⁴

The pedagogical concerns and technical challenges presented by the *Five Short Piano Pieces* can be summarized as follows: 1) precise use of pedals and awareness of sympathetic vibrations; 2) rapid figuration in non-traditional scalar patterns; and 3) irregular accents in both hands.

101 Montunos

In the preface to *Gravities*, Felciano described his compositional approach to this piece as follows:

The piece evolves by subjecting its musical ideas to forces of attraction and repulsion in terms of each of the compositional materials involved: duration, harmony, dynamics, and texture. Contrast is achieved through stasis. Dance gestures and certain aural images of electronic music are in evidence (a dancer, after all, is in constant dialogue with gravity...). The four-hand medium is exploited through the simultaneous use of wide registers and the employment of overlapping rhythms and dense textural blocks not otherwise available.⁵⁵

Felciano states that “Dance gestures” are evident in *Gravities*. Furthermore, although he does not state this explicitly, the dance gestures found throughout *Gravities* are taken from rhythms found in Salsa music, Latin jazz, and Afro-Caribbean music. In her book, *101 Montunos*, Rebecca Mauleón-Santana defines these terms and explains their connotations. She writes “Generally speaking, the difference in terminology often has to do with dance music versus concert music,

⁵⁴ Fisher, “Music Reviews,” 1334–1336.

⁵⁵ Felciano, *Gravities*.

so ‘Salsa’ would refer to music designed primarily for a dancing audience, while ‘Latin Jazz’ would cater to more of a listening crowd.”⁵⁶ In the present study, the term Salsa is used in the sense defined by Mauleón-Santana, to refer to a broad spectrum of dance rhythms analyzed in her book.

Several of the complex rhythms found in *Gravities* have close parallels in Mauleón-Santana’s guide to Salsa; thus Mauleón-Santana’s book is useful not only to understand the “Salsa” rhythms found in *Gravities*, but also to teach them. There are several musical examples in *101 Montunos* that can serve as studies for understanding and learning the rhythms in *Gravities*. Fig. e. on page 3 of *101 Montunos* illustrates *clave campesina* in 2/4 meter, which is essentially a displacement syncopation in which the last sixteenth-note of beat one is tied to the first sixteenth note of beat 2; *clave campesina* is the “key” to understanding the syncopation found in m. 9 of *Gravities*. Mauleón-Santana’s illustration of *clave campesina* is reproduced below as Figure 1.

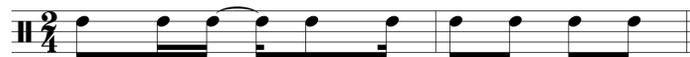


Figure 1. *Clave Campesina* Rhythm

As discussed below on p. 35, the student must learn to make this rhythm flow smoothly, avoiding excessive accents on the off-beats. In *clave campesina*, the repetitive nature of the pattern is emphasized. *Clave campesina*, illustrated in its simplest form by Mauleón-Santana, provides the basis for Felciano’s more varied syncopations.

⁵⁶ Mauleón, *101 Montunos*, iv.

Fig. h. on page 5 of *101 Montunos* illustrates the *tresillo* pattern. *Tresillo* is the 3-3-2 pattern most commonly notated in Western music as two dotted quarters followed by a quarter note in 4/4 time.⁵⁷ Mauleón-Santana’s illustration of *tresillo* rhythm is reproduced below as Figure 2.



Figure 2. *Tresillo* Rhythm

This pattern appears in the very first measure of *Gravities*, where a rest of three eighth note’s duration is followed by a note of equal duration, and then by a quarter-note rest. The pattern reappears on the second beat of m. 16, now in sixteenth-note diminution. Like the *clave campesina* pattern, the *tresillo* pattern provides a conceptual basis for Felciano’s “dance gestures.”

Appendix A, “Exercises for Independence,” in *101 Montunos* is designed to help the student develop or improve polyrhythmic sensibility. Exercise numbers 5 to 10 are especially relevant.

Exercise 5 is in 4/4 time, with half-note triplets in the right hand and two half notes in the left hand; exercise 6 reverses the pattern, with two half notes in the right hand and triplets in the left hand. These exercises help the student master the skill of playing two-against-three at a moderate tempo.

Exercise 7 is in 4/4 time, with four quarter notes in the right hand and half-note triplets in the left hand; exercise 8 reverses the pattern with half-note triplets in the right hand and four

⁵⁷ Mauleón, 5. The *tresillo* is also known as the “three-side” of *son clave*, which is ubiquitous in modern salsa.

quarter notes in the left hand. These exercises help the student master the skill of playing three-against-four at a moderate tempo.

Exercise 9 and exercise 10 are similar to exercises 5 and 6, but in the latter exercises, quarter notes and quarter-note triplets are used. This results in a four-against six-pattern that is equivalent to the two-against-three studied earlier, but played twice as fast.

These exercises can be applied to a remarkable passage in mm. 46–48 of *Gravities*. Here, Felciano asks the primo to play sixteenth-note sextuplets in the right hand against sixteenth-note quintuplets in the left hand. Concurrently the secondo plays sixteenth-notes in the right hand against eighth-note triplets in the left hand. Disregarding, for the moment, the left hand of the primo, the remaining lines are a combination of two-against-three and three-against-four patterns that Mauleón presents as basic salsa cross-rhythms. The student and teacher should practice these three lines together. They can take turns playing both hands of the secondo against the right hand of the primo, until the student is completely comfortable with all of the combinations of two-against-three and three-against-four that make up this section. Once the student achieves this goal, the quarter-note pulse should be solid. The sixteenth-note quintuplets, which can only be played accurately by feeling the quarter-note pulse, can then be introduced.

Specific practice suggestions

It must of course be acknowledged that the insights drawn from Felciano's *Five Short Piano Pieces* and Mauleón's *101 Montunos* will not magically allow the student to play *Gravities*. The student will need to synthesize and apply what she has learned about Felciano's interest in sonority (as discussed in relationship to *Five Short Piano Pieces*)

and what she has learned about Felciano’s interest in dance gestures (discussed in relationship to Mauleón’s *101 Montunos*), in order to produce a convincing rendering. However, with these suggestions in mind, the student should be able to undertake the work of practicing and learning *Gravities* with a solid understanding of its style. A number of specific practice suggestions are provided below.

***Gravities*, Section I: m. 1–m. 49.** There are four main pianistic challenges in the first section; rhythmic complexity; use of wide registers with octave displacement; hand distribution; and dynamic control.⁵⁸

(1) m. 1–m. 6

The piece begins with a quiet single note, B-flat, in the low register followed by two simultaneous pianissimo high pitches, even softer than the first note. The B-flat in the secondo has the indication “lift hand.” According to Felciano’s performance suggestion, the player is to

[l]ift hands immediately after playing, as though the action of playing is more a pulling away from the keys than a depressing of them, thus drawing a rounded, luminous resonance from the strings.⁵⁹

The secondo player needs to carefully apply the above suggestion because B-flat functions as the pedal point for the first six measures. Demonstrations and discussion of various hand positions will be needed for the student to achieve this technique. The attack should be firm and smooth, while maintaining an arched hand position; to achieve a sharp release, the student should practice closing the fingers toward the palm with a plucking motion. This technique is required at a number of subsequent places in the piece, especially in the middle section.

⁵⁸ Another apparent challenge turns out to be merely a notational idiosyncrasy: all pedal indications are placed between the primo and secondo parts, rather than under the secondo. This does not mean that the primo should control pedaling, but that both players should be equally aware of its effect on the overall sonority.

⁵⁹ Felciano, *Gravities*.

Then suddenly, in measure 2, a syncopated and dissonant figure marked *ff* and *martellato* is presented contrapuntally, in very fast moving notes. The vivid contrast in sound between m. 1 and m. 2 is developed throughout the piece and gives *Gravities* its characteristic sound. The third measure starts with the low B-flat in the secondo; then primo presents a similar pattern as in measure 1, but this time in an extended form. The fourth measure resembles the second measure with its fast moving *ff* notes. The upper staff in the primo part is marked 15^{va}. This passage should be practiced very slowly until the pattern is memorized. Although the complete phrase is distributed between both hands, the left-hand notes are an integral part of the rhythmic pattern, not an interruption of it. Playing the first two notes and adding one note at a time with lots of repetition will enable the student to play the whole pattern without difficulty.

(2) m. 7–m. 11

There are two technical issues to be addressed in this section. Felciano wants to “treat all *quasi accelerando* and *rallentando* markings as freely as possible and without metric accent.”⁶⁰ These indications are found throughout the short passage from m. 7 to m. 11, and reappear later. In mm. 8 through 10, both hands in the primo and the left hand in the secondo have identical rhythms, in which no notes on the first beat, none on the second beat, and only one note on the third beat is sounded. In order to play this extended syncopation smoothly, a metronome is essential. The metronome should be set to sound on the eighth-note division of the beat. Excessive accents on the off-beats must be avoided, as these tend to disrupt the flow of the rhythm.

(3) m. 12–m. 49

The student needs to learn a number of complex rhythmic patterns that demand very precise counting ability in this section. Triplets, quintuplets, and sextuplet groupings containing

⁶⁰ Felciano, *Gravities*.

rests in unexpected locations are present; these are difficult to play precisely, especially in a fast tempo. The student needs to practice slowly, and using a metronome remains essential.

Mastering all the rhythmic patterns hands separately should precede putting the hands together.

Section II: m. 50–m. 91. The middle section is more static in character, with repeated notes appearing in each hand. The texture also gets thinner. As previously discussed on p. 29, Felciano’s instructions regarding pedaling and making a ringing sound in “A Distant Singing” from *Five Short Piano Pieces* are directly applicable to this section of *Gravities*.

Felciano’s instructions “lift hand” and “precise release!” appear prominently in this middle section. The practice technique discussed above on p. 34 is equally relevant here.

Section III: m. 92–m. 129. After twenty-three measures of ostinato passages in the second section, a very sudden change in both dynamics and character marks the opening of the last section, which returns to the rhythmic complexity and wide ranging registers of the first section. The primo plays a chord marked *fff* and *pesante*, followed by a single note with a strong accent. The secondo concludes the measure with a *glissando* figure. Felciano instructs: “white key cluster arpeggio; play with side of right hand; last 3 notes coincide with left hand chord.” Other features introduced in the first section, such as long trills and wide jumps incorporating grace notes, also reappear in the last section.

Towards the end, as the texture gets less dense, Felciano indicates that the secondo “depresses silently with both arms as many keys as possible while engaging the sostenuto pedal.”⁶¹ The primo player needs to present the final passage according to Felciano’s following indication: “Linger on highest note, *accel.* Descending, *rall.* ascending; rhythm should resemble that made by a coin as it oscillates to a stop, having been tipped from a standing position on its

⁶¹ Felciano, *Gravities*.

edge.⁶² The teacher should be prepared for this moment by having a large coin handy for demonstration to the students.

The last fourteen measures feature sharp contrasts between extreme dynamics from *m.* 116 to *m.* 121; an arpeggio-like passage with a tonal center of D-flat maintains a loud dynamic. Then the final eight measures feature dynamics ranging from *p* to *pppp* with a single-note pattern previously used in the second section. The student needs to achieve control of these degrees of softness when playing those single notes. The teacher must explain and demonstrate to the student exactly how the action of her finger on a key controls the speed of the hammer striking the string.

⁶² Felciano, *Gravities*.

CHAPTER 4: *CELESTIAL MECHANICS* BY GEORGE CRUMB

Crumb's Compositional Style

George Crumb was born in Charleston, West Virginia on October 24, 1929, and started writing music at an early age. Crumb's family tradition of playing chamber music in the home was one of the most important influences during his childhood musical training. During his high-school years, Crumb wrote two large works for orchestra, *Poem* (1946) and *Gethsemane* (1947); both works were performed by the Charleston Symphony Orchestra in 1947 and 1952 respectively. After he graduated from the Mason College of Music and Fine Arts in Charleston, Crumb studied composition with Eugene Weigel at the University of Illinois. He composed *Trio* (1952) for strings and *Sonata* (1953) for viola and piano, and he adopted the musical style of Hindemith and Bartók in both compositions. After the completion of his Master of Music degree, Crumb undertook doctoral studies at the University of Michigan with Ross Lee Finney. Crumb wrote *Variazioni* for large orchestra as his final composition project for the doctoral degree, which he received in 1959. He used twelve-tone technique in this work, but it is not consistently serial in its application. It is considered a transitional piece between his student and mature works. His mature compositions, beginning in the early 1960s, typically feature unusual timbres and extended performance techniques.

Crumb taught at the University of Colorado at Boulder from 1959 to 1964. His representative compositions during this time are *Five Pieces for Piano* (1962), *Night Music I* (1963), and *Four Nocturnes* (1964). *Five Pieces for Piano* was dedicated to his colleague, pianist David Burge. It is the first of Crumb's mature works to use conventional keyboard technique

along with extended techniques involving direct contact with the strings by the performer. David Cope describes *Five Pieces* as follows:

Here the elements of a Webern-like economy, pointillism, and Klangfarbenmelodie, fused with a sensitive West Virginia folk heritage, generate an intensely dramatic and coloristic texture known widely as Crumb's trademark. Special timbral effects—produced by pizzicato and glissando techniques, harmonics, and a meticulous use of the damper pedal—are beautifully integrated with conventionally produced sounds to create, in effect, a new instrument.⁶³

Crumb began to teach composition at the University of Pennsylvania in 1965. He composed *Madrigals, Book I* (for soprano, vibraphone, and double bass) and *Madrigals, Book II* (for soprano, flute/piccolo/alto flute, and percussion) the same year.

In the 1970s Crumb composed *Ancient Voices of Children* (1970), a song cycle for two singers and small instrumental ensemble, *Black Angels* (1970) for electric string quartet, *Lux Aeterna* (1971) for soprano, bass flute/soprano recorder, sitar, and percussion, and *Makrokosmos, Volumes I–IV* (1972–1979).

Crumb's compositions for piano written after 1980 include *A Little Suite for Christmas, A.D. 1979* (1980); *Gnomic Variations* (1981); *Processional* (1983); *Zeitgeist (Tableaux Vivants)* (1988) for two amplified pianos; *Eine Kleine Mitternachtmusik* (2002); and *Otherworldly Resonances* (2003), for two pianos.

Makrokosmos

Crumb composed a series of four large-scale works which he entitled *Makrokosmos*. He completed *Makrokosmos I* in 1972 and *Makrokosmos II* in 1973. Each of the volumes is scored for solo amplified piano. *Makrokosmos III (Music for a Summer Evening)* was written in 1974 for two amplified pianos and percussion.

⁶³ David Cope, "Biography," in *George Crumb: Profile of a Composer*, ed. Don Gillespie (New York: C. F. Peters Corporation, 1986), 11.

David Cope states that “the solo volumes of *Makrokosmos* use all the timbral devices first found in *Five Pieces*, but in a much more elaborate manner.”⁶⁴ The unusual playing techniques involved in performing *Makrokosmos I* and *II* include the following: producing unconventional sounds with the hands, such as pizzicatos, harmonics, muted strings, *glissandos* on the strings, and striking the sound board; manipulating objects on the strings, such as a chain, thimbles, tumblers, and plectra; and producing vocal and whistled effects.

Celestial Mechanics

Celestial Mechanics (Makrokosmos IV), Cosmic Dances for Amplified Piano, Four Hands was completed in April 1979 and premiered in 1979 by Gilbert Kalish and Paul Jacobs. For an overview of the work, the obvious starting point is Crumb’s own description of its genesis in the program note he wrote for it.

I had long been tempted to try my hand at the four-hand medium, perhaps because I myself have been a passionate four-hand player over the years. The best of the original four-hand music—which includes, of course, those many superb works by Mozart, Schubert, and Brahms—occupies a very special niche in the literature of music. The idiom, a strange hybrid of the pianistic and the orchestral, lends itself readily to a very free and spontaneous kind of music—one thinks of the many collections of dances of various types and of the predilection for the “fantasy” genre. The present work, therefore, comprising a suite of “cosmic” dances composed in a rather “fantastic” style, falls squarely within the tradition.⁶⁵

Although Crumb insists that *Celestial Mechanics* be performed with the spontaneity of a fantasy or fantasia, the score is full of very specific performance directions. Hyangmee Kim’s “A Performer’s Guide to George Crumb’s *Makrokosmos IV (Celestial Mechanics)*,” cited in the introduction to this document, focuses exclusively on the highly detailed performance indications found in this work. In the present document, Crumb’s performance indications are discussed

⁶⁴ Cope, “Biography,” 14.

⁶⁵ Crumb, *Celestial Mechanics*.

selectively, with an emphasis on helping the student master the theatrical and emotional elements of the work, as well as its technical demands.

Pedagogical Suggestions

As an inherently theatrical work, *Celestial Mechanics* explores extreme emotional contrasts. A review by Shirley Fleming describes the piece as follows:

Celestial Mechanics continues Crumb's exploration of the altogether otherworldly colors and sonorities—in astonishing variety—that can be coaxed out of a piano. The four-movement work is more adamant, assertive, brutal than its predecessors, at least in the first and third movements. But characteristic passages of breath-holding delicacy culminate in a final section in which space seems expanded and time slowed down. The work is carefully shaped around the two extremes.⁶⁶

To perform *Celestial Mechanics* successfully, a student must learn to play with assertive brutality as well as with “breath-holding delicacy”. Of course both aggressive and delicate playing is demanded by much of the common-practice repertoire. However, because Crumb is highly conscious of the theatrical aspect of piano performance, his work is especially useful in helping students achieve confidence on the stage.

Further insight into the emotional extremes of *Celestial Mechanics* can be found in a note that Crumb placed in the preface of *Makrokosmos I*:

The title and format of my *Makrokosmos* reflect my admiration for two great 20th-century composers of piano music—Béla Bartók and Claude Debussy. I was thinking, of course, of Bartók's *Mikrokosmos* and Debussy's *24 Preludes* (a second zodiacal set, *Makrokosmos, Volume II*, was completed in 1973, thus forming a sequence of 24 “fantasy-pieces”). However, these are purely external associations, and I suspect that the “spiritual impulse” of my music is more akin to the darker side of Chopin, and even to the child-like fantasy of early Schumann.⁶⁷

⁶⁶ Shirley Fleming, “Out of World Pianistic Experience,” *New York Post*, November 19, 1979.

⁶⁷ George Crumb, *Makrokosmos I* (New York: C. F. Peters, 1972).

Here the brutal/delicate dichotomy that Fleming perceived is supplemented by another emotional contrast stated by Crumb himself: emotional “darkness,” contrasted with child-like fantasy or innocence. In addition, Crumb offers specific suggestions—on where to look for works of comparable scope or with a similar “spiritual impulse,” namely the works of Debussy, Bartók, Chopin, and Schumann. A useful strategy is to introduce works by these composers in conjunction with the study of *Celestial Mechanics*. The aim is to help the student play with the necessary aggression and delicacy, first within a context of standard repertoire, and then in the context of Crumb’s extended performance technique. In particular, pieces by Bartók and Debussy will be introduced in this study as they are relevant to *Celestial Mechanics*.

A review of a recent performance of *Celestial Mechanics* provides a useful point of departure. The chamber ensemble, *Earplay*, performed it in February, 2011, at Herbst Theatre in San Francisco; the performers were Karen Rosenak and Christopher Jones. Adam Broner wrote a review on the official web site of *Earplay* as follows:

In *Celestial Mechanics* the inside of the piano was amplified, turning simple chords into grand gestures. Repeated notes and long decays spoke to a mesmerizing and internal voyage. And though internal, it prepared us for Crumb’s thoughts on the timbres of space.

The rich palette and elegant language were Crumb’s, but Rosenak and Jones imparted wholeness and shape to their delivery: from noble definition to furtive gestures, thundering chords to scampering notes, with hesitations like the fearful gaze of field mice.

Eastern tonalities in the third movement resolved to uncertain dream shapes in the fourth, evaporating for a lovely finish.⁶⁸

This review provides insight for understanding the main characteristics of the piece as previously mentioned in this study: extreme contrasts in emotion and unusual timbres.

A website created by Adam Bowles, a founding member of the Luna Nova New Music Ensemble and a faculty member at Birmingham-Southern College Conservatory, contains

⁶⁸ Adam Broner, “Earplay at Herbst,” *Repeat Performances* (February 2011), <http://www.repeatperformances.org/preview.php?catid=1&id=314> (accessed April 1, 2011).

several video clips that demonstrate how to deal with extended techniques in Crumb's works.⁶⁹ While the examples are not drawn from *Celestial Mechanics*, it is a useful teaching resource for discussing technical issues such as harmonics, *glissandos*, muted strings, and *pizzicatos*, which are also featured in *Celestial Mechanics*. Bowles's suggestion about creating harmonics will be addressed below when the second movement, "Beta Cygni," is discussed.

To learn *Celestial Mechanics*, the student needs to practice the basic keyboard requirements of the piece, studying the notes and rhythms precisely before implementing the extended techniques. Despite its theatricality, *Celestial Mechanics* is carefully structured. David Cope remarks that *Celestial Mechanics* shows Crumb's "fecundity in idiomatic and coloristic invention, but also contains interesting examples of counterpoint (a rarity in Crumb's music)."⁷⁰ The teacher should help the student understand the formal structure of the piece and point out the places that utilize contrapuntal techniques. The goal is a performance that is both theatrical and formally grounded. The following sections will provide specific pedagogical suggestions for each movement.

I. "Alpha Centauri." The first movement of *Celestial Mechanics*, "Alpha Centauri," is energetic and violent, featuring fast moving repeated notes, strong cluster sounds, and the use of extreme registers. As previously alluded to on page 42 of this study, one can find a good example of this brutal aspect in Bartók's *Allegro Barbaro*. F. E. Kirby describes *Allegro Barbaro* in his book, *Music For Piano: A Short History*, as follows:

This is a frenetic dance featuring driving rhythms, insistent ostinatos, and sharp, percussive, dissonant chords; the melodic structure, based on short but balanced phrases, and the emphasis on the tritone point to the folk background of the piece.⁷¹

⁶⁹ Adam Bowles, "Extended Techniques for Piano," <http://www.lunanova.org/PianoET/> (accessed May 1, 2011).

⁷⁰ Cope, "Biography," 14.

⁷¹ F. E. Kirby, *Music for Piano: A Short History* (Portland, OR: Amadeus Press, 1995), 312.

As *Allegro Barbaro* features aggressive sounds with strong accents, it is an appropriate piece to familiarize the student with the aggressive sound that is also a main characteristic of “Alpha Centauri.” The teacher can introduce the score of *Allegro Barbaro* along with a recording and discuss the main elements of the piece, focusing on its “barbarity.” Because the first thirty-four measures are highly repetitive, this section can be played with a relatively small investment of practice time, but it is sufficient to illustrate the main characteristics described by Kirby in the above quote. The student can then begin to apply a similar brutality to “Alpha Centauri.”

Section I: Beginning to Rehearsal Number 4. The first section has no time signatures or bar lines. It is marked *molto ritmico* (very rhythmic) with a metronome indication of dotted-eighth note equals 60 and sixteenth-note equals 180. The main figures of the first section are rapid repeated notes and strong, aggressive block chords. The pattern for the repeated notes in the beginning of the movement starts with a grace note followed by odd numbers (5, 7, 9, 11) of thirty-second notes. Each pattern starts with a dynamic of *f* and crescendos towards an accented *ffz*. I recommend that the student use one finger (2 or 3) constantly instead of alternating three fingers to play the repeated notes, in order to produce a percussive and mechanical sound. After mastering the notes, rhythms, and dynamics, the student can add the following extended techniques to the first section: striking strings with palm, scraping strings, and muting strings. “Strike strings with palm” first appears at rehearsal number 1 with the *fz* in the secondo after the short passage of repeated notes, and it creates a startling effect. Through clear instruction and demonstration, the teacher needs to help the student become comfortable with those unconventional techniques that require directly touching the strings.

Section II: Rehearsal Number 5 to 13. Two main patterns dominate the second section: cluster chords consisting of seven notes and long passages of repeated notes. These patterns are used with both normal sound and muted sound. When the seven-note chords are played, Crumb suggests that the performer always use the thumb to cover three white notes so that the whole chords can be played with the right hand while the left hand dampens strings with the palm. This section is marked *molto agitato*, but at the same time precise rhythm is required. Practicing slowly with a metronome will help the student achieve rhythmic precision.

Section III: Rehearsal Number 13 to the End. The last section contains two main characteristics previously featured in the first and second sections. The primo uses the same motivic idea found at the very beginning of the piece, consisting of a grace note followed by five thirty-second notes. Then the primo borrows an idea from the second section, utilizing muted and normal sound for repeated notes. The secondo mainly plays block chords that start with *fffz* and progressively diminuendo through *mp*, *pp*, and finally *ppp*. The teacher needs to explain how to attack these chords at each dynamic level: the *fffz* chords should be attacked from a higher distance, and the hands should be brought closer to the keyboard when soft dynamics are required.

II. “Beta Cygni.” The second movement is marked “slowly; *fantastico, quasi improvisando*.” The student needs to bring out fantastic, dream-like effects, and the unique timbres created through harmonics, *pizzicato*, *glissando*, and muted strings. Harmonics are created by touching a nodal point on the string with one hand, simultaneously striking the corresponding key with the other hand. Crumb describes the use of harmonics in his performance notes as follows:

Celestial Mechanics utilizes harmonics of the 2nd, 4th, and 5th partials. The precise nodal points can be indicated by affixing tiny slivers of tape to the strings. The

finger(s) touching the nodes should come off the string(s) immediately after single harmonics or groups of harmonics are struck so that the harmonics ring more luminously.⁷²

Crumb's suggestion about handling harmonics should be carefully discussed and planned between the primo and the secondo. In several places in "Beta Cygni" the right hand of the secondo plays the keys, and the left hand of the secondo and one (or both) hand(s) of the primo create the harmonics. That requires the primo and the secondo to touch and release the nodes simultaneously; thus a proper cue with a physical gesture is needed.

As previously mentioned on page 43, the teacher can use Bowles's demonstration on the harmonics to help the student apply this technique to "Beta Cygni." Bowles discusses the harmonics used in Crumb's *Eleven Echoes of Autumn, Echo I*, and provides the following advice:

It is easiest to mark the spots with either a white crayon or a thin piece of masking tape. The powder of white chalk marks will evaporate with each vibration of the string. It is important to locate the precise spots and mark them carefully in order that the higher harmonic is heard clearly and with resonance. Otherwise, the note played on the keyboard can be made to sound muted and unclear in pitch. This makes tuning the produced harmonic to the actual pitch necessary.⁷³

Bowles's suggested use of a crayon is a very practical alternative to the use of tape.

The next unique timbral device is *glissando*; Kim's suggestion is follows:

As the secondo plays trills on given harmonic notes with the right hand, he/she will lift the fingers off of the strings on grace notes so that the fundamental pitch momentarily emerges; then the 2nd and 4th fingers slide along the given strings to produce a rising-falling *glissando* of various partials.⁷⁴

Unlike the rapid *glissando* over the strings in the third movement, this gradual motion of sliding strings produces an electronic sound effect.

⁷² Crumb, *Celestial Mechanics*.

⁷³ Bowles, "Extended Techniques for Piano."

⁷⁴ Kim, "A Performer's Guide to George Crumb's *Makrokosmos IV (Celestial Mechanics)*."

Both the primo and the secondo utilize *pizzicato* at rehearsal number 15, and then the primo has a passage that requires muted strings. The student needs to pluck the strings using the fingertips according to Crumb's suggestion. Another video clip by Bowles illustrates how to mute the strings. When he demonstrates the technique of muting strings in the "Vocalise" from Crumb's *Vox Balaenae*, Bowles states: "It is most effective to place one finger on the ends of each string closest to the tuning pins. This approach allows for maximum resonance and control of dynamics."⁷⁵

Because "Beta Cygni" has a sparse texture, using these extended techniques properly is essential for timbral variety.

III. "Gamma Draconis." According to Crumb's performance notes, "Three metal rulers (with cork stripping glued to one side) are required for "Gamma Draconis." One of the rulers should be 15 inches in length; the other two, 12 inches in length."⁷⁶ The use of metal rulers produces metallic and nearly "electronic" sounds that dominate the entire movement. The rulers are used to produce new sounds in several different ways: dropping the ruler onto the strings (cork-side down); playing on the keyboard so that the hammers strike the strings from below while the ruler rests on top of the strings; striking the ruler with the fingertips so that the ruler transmits the energy from the finger to the strings; and scraping or dragging the ruler over the strings to produce a *glissando*. All of these techniques contribute to Crumb's musical aim of turning the piano into a new instrument.

"Gamma Draconis" has four sections that are clearly divided according to tempo changes.

⁷⁵ Bowles, "Extended Techniques for Piano."

⁷⁶ Crumb, *Celestial Mechanics*.

Section I: Beginning to Rehearsal Number 26. The first section is marked *molto ritmico, meccanicamente*, very rhythmic and mechanical. The student needs to practice with a metronome to maintain accurate rhythmic patterns. Because Crumb utilizes contrapuntal compositional technique, the student needs to be aware of imitative melodic lines between the primo and the secondo.

Section II: Rehearsal Number 27 to Rehearsal Number 33. The tempo indication changes to *prestissimo*, requiring the execution of fast moving thirty-second notes with several rhythmic variations. The student needs to control extreme dynamic changes in this section: *ppp* to *f*; *f* to *ppp*; *ppp* to a sudden *fff*; and *ffz* moving gradually to *pppp*.

Section III: Rehearsal Number 34 to Rehearsal Number 35. The previous section slows down gradually and leads into the third section, marked *poco languido*. Here, too, extreme contrasts in tempo, dynamics, and emotional approach are found, and again the student needs to utilize various extended techniques to produce sounds such as *pizzicato*, a percussive sound using the knuckles, striking the strings with the hand, and muting the strings with the palm.

Section IV: Rehearsal Number 36 to the End. The concluding section returns to the original tempo of *quasi alla marcia*. Starting at a very soft dynamic, it builds in intensity through a gradual crescendo and a thicker texture. From rehearsal number 42, Crumb invites the page turner to take part in the performance, and the musical medium is expanded to piano, six hands. The page turner is required to employ extended techniques using a ruler to strike and scrape the strings, as described above.

IV. “Delta Orionis.” The last movement can be divided into two sections. The first section reintroduces several motivic ideas from the previous movements with slight variation and

also adds new material. The second section again involves the page turner as it expands to piano, six hands.

Section I: Beginning to Rehearsal Number 48: Fast moving repeated notes as used in the first movement are now played with the extended technique, “mute string,” to create a unique timbral effect. Extreme dynamic changes are required as the student plays a group of block chords on the first page of Section I; after two chords with *fff* there is an indication of *subito ppp* followed by *molto crescendo* to *fffz*. In the next gesture, two *ppp* chords are followed by *subito ff*, and then by a *molto decrescendo* to *pppp*. As discussed in connection with the first movement on p. 45, the teacher needs to explain how to adjust the height of the hands to produce these dynamic contrasts.

Section II: Rehearsal Number 49 to the End: As Shirley Fleming commented in her review, “Breath-holding delicacy” is characteristic of the last section.⁷⁷ Just as Bartók’s *Allegro Barbaro* proved useful as preparation for the first movement of *Celestial Mechanics*, Debussy’s preludes *Voiles* and *La cathédrale engloutie* are relevant to this movement. While *Voiles* helps the student produce a delicate and expressive melodic line, *La cathédrale engloutie* helps the student achieve a delicate and expressive timbre while playing block chords. In his book, *How to Play and Teach Debussy*, Maurice Dumesnil provides a useful technical suggestion on playing the block chords in *La cathédrale engloutie*. When one plays the block chords Dumesnil suggests that “The action must be one of ‘pushing the keys down’ from very close, using both the relaxed wrist and finger joints as soft springs, in order to secure as delicate a tone as possible.”⁷⁸ This technique can be applied to the last section of *Celestial Mechanics* since the primo player is required to play very soft and delicate block chords throughout the section.

⁷⁷ Fleming, “Out of World Pianistic Experience.”

⁷⁸ Maurice Dumesnil, *How to Play and Teach Debussy* (New York: Schroeder and Gunther, Inc., 1932), 18.

The last section is marked *adagio molto* and features percussive effects by the page turner, who is instructed to gently strike the strings.

Use of Recordings

While the student can explore the unusual timbres featured in *Celestial Mechanics* by listening to audio recordings, observing several available video recordings of performances is especially beneficial.⁷⁹ As the piece is theatrical in nature, the student should examine the key elements of staging. Practical insights can be obtained regarding execution of extended techniques, placement of the score for better access to the strings, and proper postures to produce unconventional sounds.

Celestial Mechanics was featured in one of the concerts in the Pendulum New Music series, “George Crumb at 80: A Celebratory Festival,” at the University of Colorado at Boulder in September, 2009. The four movements were played by six pianists, and the official website of Pendulum New Music contains the following comment:

The dynamic, varied piano writing went hand-in-hand perfectly with the constant switching of performers, and the performance provided a visual excitement as well as an aural one. With the dramatic musical action came extremely physical piano playing with a plethora of unconventional practices.⁸⁰

Performances of the first movement, “Alpha Centauri,” and the second movement, “Beta Cygni,” are presented on Pendulum’s website. Hsing-ay Hsu, Artistic Administrator for Pendulum New Music and David Korevaar play “Alpha Centauri.” This video recording allows the student to observe extended techniques such as “strike the strings with the palm of the hand,” “scrape strings,” “mute strings,” and “harmonics.” The primo uses a

⁷⁹ Four currently available performances, by Haewon Song and Robert Shannon, Robert Nasveld and Jacob Bogart, Fuat Kent and Peter Degenhardt, and James Primosch and Lambert Orkis are listed in the bibliography of the present study.

⁸⁰ Pendulum New Music. <http://www.cu-pendulum.com/> (accessed April 1, 011).

high stool (not a conventional piano bench) in order to reach the strings more easily, and the music rack is placed towards the middle of the piano for better access to the soundboard and the strings. Hsu and Korevaar's powerful performance demonstrates the extended techniques used in the first movement as well as the dramatic emotion that Crumb intends to convey through the timbral effect.

Alejandro Cremaschi and Andrew Cooperstock play "Beta Cygni." (They are on the faculty of the College of Music at the University of Colorado, Boulder.) Their performance emphasizes Crumb's characterization of *Celestial Mechanics* as a suite of dances. This means that it should both sound like a dance and even look like a dance. This video will help the student see that careful choreography is required not only to produce the unconventional techniques using the inside of piano, but also to enhance the theatrical aspects of the piece.

Another available video recording of "Alpha Centauri" is played by Stephanie Ho and Saar Ahuvia (DUO), and can be found on Youtube.⁸¹ (They are on the faculty of Concordia College's Conservatory of Music in Bronxville, New York and Kean University in Union, New Jersey). Ho and Ahuvia perform a wide variety of repertoire for both four-hand piano duets and two-piano duos. They performed *Celestial Mechanics* at the concert, "Celebrating George Crumb: A Special Concert to Honor the Composer's 80th Birthday" on January 13, 2010 at Le Poisson Rouge in New York. In their performance video, one can observe an innovative method for placing the score. They open the lid completely, using wires connected to the inside of the lid to suspend the score high enough that they have the space to touch the strings and the

⁸¹ Saar Ahuvia, "Celestial Mechanics- Alpha Centauri," Video clip, 2007, www.Youtube.com, <http://www.youtube.com/watch?v=lMi7wgfIa2g>, (accessed April 1, 2011).

soundboard. This is a very practical way to handle the score for easy access to the strings as well as to keep the score within the performers' sight.

The specific pedagogical suggestions discussed in this chapter will help the student master the technical and musical skills required for a musically informed and collaborative performance of *Celestial Mechanics*. The student's ultimate goal is not simply mastering the extended techniques, but utilizing them in a musical way. The references to works of Bartók and Debussy in particular are intended to underscore Crumb's continuity with earlier twentieth-century piano music.

Coda

Each of the three duets discussed above has introduced the student to a significant aspect of twentieth-century extended technique. Feldman's *Piano Four Hands* introduced a new concept of sound, in which extremely soft dynamics and even silence itself play a central role. Felciano's *Gravities* introduced extended rhythmic complexity, which is nonetheless explainable through references to Hispanic and Latin dance rhythms. Crumb's extended timbral effects in *Celestial Mechanics* treat the piano as a "new instrument."⁸² These three American piano duets thus provide the student and teacher with a rewarding opportunity to explore twentieth-century techniques in a collaborative and creative way. It is hoped that this document will contribute to their future study and performance.

⁸² Cope, "Biography," p. 11.

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