A PRACTICAL APPROACH TO DONALD MARTINO'S TWELVE-TONE SONG CYCLES: THREE SONGS AND TWO RILKE SONGS, FOR PERFORMANCE

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The performance of vocal works using the twelve-tone technique requires thorough study of complex rhythms, non-tonal melodies, non-traditional notations, and specific musical terms. They generally also require advanced and varied vocal techniques. Twelve-tone vocal works often contain unusual features vital to the composer’s intention.

One of the premiere twelve-tone composers in the United States, Donald Martino (1931-2005) composed only two solo vocal works using the twelve-tone technique: *Three Songs* (1955) and *Two Rilke Songs* (1961). He has explored innovative and progressive uses of the twelve-tone technique, and composed music with particular methods of his own, later used by other composers. *Three Songs*, his first twelve-tone work, and *Two Rilke Songs*, the only twelve-tone song cycle in his mature style, present comparable features in his use of the twelve-tone technique, text setting, and notations. The variety of ways in which Martino uses these features in the song cycles is discussed in the performance guide.

The intention of the present study is to help performers, especially singers, understand Donald Martino’s two twelve-tone song cycles, and to aid in the preparation of an excellent performance. The study includes a study of historical context, the poems, and Martino’s compositional and aesthetic approaches to setting them. It also offers practical and systemized ways of analyzing and preparing Martino’s songs for performance. It is hoped that the methods suggested herein will
reduce a singer’s difficulties and rehearsal time with the pianist.

The present study will offer a valuable addition to the literature on the performance practice of twelve-tone vocal music, and provide insight and advice on how to practice and perform other non-tonal music. This method of study may be applied to other contemporary music. Doing so can in turn help develop a singer’s skill in handling tonal and rhythmic difficulties of all kinds, including non-traditional notations.
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CHAPTER 1

INTRODUCTION

Since Arnold Schoenberg initially developed the twelve-tone technique\(^1\) in the early part of the twentieth century, composers worldwide have composed vocal music with this technique. One significant composer, Donald Martino (1931-2005), has explored innovative and progressive uses of the twelve-tone technique, and composed music with particular methods, later used by other composers. This paper aims to demonstrate, through study of Martino’s twelve-tone vocal works, that it can be valuable to explore innovative and practical ways of preparing twelve-tone vocal works for performance, especially in ways that use an understanding of an individual composer’s innovations.

Twelve-tone works often include non-tonal harmony, highly chromatic melodies, and independent rhythmic settings between the vocal and accompanimental parts, and these usually require more rehearsal time and effort to prepare for performance than tonal music of the same length generally does. Because texts are often set in non-literal ways when using the twelve-tone system, transforming whole poetic metaphors into the musical structure, some analytical study of the specific compositional methods used may help a singer to learn the music and understand the text setting. It must be noted that there are very few published articles, books, recordings, or performance guides related to the preparation of twelve-tone works for

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singers. This, and the fact that they generally require rigorous practice, especially for singers who do not have perfect pitch, results in many singers’ reluctance to undertake learning them. Even works by very well known composers, many of which reward the effort, are often, sadly, overlooked.

The intention of the present study is to help performers, especially singers, understand Donald Martino’s two twelve-tone song cycles, *Three Songs* (1955) and *Two Rilke Songs* (1961), and to aid in the preparation of an excellent performance of them. This study provides some historical context for modernist music in the United States before Martino’s first twelve-tone work. It also addresses the period during which Martino composed his twelve-tone vocal works, i.e. 1954 to 1961. It also includes a study of the poems from *Pomes Penyeach* by James Joyce that Martino uses in *Three Songs*, and of the Rainer Maria Rilke poems used in *Two Rilke Songs*. Careful study of the poetry is essential for a successful preparation of the works, because in Martino’s musical setting is tailored to fit the poetry in a unique yet idiomatic way. Some analytical study of Martino’s use of the twelve-tone technique is also advised in order to explore his aesthetic and compositional approaches to text.

This dissertation offers practical and simplified ways to prepare Martino’s songs for performance. It is hoped that the methods suggested herein will reduce a singer’s difficulties and rehearsal time with the pianist. The pianist will gain understanding of Martino’s musical gestures in the piano part from chapter 3, and gain relevant insight for rehearsal from chapter 4. It is also hoped that the present study will offer a valuable addition to the literature on the performance practice of twelve-tone vocal music, and will provide insight and advice applicable to its preparation.

*Three Songs*, Martino’s first twelve-tone work, uses a fully developed twelve-
tone system, which is nonetheless simpler than his mature style. Therefore, it is a suitable first choice for a singer who does not have much experience singing twelve-tone vocal works. *Two Rilke Songs*, Martino’s second and last twelve-tone vocal work, was composed in his mature style, and uses more refined compositional methods and aesthetic approaches to the text. *Two Rilke Songs* requires of the singer more advanced and varied vocal techniques than does the earlier cycle.
CHAPTER 2

DONALD MARTINO AND HIS TWELVE-TONE VOCAL WORKS:

THREE SONGS AND TWO RILKE SONGS

Modern Music in the United States before Martino’s

First Twelve-tone Composition

After World War II, many traditions from Europe and the United States, including scientific, mathematical, artistic, and technological, converged in the practice of musical composition. Technological advances, such as tape recording, led to Musique Concrète. Certain composers who considered music as a reaction to science or as a manifestation of science employed scientific method and study to their musical compositions. Following Arnold Schoenberg’s death in 1951, through Milton Babbitt and his pupils, set theory and group theory, as well as the emerging field of computer science, began to exert a strong influence in the development of the twelve-tone technique as a compositional device. Theorists and some composers used mathematical terminology and symbols, including numbers to identify pitch classes, order numbers, and transpositional levels. Mathematical concepts, such as equivalence and relation, were also applied to the twelve-tone compositions. The

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2 Musique Concrète is music in which electronic technology is used to access, generate, explore, and configure sound materials, and in which loudspeakers are the prime medium of transmission. See Simon Emmerson and Denis Smalley, The New Grove Dictionary: Electro-Acoustic Music, vol. 8, 59-67.


twelve-tone technique developed later into integral or total serialism, a new approach to pitch, dynamics, rhythm, and other musical values.

During the 1940s and 1950s, Babbitt, a mathematician and a student of Roger Sessions, expanded the resources of the twelve-tone system in American music. The concept of combinatoriality, included in Schoenberg’s compositional method, was developed further by Babbitt, who introduced such terms as “pitch class” and “source set” into the musical vocabulary. Schoenberg, in fact, used the technique of combinatoriality, already in the 1920s, and described it without using the term, in his article “Composition with Twelve Tones” in 1941:

I changed my original idea, if necessary, to fit the following conditions: the inversion a fifth below of the first six tones, the antecedent, should not produce a repetition of one of these six tones, but should bring forth the hitherto unused six tones of the chromatic scale. Thus, the consequent of the basic set, the tones 7 to 12, comprises the tones of this inversion, but, of course, in a different order.

Although post-war American and European serial composers strove for the development of serial music, it was not widely performed in the United States during this period. Donald Martino states in his interview with James Boros that in 1948

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5 Integral or total serialism is the use of series for aspects such as dynamics, register, and duration, as well as pitch. See Paul Griffiths, *The New Grove Dictionary: Serialism*, 5. Total Serialism, vol. 23, 122.

6 Combinatoriality is a technique whereby a collection of pitch classes can be combined with a transformation of itself to form an aggregate of all 12 pitch classes. See *The New Grove Dictionary: Combinatoriality*, vol. 6, 167.

7 Pitch class is a set of all pitches that are octaves apart, labeled by an integer. See John Roeder, “Pitch class,” In *Grove Music Online, Oxford Music Online*, http://www.oxfordmusiconline.com/subscriber/article/grove/music/2 1855 (accessed February 9, 2011).

8 Source set is a subset of a tone row that is used to generate the entire row through symmetric transformation. See Larry J Solomon, In *Set Theory Glossary*, http://solomonsmusic.net/setgloss.htm (accessed February 9, 2011).


11 James Boros and Donald Martino, “A Conversation with Donald Martino,” *Perspectives of New Music* 29, no. 2 (Summer, 1991), 214.
there was no National Endowment for the Arts, nor were there any new music ensembles or orchestral residency projects.\textsuperscript{12}

In the early to mid-1950s, performances of serial music became more frequent, “but for the most part,” as Martino describes those performances, “we heard pickup groups saw unknowingly and unfeelingly through works in which they would unashamedly break down on stage, or even worse, unashamedly forge ahead, hopelessly lost. And it was not uncommon to hear this music racing along at half tempo.”\textsuperscript{13} However, also emerging were exceptional performers who undertook and specialized in the performance of new music. These included the Juilliard String Quartet, conductor and composer Jacques Monod, violinist Lewis Krasner, and soprano Bethany Beardslee.\textsuperscript{14}

From this beginning, the number of twelve-tone composers continued to increase in the United States.\textsuperscript{15} During the 1950s and 1960s, twelve-tone music became a prominent genre in performances of new music.\textsuperscript{16}

Donald Martino, Toward the Twelve-tone Composer

Donald Martino, one of the premiere twelve-tone composers in the United States during his lifetime, won the Pulitzer Prize in music for his chamber work\textit{Notturno} in 1974. Martino was himself a clarinet player, and his compositional output consists of fifty-nine instrumental pieces and five choral works. He published only four solo vocal works:\textit{Separate Songs} (1951) for high voice and piano,\textit{From “The Bad Child’s Book of Beasts”} (1952) for high voice and piano,\textit{Three Songs} (1955),

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\textsuperscript{12} Ibid.
\textsuperscript{13} Ibid.
\textsuperscript{14} Ibid.
\textsuperscript{15} Nicholas Tawa,\textit{American composers and Their Public: A Critical Look} (Metuchen, N. J.: The Scarecrow Press, Inc., 1995), 174
\textsuperscript{16} Milton Babbitt, “Some Aspects of Twelve-tone Composition,”\textit{The Score and I. M. A. Magazine} 12 (June, 1955), 54.
originally for bass and piano and revised for high voice and piano, and *Two Rilke Songs* (1961) for mezzo-soprano and piano. *Separate Songs* and *From “The Bad Child’s Book of Beasts”* were composed primarily using the octatonic scale and folk tunes; *Three Songs* and *Two Rilke Songs* were composed using the twelve-tone technique.

Martino’s first composition teacher was Ernst Bacon at Syracuse University. Bacon taught him improvisation and an “American Style” of composition. Most of Martino’s mature music has an improvisatory, free, and spontaneous character that reflects Bacon’s influence. Under the guidance of Bacon and Harwood Simmons, his clarinet teacher at Syracuse University, Martino also studied the music of Béla Bartók and his use of the octatonic scale. From 1951 to 1956, Martino wrote music reminiscent of Bartók. During Martino’s undergraduate years (1948-1952), the music of the Second Viennese School had rarely been performed in the United States, much less in Syracuse, New York. Besides, typical study of music theory in the American university did not yet include the music of the significant modernist composers, such as Schoenberg, Igor Stravinsky, and Paul Hindemith. Martino’s compositional output during this period thus presents characteristics of the common practice style, as can be observed in his *Separate Songs* (1951). It was not until 1954, in his String Trio, that characteristics of the modernist style appear, such as highly dissonant and chromatic atonality, and complex rhythmic and harmonic settings.

After leaving Syracuse University in 1952, Martino went to Princeton

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17 Octatonic scale is a succession of eight notes within the octave in which whole tones and semitones, or semitones and whole tones, alternate. See Stefan Kostka, *Materials and Techniques of Twentieth-Century Music* (New Jersey: Prentice Hall, 1990), 34.
18 Boros, 217.
19 Ibid., 218.
20 Ibid., 214.
University, where he studied with Milton Babbitt for a year. In 1952, Babbitt lectured on the technique of using combinatoriality within the twelve-tone system.\(^{21}\) However, Martino did not yet attempt any twelve-tone composition during that year.\(^{22}\)

At Princeton, he also studied with Roger Sessions for a year. Sessions had recently begun to compose twelve-tone music. It was Sessions’ composition seminar on Schoenberg’s String Trio that aroused Martino’s interest in composers of the highly modernist style.\(^{23}\)

In 1954, on a Fulbright Scholarship, Martino moved to Florence, Italy, where he studied with Luigi Dallapiccola and began to study the compositional methods of Schoenberg and Anton Webern. Webern was Schoenberg’s student, and alongside Alban Berg, one of the members of the Second Viennese School.\(^{24}\) Martino also began to compose completely chromatic twelve-tone works rather than music using the octatonic scale. Most of Dallapiccola’s instruction was in registral distribution. Martino said of his experience with Dallapiccola in Boros’ interview “if he [Dallapiccola] had a bug about anything, it was about cross-relations of the octave…. I’ve had the delightful experience… of looking over some of my old sketches, seeing his red marks, and realizing that he was usually right about where notes connected best, where they seemed freshest, most at home.”\(^{25}\)

As Martino had found to be the case in America, he describes the publication and performance of modernist music in Europe during this period as stagnant.

According to Boros’ interview with Martino, “I went up to Universal Edition in

\(^{22}\) Boros, 218.
\(^{23}\) Ibid., 219.
\(^{24}\) Second Viennese School is the group of composers who worked in Vienna (and Berlin) between 1910 and 1930 under the leadership of Schoenberg. Their music was characterized by atonality and twelve-tone technique. See The New Grove: Second Viennese School, vol. 23, 29-30.
\(^{25}\) Boros, 221.
Vienna, and found that I couldn’t even buy a study score of the Webern Second Cantata; it simply wasn’t in print! I also heard a radio performance from Rome featuring the Schoenberg Variations…. The piece was silenced by boos. It was the Dark Ages.”

Consequently, Martino developed compositional methods based upon the study of common practice music, particularly of Bach, Beethoven, and Brahms, rather than on study of his own contemporaries and immediate predecessors. Specifically, the musical structure and style of his early compositions reflect the model of the past. This is similar to Schoenberg, who in his own estimation developed his methods from study of the common practice tradition, rather than by pursuing radical change.

Martino’s First Twelve-tone Work, Three Songs

In 1955 while in Italy, Martino composed his first published twelve-tone work, Three Songs, which displays a richer handling of the twelve-tone technique than does his String Trio (1954), his primitive twelve-tone work. For the texts, he employed three poems by James Joyce from the collection Pomes Penyeach. Despite the fact that it was difficult to study or hear twelve-tone works in the United States and Italy during the 1940s and the early 1950s, Martino accomplished his study of the twelve-tone technique by experimenting with the octatonic scale in writing the String Trio. Martino had experimented with continuously interlacing one octatonic scale with another, thereafter arriving at row-derived music. Further, by 1955, he had been able to study, in depth, scores and articles by twelve-tone masters such as Dallapiccola and

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26 Ibid., 214.
27 Ibid.
29 Row is a series containing all twelve pitches of the chromatic scale in a specific and predetermined order without repetition of any pitch. See The New Grove Dictionary: Series, vol. 23, 123.
Babbitt, and completed his cycle *Three Songs*.

Dallapiccola partly influenced *Three Songs* in the choice of text as well as compositional technique. Dallapiccola himself had set a text from Joyce’s *Pomes Penyeach* for the first song of *Tre Poemi*, composed in 1949. Martino’s cycle also includes Babbitt’s influence in his use of an all combinatorial first-order source set. Martino’s use of combinatoriality resulted from Babbitt’s lecture at Princeton in 1952, rather than from an examination of the music of Schoenberg, since Martino had just begun to study the music of the Second Viennese School. Babbitt’s article also affected Martino’s use of combinatoriality, which deals with a study of combinatoriality using works of Schoenberg and Webern.

Like Schoenberg and Webern, Martino was interested in combining certain formal aspects of common practice with formal aspects of twelve-tone composition. The presence of common practice techniques may be seen in *Three Songs* by the use of ternary form. For example, in the first song *Alone*, Martino employed rows P-0/ I-8/RI-11/R-0/I-8 for the vocal part, which presents a structure of a-b-a, whereas the music is set in a less strict A-B-A’ form (A and A’ keep the same row forms but register and melodic structure are changed). In the third song, he employed pitch rows

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30 Dallapiccola employs the third poem from *Pomes Penyeach*, “A Flower Given to My Daughter.”
31 All-combinatorial sets are sets whose hexachords are capable of forming an aggregate with any of its basic transformations transposed. The all-combinatorial hexachords are as follows: first-order set type A (0 1 2 3 4 5), B (0 2 3 4 5 7), and C (0 2 4 5 7 9); second-order set type D (0 1 2 6 7 8); third-order set type E (0 1 4 5 8 9); and fourth-order set type F (0 2 4 6 8 10). See Babbitt, “Some Aspects,” 53-61.
33 Nicholls, 77.
35 P: *Prime*, the original set; R: *Retrograde*, the original set in reverse order; I: *Inversion*, the mirror inversion of the original set; RI: *Retrograde Inversion*, the inversion in reverse order; The integer indicates the number of half-steps above the original row, for example, P-1 means transposing one half-step up from the original row, P-0. P-0 indicates the original tone row, using movable ‘do.’ For more basic study on twelve-tone technique, see Stefan Kostka, *Materials and Techniques of Twentieth-Century Music* (New Jersey: Prentice Hall, 1990), 206-230.
P-3/I-11//I-6/P-2//I-10/P-2 for the vocal part which is a-b-a’ form in which a and a’ are symmetrical, transposed by half-step.

Martino’s Twelve-tone Vocal Work, Two Rilke Songs

In the summer of 1956, Martino returned to the United States and taught at the Third Street Music School Settlement in New York, and at Princeton University for a year. In Piano Fantasy, his work for solo piano, 1958, Martino accomplished an important compositional procedure that he called a “circuit of derivations.” A “circuit of derivations” is a process of combining a pitch-class set with one of its own transformations in order to generate another set.36 From this experiment he also discovered that a set returns to the beginning set by continuing the process. Martino began to use this technique more and more frequently in his twelve-tone compositions, and doing so became the starting point for his mature twelve-tone technique.37

From 1959 to 1969, Martino taught at Yale University. While there, he published “The Source Set and Its Aggregate Formations” (1961),38 based on his own examination of twelve-tone technique after 1954. The thesis of this article originates from Babbitt’s Princeton lectures on combinatoriality. The article was also influenced by Babbitt’s article “Twelve-Tone Invariants as Compositional Determinants,”39 published in the preceding year (1960), and Babbitt’s personal help was crucial to the completion of Martino’s article.40 Martino’s purpose in writing “The Source Set and Its Aggregate Formations” was to provide composers with a kind of “dictionary,”

36 Boros, 222.
37 Ibid.
40 Boros, 228.
which he also continued to apply to his own works.41

This article is indicative of Martino’s mature twelve-tone works, including

*Two Rilke Songs*, composed in the same year (1961), which presents a more advanced and fully developed compositional technique than *Three Songs*. According to James Boros’ conversation with Martino, “aggregate harmony”42 is carefully calculated. Yet, Martino always composed with the sense that he could write music “out of any collection of pitch classes” to emphasize certain notes. He used a grid in order to determine a register for each note. This grid was not preplanned.43 Martino often used the improvised grid to compose a whole section of a piece. He would then fill in the spaces between these improvised sections with randomly chosen notes from the same grid until patterns emerged. This principle may be observed in *Die Laute from Two Rilke Songs*, where registral patterns are detected not in one or two measures, but in elongated phrases. For example, from m. 9 to m. 11, the pitch-class F continues to appear in both vocal and piano parts in various registers (see fig. 1). This example shows both the tendency toward a particular tonal center (a practice against the basic premise of twelve-tone composition), and a type of registral pattern that might emerge through improvisation.

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41 Ibid.
42 Aggregate harmony is a set of all twelve pitch classes occurring as a harmonic structure. See *The New Grove Dictionary: Aggregate*, vol. 1, 9.
43 Boros, 257.
Martino’s *Two Rilke Songs* is scarcely mentioned in scholarly literature. However, its significance can be derived from historical context. *Two Rilke Songs* is Martino’s last twelve-tone solo vocal work and the only solo vocal piece composed in his mature style. The cycle embodies the ideas in his article, “The Source Set and Its Aggregate Formations,” after which Martino was considered a master of twelve-tone technique. One would not predict such an outcome ten years earlier, if Martino’s own comments are to be believed:

> When I came back to this country [1956], I continued to study the material and to gather data, which I began to try to apply in my pieces. Unfortunately, those pieces were dismal failures! You can hear every three notes go by…. Everything was over-articulated…. But those painful, frustrating years during which I laboriously probed such paradoxes of craft and concept taught me a very great deal.  

*Two Rilke Songs* includes various influences obtained from his education. Italian characteristics are observed, for example, in a registral distribution influenced by Dallapiccola, and Italian-language musical terms that Dallapiccola employed in his vocal works, such as in *Goethe Lieder* (1953) and *Cinque Canti* (1956). The

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44 Ibid., 228.
characteristics of Italian vocal writing for a lyrical vocal quality, such as melismas and appoggiaturas, are also observed, especially in the first song, “Die Laute.”

German influences include a choice of text by one of the most significant German poets of the early twentieth century, Rainer Maria Rilke, whose poetry had also been set in many significant works before Martino, including the music of the Second Viennese School composers, such as Schoenberg’s Vier Lieder, Op. 22, and Webern’s Zwei Lieder, Op. 11. Martino’s dedication on the title page, “A Memory of Robert Schumann,” reflects one of Schumann’s vocal works, Zwölf Lieder, with texts by Justinus Kerner. Schumann set Kerner’s poem “Lust der Sturmnacht” as the first song and his “Alte Laute” as the last song in Zwölf Lieder, whereas in Two Rilke Songs, Martino selected Rilke’s “Die Laute” as the first and his “Aus einer Sturmnacht VIII” as the last. Kerner’s two poems present similar subjects to Rilke’s, but there is a different viewpoint. Kerner depicts a stormy night in “Lust der Sturmnacht” as releasing from pain and finding joy, whereas in Rilke’s “Aus einer Sturmnacht VIII,” a stormy night evokes his dead sister. In Kerner’s “Alte Laute” a narrator concludes that only death can release him from his depression, in which old lute sound symbolizes his memory of happiness. In Rilke’s “Die Laute,” the lute can be interpreted as the poet himself or as a sexual symbol. The use of the term Sprechstimme is derived from Schoenberg. Babbitt’s technique of combinatoriality is also used.

Martino’s Influence on His Pupils

From 1969 to 1981, Martino was Chairman of the Composition Department at the New England Conservatory of Music. He later also taught at Brandeis and

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Harvard.

As a teacher, Martino influenced many significant composers of the next generation. Among them, William Hibbard studied with Martino at New England Conservatory. Brian Fennelly, Stephen Mosko, Phillip Rhodes, and Jan Bach studied with him at Yale. Peter Lieberson and Steven Mackey studied with him at Brandeis.

In the field of twelve-tone vocal composition, Martino’s influence may be seen in, among other works, *Rilke Songs* by Lieberson (b.1946), composed in 2001 and also set for mezzo-soprano and piano. Lieberson studied with Martino at Brandeis University from 1981, receiving instruction in composition and Harmony. Lieberson described his experience with Martino:

In class, [Martino] led us through the study of hexachords, their intervallic make up, their trichordal generators…. Within the phrase itself, within a group of phrases, the material could be structured such that the original hexachord itself contained the seeds of modulation to other hexachords…. The method of transformation was not superimposed on the music but came from within the music itself, inseparably.

Martino was a composer who had always been a performer, and a teacher who has had an impact on both students and colleagues. During his career, he won many awards and distinctions, including two Fulbright scholarships, three Guggenheim fellowships, the Classical Critics Citation, and grants from the National Institute of Arts and Letters.

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CHAPTER 3

MARTINO’S AESTHETIC AND COMPOSITIONAL
APPROACHES TO THE TEXTS

James Joyce (1882-1941)

Martino employed three poems from the collection *Pomes Penyeach* by James Joyce for the texts of *Three Songs*. Joyce, an Irish writer and poet, is considered one of the greatest and most influential writers of the twentieth century. Most of his works contain musical imagery in which his attention to sound and rhythm is omnipresent. Because of the opportunities in Joyce’s poems for effective musical treatment, many twentieth century composers have set Joyce’s poems. These include Samuel Barber, Luciano Berio, Pierre Boulez, John Cage, and Luigi Dallapiccola.

*Pomes Penyeach* is a miscellaneous collection of thirteen poems, written over a twenty-year period from 1904 to 1924. It was published in 1927 by Shakespeare and Co. for the price of one shilling (twelve pennies). The title of the collection is a play on words “poems” and *pommes* (“apples” in French), which are offered at “a penny each.” It was the tradition for Irish tradespeople of the time to offer their customers a “tilly” (*tuilleadh* in Irish, meaning “more than”), or an extra serving, as in a “Baker’s dozen.” The first poem of *Pomes Penyeach* is entitled “Tilly,” representing the extra offering of this penny-a-poem collection.

For the song cycle *Three Songs*, Martino selected three poems: “Alone”

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50 Adam Krims, “Some Analytical Comments on Text and Music in Martino’s ‘Alone,’” *Perspectives of New Music* 29, no. 2 (Summer, 1991), 357.
written in Zurich in 1916, “Tutto è sciolto” written in Trieste in 1914, and “A Memory of the Players in a Mirror at Midnight” written in Zurich in 1917.

The poet in “Alone” depicts his forbidden love with a scene from nature, using such metaphors as “a veil” and “whisper” (symbolizing the secret nature of his love), and imagery such as the moon’s effect on vision, suggesting isolation and pensiveness. By recalling “her name” in the middle of the second stanza, the descriptive natural scene links to the psychological state of the narrator, who is thinking about the ‘missing woman,’ his secret love. His memory of this love brings him great pleasure, but he says that it is a “shame.” The absent woman is the cause of the shame, because their love is forbidden.

Martino employs a particular sonority in the piano part in order to express the metaphor of the poet’s memory of secret love. The recurring chord B♭ - A - B - G♯ represents the high point of the piano prelude of “Alone,” and first appears in m. 4. It is shown to be the high point by the fact that Martino employs the dynamic marking, forte, for the first time here, and employs the longest rhythmic value used thus far in the song. As the phrase approaches this chord, Martino expands the registers and increases the rhythmic activity. This recurring tetrachord appears throughout the song, in mm. 4, 5, 19, 20, 22, 24-25, 25-26, and 27 (see fig. 2), frequently emerging after “her name” (m. 18), at which point the narration shifts from the description of nature to psychological reflection.

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51 Ibid., 364.
In “Tutto è sciolto,” the narrator describes a memory of unfulfilled love. The narrator evokes his loneliness and memory of love in the first stanza, again using a scene of nature, with such phrases as “a birdless heaven” and “one lone star.” In the second stanza, the narrator describes an image of his love as shy and delicate (“clear young eyes”). As the title “Tutto è sciolto” (all is broken) suggests, the narrator implies a separation between present and past by recalling the memory of his past love. Martino’s musical setting also suggests this metaphor. He employs a broken harmonic structure in the piano part, using arpeggios rather than simultaneous vertical sonorities. Also, he uses three different tone rows horizontally at the same time in mm. 1-3, 11-16, and 22-25. Figure 3 shows how he employs the order number\(^52\) 0 to 5 of

\(^{52}\) Order number is used for twelve pitches of every set are numbered in order beginning with zero. See Larry J Solomon, In Set Theory Glossary, http://solomonsmusic.net/setgloss.htm (accessed February 9, 2011).
P-2, R-1, and P-4 simultaneously in m. 1 to the first half of m. 3, followed by the order number 6 to 11 of P-4 in the second half of m. 3.

Figure 3. Three Songs, “Tutto è sciolto,” mm. 1-3

The poet’s unfulfilled love is also expressed by a falling gesture in the vocal melody, especially for the words “falling” (m. 17), “lures” (m. 24), “yielded” (m. 27), and “sigh” (m. 28) (see fig. 4).

Figure 4. Three Songs, “Tutto è sciolto,” a falling gesture:

“A Memory of the Players in a Mirror at Midnight” describes sexual activity in a brothel. Unhealthy love is described through rhymes with fricative consonants in the first stanza, such as “gnash,” “lash,” and “flesh,” and “teeth” and “breath.” The narrator warns himself not to get involved in this harmful place. He uses commands (“Lash your itch and quailing, nude greed of the flesh”). At the end of the second stanza, “pluck forth your heart” is a command to himself to resist temptation.

Martino uses several musical devices to describe the expressive poetry of the third song. The piece starts with a plucking gesture in the piano part, which is indicated marcato, often employing a tremolo and widely spaced chords with strong
dynamics (see fig. 5).

Figure 5. Three Songs, “A Memory of the Players in a Mirror at Midnight,” mm. 1-3

The vocal part begins with a whispering voice on the text “they mouth love's language. Gnash the thirteen teeth your lean jaws grin with.” He also emphasizes most of the tritones in the vocal melody in order to highlight the biting quality of the text. In mm. 22-23, Martino reorders the tone row I-6 and employs a rest in order to emphasize the tritone between “Lies not” and “stark skin” (see fig. 6).

Figure 6. Three Songs, “A Memory of the Players in a Mirror at Midnight,” mm. 21-23

Rainer Maria Rilke (1875-1926)

Martino composed Two Rilke Songs on texts by Rainer Maria Rilke, a Bohemian-Austrian poet, writer, and art critic. Rilke is considered one of the most significant lyric poets of modernist Germany, and a transitional figure between traditional and modernist poets.⁵³ Although he did not have formal musical training, his works contain musical elements in the tone of the vowels, the rhythm, and the

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general spoken pattern. The most important collections of Rilke include Das Buch der Bilder (1898-1906), Das Stundenbuch (1905), Neue Gedichte (1907-1908), Die Sonette an Orpheus (1923), and Duineser Elegien (1923).

Rilke’s poetry had been set in significant works by many composers, including Schoenberg’s Vier Lieder, Op. 22, from the collection Das Stundenbuch; Webern’s Zwei Lieder, Op. 8, from Aus dem Nachlaß; Hindemith’s Das Marienleben, Op. 27, from Das Marien-Leben; Hindemith’s Six Chansons from Vergers; and, later, in works set by Peter Lieberson, Darius Milhaud, George Perle, and Edward Staempfli.

During Rilke’s Paris period (1902-1910), he was deeply associated with the sculptor Auguste Rodin. Through studying and writing about Rodin, Rilke learned the value of objective observation, which transformed his writing style from the subjective to the objective. This style would prove to be innovative in European literature at that time. Rilke attempted constantly to visualize and express intangible images with tangible things, through which he created Dinggedichten (thing-poems). In other words, he expressed sound in visual terms of concrete “Dinge” (things) and substance. For example, an instrument (lyre or lute), as a concrete object, is a visible symbol of musical sound in his poetry. Rilke also often employs figures, such as Apollo, Hermes, and Orpheus, from Greek mythology as recurring motifs. These are found in, among other collections, Die Sonette an Orpheus published in 1923.

The text of the first song in Martino’s Two Rilke Songs, “Die Laute,” is from

56 Ibid., 29.
one of Rilke’s best-known collections of the Paris period, Der neuen Gedichte anderer Teil (Another Part of the New Poems) (1908), which was written in the objective style, and is considered Dinggedichten (thing-poems). Der neuen Gedichte anderer Teil is highly delicate in the use of language and poetic form as a shaped and shaping material, in which the poems are often said to be ‘things’ in themselves.\(^{58}\)

Generally, Rilke employs visible objects in nature to express musical sound, such as water and plant imagery, in his poetry.\(^{59}\) The image of the tree appears in the first stanza of “Die Lautle,” “einer reifen gewölbten Feige” (a ripe full-bodied fig), which also symbolizes the female sexual organ.

In “Die Lautle,” the visible instrument, the lute, may symbolize the poet Rilke, who creates the lyric poetry, in which the strings of the lute are visible symbols of musical sound. However, the lute can be also interpreted as a sexual object. The performance on the lute by Tullia is a sexual action, compared in the last stanza to performing duets. Rilke uses a figure, Tullia d’Aragona (c. 1510-1556), a Venetian courtesan in the sixteenth century, in order to complete this metaphor.\(^{60}\) Often, Martino arranges the twelve tones vertically, shared between the vocal and piano parts, which depict a sensual interminglement between a lute and its player, suggestive of sexual activity.

Martino’s musical setting in “Die Lautle” mostly depicts the lute. As the lute symbolizes musical sound, music itself represents the lute in this song. Especially, the piano part imitates the sound of the lute in arpeggios, sometimes with grace notes or

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\(^{58}\) Metzger, 29.

\(^{59}\) Brewster, 398.

\(^{60}\) Tullia d’Aragona is a courtesan, Roman writer, and philosopher. See Lisa Curtis-Wendlandt, “Conversing on Love: Text and Subtext in Tullia d’Aragona’s Dialogo della Infinità d’Amore.” Hypatia 19, no. 4 (Autumn, 2004), 77-98.
staccato articulation, and rhythmic figures that emulate the articulation of a lute (see fig. 7).

Figure 7. *Two Rilke Songs*, “Die Laute,” mm. 1-3

The text of the vocal part describes the shape of the lute, its sound, and its player from the lute’s point of view. The melody of the vocal part interacts intimately with the piano part. The vocal melodies frequently mimic melodies and motions of the piano part. For example, both parts continue to play or sing trichords of the same sonorities, (0 1 5) and its inversion (0 4 5), but with various formations and registral distributions in mm. 12-14 (see fig. 8); and the vocal melody in m. 17 (see fig. 9-a) imitates the piano melody from mm. 15-16 (see fig. 9).

Figure 8. *Two Rilke Songs*, “Die Laute,” mm. 12-14

In the normal order form, (0 1 5) represents a trichord consisting of a half-step followed by a major third, and (0 4 5) consisting of a major third followed by a half-step.
In “Die Laute,” Martino depicts certain words with the twelve-tone technique, and others with a more traditional manner of text-painting. For example, in m. 17, “Übertreib” (overstate) is set with a redundancy of the pitches A and B in the piano part, illustrating the word esoterically through a detail of the twelve-tone construction. On the other hand, the large melismatic leaps in the vocal part present a more traditionally illustrative representation of the concept of “overstating” (Übertreib).

The phrase from mm. 18 to 20 presents a symmetrical melodic construction, the first hexachord consisting of major 3rd + major 3rd + minor 3rd + tritone and the second hexachord of tritone + major 3rd + major 3rd + minor 3rd (see fig. 19, page 34). The text also shows a symmetrical aspect, starting with the word “Dunkel” (dark) and ending with “Dunkelheit” (darkness). In m. 36 Martino switches the order number 9 (F-sharp) with the number 10 (G-sharp) in order to depict the word “Schwäche” (weakness). By switching the order numbers, the tone row (P-3) briefly makes a falling gesture in the music, illustrating the idea of ‘weakness’ (see fig. 10), much the
same as can be found in tonal music.

Figure 10. Two Rilke Songs, “Die Laute,” mm. 36

The text of the second song, “Aus einer Sturmnacht VIII,” is from Rilke’s series, *Aus einer Sturmnacht (From the Stormy Night)*, written in 1901 in Berlin-Schmargendorf. The series is from the second part of the second book of a collection entitled *Das Buch der Bilder (The Book of Images or Paintings)* (1899-1906). The collection consists of individual poems and cycles of poems, in which the voice is mostly the poet himself, who observes and describes creatures and objects. The 1906 edition of *Das Buch der Bilder* is divided into four sections of two books with two parts each. The central themes of the first part of Book I are loneliness, death, longing, perception, and childhood. The second part of Book I presents a mood of melancholy and alienation. Book II includes varied subject matter and ideas. Part 1 of Book II presents the theme of man’s heritage, fate, perception, and mission in the world. The second part of Book II presents tragic figures, such as a widow, a leper, a dwarf, and the blind, in which the main themes are death and perception.\(^{62}\)

* Aus einer Sturmnacht* is a series of nine poems, consisting of a title page

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\(^{62}\) Patricia Pollock Brodsky, “Russia in Rilke’s Das Buch der Bilder,” Comparative Literature 29, no. 4 (Autumn, 1977), 315-316.
(Titelblatt) and eight numbered poems. On the title page, the poet faces a stormy night. Human inadequacy on a cosmic scale is measured by a metaphor between a raging storm and self知识. Each of the other eight poems in Aus einer Sturmnacht begins with the same phrase, “In solchen Nächten” (during such nights), in which the narrator is connected to different situations with the powerful storm. Conflating life and death, the series ends with “Aus einer Sturmnacht VIII” with a reference to Rilke’s dead sister who died before he was born.

Martino’s musical setting of the second song is quite different from the first song. Its musical form reflects a secco recitative in which the piano part plays chords and the voice part sings a narrative of subdued memory rather than an emotional statement. The dissonant chords, marked sforzando and “echo-tone,” depict the sound of thunder on a stormy night. As a means of text-painting, Martino employs various musical terms, such as mormorevole and parlando in the vocal part, and “echo-tone” in the piano part, to convey the meaning of the text. He also uses several articulations, such as staccato on the text “ganz klein” (so small) for describing the little sister, and dynamic markings varied from to to create an ambivalent picture of the stormy night and the narrator, who recalls memories of his dead sister. Martino does not use the twelve-tone technique in “Aus einer Sturmnacht VIII” as a means of text-painting, as he does in “Die Laute.”

As the musical settings present, Martino depicts poems both with the twelve-tone technique, and with a more traditional manner of text-painting. The former includes a use of the recurring sonorities or intervals, and a simultaneous use of

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63 Metzger, 122.
64 In Rilke’s childhood, his mother called him Sophia as compensation for the loss of her baby daughter, and forced him to wear girl’s clothes until he was five.
several tone rows to express certain metaphors as, for example in figure 3, p. 16. He often repeats a succession of pitches to illustrate certain words esoterically through a detail of the twelve-tone construction. He reorders tone rows and switches order numbers for the same purpose. This way of text-painting, using the twelve-tone technique, is mostly unnoticeable to listeners. The latter, more traditional text-painting approach, includes the use of various musical gestures and dynamic marks, and extended vocal effects, such as mormorevole, parlando, and whispering voice.
CHAPTER 4

PERFORMANCE GUIDE

Martino’s pieces have specific challenges that, when broken down into smaller steps, are more accessible and easier to learn. These challenges include complexity of rhythm, chromaticism, large leaps, and non-traditional notations and sound effects. The following exercises are given in order to facilitate the learning process and make it more enjoyable.

Complex Rhythmic Figures

Most pieces composed with twelve-tone technique include highly complex rhythmic figures, and the individual rhythmic settings between the various parts increase the textural complexity. In complex and abstract music, composers have generally seen it necessary to pursue an exact and precise rhythmic language. Therefore, study of complex rhythms prior to singing is required. This study is part of advanced rhythmical training. Additional exercises are given in this chapter to aid the learning process, and these exercises can be applied to other twelve-tone vocal works as well. The techniques in these exercises also make rehearsing more effective when joining with the pianist.

Since Martino employed relatively complex rhythms in the vocal melodies of Two Rilke Songs, rhythmic exercises for the vocal part in this section are mainly derived from “Die Laute,” Two Rilke Songs.

After learning the rhythms on one’s own, the next and very necessary step for

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the singer is to practice the correct rhythms together with the piano part. This should be done before learning the pitches. Much twelve-tone music presents frequent meter-changes. Therefore, performers should mark the down beats in every measure of both voice and piano part, so that the pulse of the piece is always recognizable. Figure 11 shows an exercise for complex rhythms by vocalizing rhythms using neutral syllables, such as “ta ta” or “du du.” Numbers represent rhythmic values of quarter note, eighth note, sixteenth note, and thirty-second note. Rhythmic values are given in each line before the numbers i.e. \(\frac{1}{4}, \frac{1}{8}\), etc.

Figure 11. Two Rilke Songs, “Die Laute,” mm. 17-18:

Step 1. Find the common rhythmic value in either voice or piano part, and write beat numbers in every measure. The common rhythmic value in 3/4 and 2/4 is a quarter note (\(\frac{1}{4}\) = 1, 2, 3) which is inserted above each measure in the score.
Step 2. If a given passage presents a complexity such that there is no obvious common rhythmic value, for example, the second beat in m. 17 and the third beat in m. 18, divide it into smaller rhythmic values, eighth notes, sixteenth notes, or thirty-second notes.

Step 3. Practice subdividing the written rhythms into the smallest rhythmic values (thirty-second notes) from step 2 until rhythms can be counted with only the common rhythmic value (quarter notes).

Once one becomes accustomed to counting complex rhythms using a neutral syllable, one should read the text in the written rhythm, and then gradually increase the speed, if necessary. Practice the rhythm in this way until the text can be recited with a steady beat in the correct tempo. This is a technique often used in the preparation of rhythmically complex tonal music as well.

Chromatic Melodies/Pitch Organization and Large Leaps

Overview

Learning pitches in twelve-tone works can present a great challenge for singers without perfect pitch because they include non-tonal harmonies, highly chromatic melodies, and independent harmonic and melodic settings between vocal and accompaniment parts. There are several studies and exercise books for practicing intervals and atonal harmonies and melodies that aid singers in obtaining a general sense of intervals, which could also be applied to twelve-tone vocal music. However, this section offers another approach to learning melodies using an analytical study of Martino’s own use of twelve-tone technique. The performance practice for learning

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melodies in this section mainly consists of four processes: 1) Deriving ordered sub-sets from the analytical study; 2) Learning those sub-sets; 3) Practicing transposed and permuted sub-sets; and 4) Applying the specific examples to other, similar passages.

For an analytical study geared toward learning Martino’s melodies, his article “The Source Set and Its Aggregate Formation”\(^\text{67}\) provides helpful guidance. According to his article, Martino was interested in partitioning the twelve-tone row into trichords (3-note chords), tetrachords (4-note chords), and hexachords (6-note chords). There is a tetrachordal partitioning in *Three Songs* (it may also be partitioned into two hexachords, but I use the tetrachordal partitioning because it is more practical for the exercises), and a trichordal and hexachordal partitioning in *Two Rilke Songs*. This partitioning is the main source for melodic exercises in this section.

*Three Songs*

As Martino’s first twelve-tone work, the *Three Songs* is simpler than his mature style. The vocal melody of all three songs is made of transformations of the same basic row. The basic row can be partitioned into three tetrachords as seen in the first two measures of the first song: two type-A all-combinatorial tetrachords and one type-E all-combinatorial tetrachord (see fig. 12 and 12-a).\(^\text{68}\)


\(^{68}\) All-combinatorial tetrachords: first-order type A (0 1 2 3), B (0 2 3 5), C (0 2 5 7), and D (0 1 2 7); second-order type E (0 1 6 7); third order type F (0 3 6 9); and type S (0 1 3 6) is also transpositionally combinatorial, but cannot be inverted onto itself. See Martino, 237.
Figure 12. *Three Songs*, opening of “Alone,” mm. 1-2:

RI-8: E - G - F - G♭ - G# - A - E♭ - D - A# - B - D♭ - C

![Musical notation image]

Figure 12-a. *Three Songs*, “Alone,” partitioning of RI-8:

Tetrachordal partition: E - G - F - G♭ / G# - A - E♭ - D / A# - B - D♭ - C

\[
\begin{align*}
X &: (0 \ 1 \ 2 \ 3) & \text{type-A} \\
Y &: (0 \ 1 \ 6 \ 7) & \text{type-E} \\
Z &= X^{46}: (0 \ 1 \ 2 \ 3)^{69} & \text{type-A}
\end{align*}
\]

Figure 12-a shows that type-A tetrachord consists of semitones (0 1 2 3) and type E of semitones (G# - A and E♭ - D) and a tritone (A - E♭). These intervals and sonorities are the basis for the construction of the vocal melodies in *Three Songs*.

Based on figure 12-a, the vocal melodies in *Three Songs* can also be partitioned into three tetrachords.

Figure 13 presents the tetrachordal partitioning of the beginning of the vocal melodies from each of the three songs, containing the first twelve pitches (0 to 11), and reducing leaps over an octave to the same pitches within an octave. This revoicing into close position aids in learning, and is less tiring to the voice than repeatedly practicing large leaps.

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\[ X=Y^{4a} \]: X and Y: collections of pitch classes; t: transposed; a: an integer, a number of half-steps. See Ibid., 271.
Figure 13. *Three Songs*, opening tone rows:

“Alone” (P-0)

\[
\begin{align*}
X \text{ (type A)} & & Y \text{ (type E)} & & Z \text{ (type A)} \\
\end{align*}
\]

“Tutto è sciolto” (RI-7)

\[
\begin{align*}
Z & & Y & & X \\
\end{align*}
\]

“A Memory of the Players in a Mirror at Midnight” (P-3)

\[
\begin{align*}
X & & Y & & Z \\
\end{align*}
\]

Figure 14 includes interval exercises on four possible ordered forms (P, R, I, and RI) of each tetrachord, X, Y, and Z. Since all of the vocal melodies in *Three Songs* are composed with tone rows in order, a training of all (0 1 2 3) and (0 1 6 7) tetrachords can be constantly applied to any vocal melodies even though one or two pitches from a set are overlapped with a following set and are sometimes not in order.

Figure 14. *Three Songs*, tetrachordal exercises:

Exercise 1. Practice ordered sub-set forms of X tetrachord (0 1 2 3) separately which includes half steps and whole steps. Sing each tetrachord in different transpositions:

\[
\begin{align*}
P & & R & & I & & RI \\
\end{align*}
\]
Exercise 2. Practice Z tetrachord (0 1 2 3) as in exercise 1. Z tetrachord includes half steps, whole steps, and minor thirds:

<table>
<thead>
<tr>
<th>P</th>
<th>R</th>
<th>I</th>
<th>RI</th>
</tr>
</thead>
</table>

Exercise 3. Practice ordered sub-set forms of Y tetrachord (0 1 6 7) separately which includes half steps and tritones. Sing each tetrachord in different transpositions:

<table>
<thead>
<tr>
<th>P/R</th>
<th>I/RI</th>
</tr>
</thead>
</table>

Exercise 4. After practice exercise 1 to 3, sing combined sub-sets as a twelve-tone set (see below). Sing twelve-tone sets in different transpositions:


Exercise 5. Sing twelve-pitch sets as they appear in the melody, but with the leaps reduced within the octave.
Exercise 6. Sing *Three Songs* in the written rhythm, but still with the leaps reduced, on one vowel, such as /i/ or /o/, suitable for a precise tuning.

Exercise 6-a. Repeat with text instead of single vowel.

Exercise 7. Sing the vocal line on one vowel with the written melody in its original octave and in the written rhythm, but without the text.

Exercise 7-a. Repeat with text instead of single vowel.

*Two Rilke Songs*

Martino discussed his compositional method in Boro’s interview, stating that his mature style was accomplished partly through writing the article “The Source Set and Its Aggregate Formation” in 1961, when *Two Rilke Songs* was also composed. Therefore, the cycle presents his mature compositional system examined in his article, which is a more advanced approach to the twelve-tone technique than is used in *Three Songs*, including the technique of reordering trichordial mosaics.

Martino employed separate tone rows for each song: type-B (0 2 3 4 5 7) all-combinatorial hexachord for “Die Laute,” and type-D (0 1 2 6 7 8) all-combinatorial hexachord for “Aus einer Sturmnacht VIII.”

Figures 15 and 16 present derivations of recurring intervals and sonorities of the first twelve pitches from each song. Figure 15-a shows the opening of “Die Laute” where the first twelve pitches are organized into two hexachords, a tritone apart from each other, and each of which consists of two trichords, containing a major third and semitone, (0 4 5) and its inversion (0 1 5).

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70 Boros, 227-228.
71 Martino, 245-256.
Figure 15. *Two Rilke Songs*, opening of “Die Laute,” mm. 1-2:

P-6: \(G - E_b - F - A_b - G_b - B_b / E - D - C# - A - B - C\) : Type B \((0 \ 2 \ 3 \ 4 \ 5 \ 7)\)

![Musical notation](image)

Figure 15-a. *Two Rilke Songs*, “Die Laute,” partitioning of P-6:

Hexachordal partition: \(G - E_b - F - A_b - G_b - B_b / E - D - C# - A - B - C\)

\[a:(0 \ 2 \ 3 \ 4 \ 5 \ 7)\] \[b=\text{transposed } (0 \ 2 \ 3 \ 4 \ 5 \ 7)\]

Trichordal partition: \(G - E_b - F / A_b - G_b - B_b / E - D - C# / A - B - C\)

\[a:(0 \ 4 \ 5)\] \[b=a^{\text{transposed}}:(0 \ 1 \ 5)\] \[c:(0 \ 4 \ 5)\] \[d=c^{\text{transposed}}:(0 \ 1 \ 5)\]

Figure 16-a shows the first twelve pitches of the vocal part in “Aus einer Sturmnacht VIII” which are divided into two hexachords, each of which includes two trichords. The first hexachord consists of two \((0 \ 4 \ 5)\) trichords, and the second hexachord of two \((0 \ 1 \ 5)\) trichords. Each pair of identical trichords is a tritone apart. According to Martino’s article, type-B and type-D hexachords can be derived by systematic operation upon the same trichord, \((0 \ 1 \ 5)\) \((\text{see fig. 15-a and 16-a})\):

\[\text{both type-B and type-D are partitioned into the same trichords, } (0 \ 1 \ 5) \text{ and its inversion } (0 \ 4 \ 5).\]

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72 + means ‘inverted.’ See Ibid.,271.
73 Ibid., 228-229.
Figure 16. Two Rilke Songs, opening of “Aus einer Sturmnacht VIII,” mm. 1-5:

P-0: D - C# - A - E♭ - A♭ - G / E - C - B - F - B♭ - G♭; Type D (0 1 2 6 7 8)

Figure 16-a. Two Rilke Songs, “Aus einer Sturmnacht VIII,” partitioning of P-0:

Hexachordal partition: D - C# - A - E♭ - A♭ - G / E - C - B - F - B♭ - G♭

\[ a: (0 1 2 6 7 8) \quad b = a^{13}: (0 1 2 6 7 8) \]

Trichordal partition: D - C# - A / E♭ - A♭ - G // E - C - B / F - B♭ - G♭

\[ a: (0 4 5) \quad b = a^{16}: (0 4 5) \quad c: (0 1 5) \quad d = c^{16}: (0 1 5) \]

Martino employed various kinds of pitch organizations for the vocal melody in “Die Laute”: a hexachordal or trichordal partition of the original row; a trichordal derivation\(^\text{74}\) from multiple inversions or transpositions of the row forms in order to produce another set, which creates the tone row used in the second song, “Aus einer Sturmnacht VIII.” A reordered segment of tone rows is used to emphasize certain sonorities, and to create the tone row of the second song, “Aus einer Sturmnacht VIII,” however, simply includes two forms of the row in order, P-0 and RI-8, for the vocal melody.

The following twelve-tone rows (figures 17 through 19) represent Martino’s

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\(^{74}\) Derivation is the creation of new sets or rows by combining sub-sets from different source sets. See Stefan Kostka, *Materials and Techniques of Twentieth-Century Music* (New Jersey: Prentice Hall, 1990), 213-214.
particular use of the twelve-tone sets in the melodies from *Two Rilke Songs*, each of which is followed by interval exercises, reducing leaps over an octave to the same pitches within an octave in order to aid in learning.

Figure 17. *Two Rilke Songs*, “Die Laute,” mm. 4-9, hexachordal partition (P-0):

Exercise 8. Practice a sub-set consisting of whole tones, (0 2 4).

Exercise 9. Practice sub-sets consisting of a whole step and half step, (0 1 3) and its inversion (0 2 3).

Exercise 10. Practice a tritone between two hexachords (0 6).

Exercise 11. Sing all sub-sets in different orders and transpositions, permuting them vocally.

Exercise 12. Sing twelve-tone rows as they appear in the melody, but with the leaps reduced within the octave.
Figure 18. *Two Rilke Songs*, “Die Laute,” mm. 12-14, a trichordal derivation from several pitch-class sets, producing R-2 of “Aus einer Sturmnacht VIII”:

(0 1 5) from I-1  (0 1 5) from I-6  (0 4 5) from P-2  (0 4 5) from R-8

Figure 18-a. *Two Rilke Songs*, “Aus einer Sturmnacht VIII,” mm. 3-6, 10-12, 6-9:

mm. 3-6 and 10-12: P-0

(0 4 5)  (0 4 5)  (0 1 5)  (0 1 5)

mm. 6-9: RI-8

(0 4 5)  (0 4 5)  (0 1 5)  (0 1 5)

Exercise 13. Practice a recurring sonority: (0 1 5) and its inversion (0 4 5).

Exercise 14. Sing all sub-sets in different orders and transpositions, permuting them vocally.

Exercise 15. Apply exercise 10 for tritones between the identical trichords.

Exercise 16. Sing twelve-tone rows as they appear in the melody, but with the leaps reduced.

39
Exercise 17. Practice an augmented triad, (0 4 8).

Exercise 18. Practice an augmented triad with a minor 3rd, permuting them vocally, and apply exercise 9 for tritones.

Exercise 19. Sing twelve-pitch rows as they appear in the melody, but with the leaps reduced.

Exercise 20. Sing *Two Rilke Songs* in the written rhythm, but still with the leaps reduced, on one vowel, such as /i/ or /o/, suitable for a precise tuning.

Exercise 20-a. Repeat with text instead of single vowel.

Exercise 21. Sing the vocal line on one vowel with the written melody in its original octave and in the written rhythm, but without the text.

Exercise 21-a. Repeat with text instead of single vowel.

For a more thorough examination of aural skills in twentieth-century music, Michael L. Friedmann’s *Ear Training for Twentieth-Century Music* is useful. It includes musical examples and exercises, with explanations on each, of dyads.

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trichords, tetrachords, etc. Also, Michael R. Rogers’ *Teaching Approaches in Music Theory* provides a pedagogical approach to music theory which is also helpful for performance.  

These references may be valuable for further study of other vocal works using the twelve-tone technique. Several software programs for the training of aural skills, such as *Practica Musica*®, may be helpful in obtaining a sense of interval and pitch.

**Large Leaps**

Together with the study of chromatic melodies, specific experience with singing large leaps is required. There are large leaps—as large as a minor thirteenth—in the *Two Rilke Songs*, for example, C₄ to A₃ in m. 6 of “Aus einer Sturmnacht VIII.” Before practicing such large leaps, one should understand the physical differences in the body that are applied to low or high pitches, chest or head voice, and train them separately.

Low pitch is produced primarily by the thyroarytenoid muscle. Thyroarytenoid-Dominant Production (TDP) is the manner in which the vocal folds oscillate. During TDP, the vocal folds are thickened by contraction of the thyroarytenoid muscle. Therefore, the area of contact between the folds is wide, and glottal closure is rapid and prolonged. As a result, one may produce vocal sounds with strong energy. The female chest voice can be achieved by practicing a short descending scale from F₄ to B₃ during which the *primo passaggio* (the first register pivotal point, shifting the middle to chest voice) occurs. When singing F₄, use middle

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79 Ibid.
voice (standard vocal technique for the comfortable register), for which the thyroarytenoid muscle is off. When singing B₃, use the chest voice, for which the thyroarytenoid muscle is on. To shift from middle to chest voice, the vowel must be modified to a more closed position. Also, breath pressure should be carefully modulated. In addition, the scale should be sung with a single vowel, such as /i/, /e/, or /u/, without moving the position of the tongue and head. This exercise is for using the thyroarytenoid muscle and for strengthening it.

In contrast with TDP, high pitches are produced and controlled through the contraction of the cricothyroid muscle. Cricothyroid-Dominant Production (CDP) is that in which the cricothyroid muscles elongate and thin the vocal folds, increasing the laryngeal pressure. Therefore, the area of contact between the folds is narrow and glottal closure is slow. To achieve head voice above the *secondo passaggio* (the second register pivotal point, shifting the middle to the head voice), which is in the range from E₅ to A₅, vowel modification is required. Vowel modification may be achieved by rounding the lips toward the open version of /o/ (for female voice) and dropping the jaw. With vowel modification, the larynx should be lowered by dropping the jaw and lifting the soft palate as in yawning.

Together with these exercises for each register, singing large leaps may be attained by connecting TDP and CDP. The following exercise (figure 20) will show how these practice methods may be applied to an example from the *Two Rilke Songs*:

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80 Ibid., 72.
81 Ibid., 66.
82 Vowel modification is to increase amplitude, improve sound quality, and produce sound easier. See Ibid., 46.
Figure 20. *Two Rilke Songs*, “Aus einer Sturmnacht VIII,” mm. 6-7:

Step 1. Sing the interval between “vor” on C and “starb” on F, C with the chest voice and F with middle voice. Apply the practice for the *primo passaggio* above.

Step 2. Sing “und” on D-flat, “mir” on A-flat, and “starb” on A-flat, all with head voice. Apply the practice for the *secondo passaggio* between “und” and “mir”. The consonant /t/ should be sung on pitch, and laryngeal position should be maintained for /ʃt/. Reduce air flow between “mir” and “starb.”

Step 3. Connect those four pitches only with the vowels /u/-/o/-/a/-/a/, respectively, using vowel modification and breath support. Keep the larynx low. Connect the pitches with the text. Maintain laryngeal position for the consonants /t/, /ʃ/, and /ʃt/.

*Sprechstimme* and Speaking Voice

In “Aus einer Sturmnacht VIII” from *Two Rilke Songs*, Martino employs *Sprechstimme* for the last three measures, indicated *parlando*. *Sprechstimme* refers to an Expressionist vocal technique between singing and speaking, which first appeared in the melodrama *Königskinder* by Engelbert Humperdinck in 1897, but it is more closely associated with Arnold Schoenberg.\(^8^3\) Schoenberg first employed *Sprechstimme* in the part of the Speaker in *Gurre-Lieder* in 1911, and throughout

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Pierrot Lunaire in 1912. Since Martino’s twelve-tone compositions were influenced by Schoenberg’s works, it is illuminating to read Schoenberg’s intention for performing Sprechstimme, which he presents in the Preface to the first printed edition of Pierrot Lunaire from 1914:

The melody given in the Sprechstimme by means of notes is not intended for singing. The task of the performer is to transform it into a speech-melody, taking into account the given pitch. This is achieved by:

I. Maintaining the rhythm as accurately as if one were singing, i.e. with no more freedom than would be allowed with a singing melody;
II. Becoming acutely aware of the difference between singing tone and speaking tone: singing tone unalterably stays on pitch, whereas speaking tone gives the pitch but immediately leaves it again by falling and rising. However, the performer must be very careful not to adopt a singsong speech pattern. That is not intended at all. Nor should one strive for realistic, natural speech. On the contrary, the difference between ordinary speaking and speaking that contributes to a musical form should become quite obvious. But it must never be reminiscent of singing.⁸⁴

Applying Schoenberg’s instructions, Sprechstimme in Martino’s “Aus einer Sturmnacht VIII” should be performed so that the vocal line is not sung; pitch should be attained and then immediately left by falling or rising from it; and the rhythm should be maintained. In addition, both the immediate abandonment of the notated pitch with speech-like declamation and unnoticeable vibrato are also required. Sprechstimme is like reciting a poem with more resonance produced from the vocal folds than usual, or like singing with less vibrato than usual. Either vibrato or straight tone is determined by laryngeal tension; a tensed larynx causes straight tone; and a relaxed larynx causes vibrating tone.⁸⁵ The same registral divisions should be used in the singing of notated pitches as for the production of Sprechstimme: chest-middle-head voice. However, the ratio of glottal closure for Sprechstimme is lower than that

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⁸⁵ McCoy, 110-113.
of singing in each register. In other words, air consumption increases in Sprechstimme. Therefore, more breath support is required to project audible sound with speech-like quality. The following exercise is for learning Sprechstimme in Martino’s piece (see fig. 21).

Figure 21. Two Rilke Songs, “Aus einer Sturmnacht VIII,” mm. 13-15:

Step 1. Sing (rather than speak) the written pitches with the appropriate sound manner, chest voice\(^{86}\) for C\(_4\), B\(_3\), and A\(_3\), and middle voice\(^{87}\) for A\(_4\) and F\(_4\). Use a sustained tone.

Step 2. Then, relax the vocal folds with more air and produce a more speech-like declamation, retaining the pitch. At the same time, leave the pitches by falling or rising to the next pitch.

Step 3. Close the vocal folds completely on the word “frein” for the portamento.

For the beginning of “A Memory of the Players in a Mirror at Midnight” from Three Songs (see fig. 22), Martino employs a whispering voice that gradually shifts to full voice. This should be performed differently than Sprechstimme.

\(^{86}\)Thyroarytenoid-Dominant Production (TDP). See McCoy, Your Voice, 65.
\(^{87}\)Cricothyroid-Dominant Production (CDP). See Ibid., 66.
Figure 22. *Three Songs*, “A Memory of the Players in a Mirror at Midnight,”
shifting from whispering to full voice, mm. 5~8:

The notated pitches in this phrase are not meant to be sung. Rather, the
notation indicates rhythmic values. There is no falling or rising between words,
making it different from *Sprechstimme*. To produce an audible whispering sound over
a piano accompaniment, a singer needs to exaggerate every consonant to a fricative or
affricative sound, and consume much air, because the ratio of glottal closure for
whispering is lower than that of speaking.\(^88\) It is important to whisper with a greater
intensity of air on a higher pitch than normal whispering, and often close to the range
of voice indicated. A crescendo from the word “lean” to a full speaking voice on “grin
with,” gradually shifts the whispering to resonating sound, and decreases air
consumption. The full speaking voice is somewhat similar to *Sprechstimme* in that the
rhythm is maintained as accurately as in singing, and a speech-like declamation with
unnoticeable vibrato is required.

**Special Notations and Indications in Two Rilke Songs**

Much twentieth-century music presents new symbols and specific indications
in order to notate articulation, tempo, pitch, and duration, and to produce special
sound effects. It is important to express these musical notations with the correct sound
because they are vital to the composer’s intention. It would be most helpful if the

\(^{88}\) McCoy, 119-120.
composer could be present to demonstrate these effects. However, in most cases the composer is not available while the performer learns new music. In those cases, one must be creative in the research of performance practice. If it is a recent work, advice may be gained from someone who has performed under the composer’s supervision. Recordings supervised by the composer can also be useful.

Martino employs several symbols of notation in the *Two Rilke Songs*, such as \( \ddot{\cdot}, \dddot{\cdot}, \dddot{\cdot}, \dddot{\cdot}, \) and ‘\( \downarrow \)’ in the 5-line staff to indicate *Sprechstimme*, which is the most common indication in modern usage. Mostly, new symbols in the vocal part are used to emphasize and express certain words clearly in an atonal setting. Martino also employs new symbols in the piano part, such as \( \overset{\text{fed.}}{\ddot{\cdot}}, \overset{\text{fed.}}{\dddot{\cdot}}, \), to create special musical effects and moods. There is a note with instructions for \( \dddot{\cdot}, \dddot{\cdot}, \dddot{\cdot}, \overset{\text{fed.}}{\dddot{\cdot}}, \overset{\text{fed.}}{\dddot{\cdot}} \) and \( \overset{\text{fed.}}{\dddot{\cdot}} \) on the first page of *Two Rilke Songs*.\(^8^9\)

According to both his article “Notation in General- Articulation in Particular”\(^9^0\) and his note in the score, \( \dddot{\cdot} \) means a slight *ritenuto* by holding the note a bit longer than its notated value, which is mostly notated together with the dash, \( \dddot{\cdot} \) (see fig. 23). \( \dddot{\cdot} \) is performed expressively with a weak attack, followed by a crescendo, or increase in sound, i.e. \( \dddot{\cdot} \).

Figure 23. *Two Rilke Songs*, “Die Laute,” m. 18

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\(^8^9\) Donald Martino, *Two Rilke Songs* (Ione Press, 1970), notes.
\(^9^0\) Martino, “Notation in General-Articulation in Particular,” *Perspectives of New Music* 4, no. 2 (Spring-Summer, 1966), 47-58.


\( \uparrow \) means accented with an incisive and crisp attack, like a strong beat, and is usually set on an unstressed beat; it changes the pulse of the phrase. \( \uparrow \) means unaccented, and is articulated between \( \uparrow \) and \( \uparrow \), like a weak beat. \( \uparrow \) usually precedes \( \uparrow \), so that the \( \uparrow \) mark can be more emphatic. In other words, text with the \( \uparrow \) mark can be more accented (see fig. 24).

Figure 24. Two Rilke Songs, “Die Laute,” m. 23

\[ \text{\textbf{\textit{war nicht so}}} \]

\( \uparrow \uparrow \) specially marked on high notes with soft dynamics, such as \textit{p} or \textit{pp}, indicates the quality of vocal sound that produces a glassy and flageolet-like tone without vibrato, similar to a harmonic for string instruments (see fig. 25). This technique also depicts the text shown in figure 25, illustrating the word “Saal” (room), by using the technique to produce a hollow sound, suggesting the space of a room.

Figure 25. Two Rilke Songs, “Die Laute,” m. 26

\[ \text{\textbf{\textit{heller Saal}}} \]

In the piano part, \textit{Ped.} means lifting the damper pedal gradually, and \textit{Ped.} means a swift down-up-down motion of the damper pedal, producing an echo-tone (see fig. 26).
Apart from these symbols, Martino provides specific musical terms for the vocal part in *Two Rilke Songs* that provide particular expressive qualities. The cycle contains Italian characteristics influenced by Luigi Dallapiccola, and uses musical terms for the particular vocal techniques examined in chapter 2. Dallapiccola’s vocal works include identical vocal techniques to those of Martino’s. These can be applied when practicing the appropriate sounds for Martino’s works. Recordings of Dallapiccola’s works currently exist, whereas recordings of Martino’s vocal works do not. The author is preparing a recording of them to accompany this paper.

In the beginning of “Die Laute,” Martino instructs that the vocal melody is to be sung with *colla bocca semichiusa* (with the mouth almost closed) for the text “Ich bin die Laute” (I am the lute) and *aperta* (open) in the following measure (see fig. 27). The musical instruction *a bocca semichiusa* is also found in *An Mathilde* by Luigi Dallapiccola (see fig. 28).

![Figure 27. Two Rilke Songs, “Die Laute,” mm. 4-6](image)

This phrase with *colla bocca semichiusa* should be sung as in humming, but not with a completely closed mouth and more open space in the pharynx. The singer should almost close the mouth, keep an even and narrow space, and use a more nasal sound than in standard singing, although less nasal than *momorevole* (murmuring). Dallapiccola’s musical example should be practiced first because it is set to a single vowel and follows a normal singing sound. The change from a normal singing sound to a sound with an almost closed mouth is noticeable in the example by Dallapiccola. For Martino’s piece, a singer should enunciate the text with an exaggerated and clear use of consonants.

Martino applied *momorevole* to the text “schon seither” (since that time) in “Aus einer Sturmnacht VIII (see fig. 29).”

Although sound effects produced from *colla bocca semichiusa* and *momorevole* are analogous, the vocal technique for *momorevole* is different from the technique for *colla bocca semichiusa*. To sing with murmuring, a singer should make space inside the mouth, lifting the soft palate, with relatively small and rounded lips, and more nasal sound than *colla bocca semichiusa*. This murmuring voice should be
gentle and subdued, and consonants should be articulated minimally. Recordings of *Cinque Canti* and *Goethe Lieder* by Dallapiccola provide a good reference for performers for several of the indications found in Martino’s scores.

**Rehearsal with an Accompaniment**

The step following individual study will be rehearsals with the accompaniment, piano in this case. The first rehearsal should be run at a slow and steady tempo without any tempo fluctuation, i.e. leave out the marked ritardandi and accelerandi. During rehearsal with the piano, a singer should continually check the pitches of the voice part against the pitches in the accompaniment, especially in passages where the beats of both voice and piano parts are aligned. Careful listening to the piano part when the voice part has rests is especially important, because the piano pitches between rests can help the singer find the following pitch in the voice part. After several rehearsals, the singer and pianist should work on musical indications, such as tempo changes, dynamic markings for text-painting, and special sound effects. Lastly, preludes and interludes in atonal music frequently contain harmonic progressions that can cause difficulty in hearing the following vocal entrance. Therefore, it is important to listen to preludes and interludes separately, and practice entrances apart from continuing on with the phrases.

To perform a twelve-tone work, extra efforts are required. However, this music will greatly reward such effort. Following these guidelines will make all the difference between a vague and muddy performance, and one with a clear and transparent sound and an expressive impact.
CHAPTER 5

CONCLUSION

Donald Martino’s compositional output primarily consists of instrumental and choral pieces. However, his twelve-tone vocal works for solo voice, *Three Songs* and *Two Rilke Songs*, contain several significant features essential for a singer’s further understanding and examination of twelve-tone vocal works in general. Both cycles are based on compositional methods developed by Luigi Dallapiccola, Milton Babbitt, and Arnold Schoenberg. Dallapiccola’s influence is noticeable in *Two Rilke Songs* in terms of registral distribution and Italian-language musical terms that Dallapiccola also employed in his vocal works during that time. Martino employs combinatoriality in *Three Songs* and *Two Rilke Songs*, which resulted from Babbitt’s lectures at Princeton, and also from a study of Babbitt’s article “Some Aspects of Twelve-Tone Composition,” published in 1955. The use of *Sprechstimme* in *Two Rilke Songs* is derived from a study of Schoenberg’s works. Martino’s music in general was also influenced by Ernst Bacon’s instruction and the Second Viennese School’s twelve-tone technique. Therefore, historical examination will deepen one’s understanding of major compositional methods used in context, and also of Martino’s compositional innovations based on them.

Many singers conjecture that twelve-tone compositions simply present a series of pitches without expressive meaning, which are complicated and uninteresting to boot. However, by understanding Martino’s compositional methods and musical settings, one may derive essential knowledge for performance and find the expressive
qualities in his music, both for oneself and for one’s audience. In Martino’s twelve-tone song cycles, certain selected pitches of a tone-row are used for text-painting; whereas tonal music expresses meaning through harmony, melody, or tonal relationship. Although these song cycles are atonal, they also present a tonal effect through repeated pitches in both piano and vocal parts, which requires the interaction between singer and pianist in order to emphasize those pitches. Special sound effects and dynamic markings through non-traditional notations, such as ′ and \( \text{Ped.} \), also depict and highlight the text and phrase. Extended vocal techniques, such as *colla bocca semichiusa*, *mormorevole*, and *Sprechstimme*, can help a singer explore his or her own instrument, and discover unfamiliar realms of vocalism and expression. Also, because there are few published recordings, articles, performance guides, or books related to the preparation of twelve-tone works for singers, it is necessary to add one’s own interpretation to the piece (for example, experimenting with vocal character), which may allow for the development of individual performing personalities.

The study of performance practice and an appropriate pedagogical approach not only helps a singer shorten the time that it takes to learn the score, but also allows performers to interpret musical notations with the correct sounds. These are vital to the composer’s intention. This method of study should also be applied to other contemporary music. Doing so will in turn develop the singer’s skill in handling tonal and rhythmic difficulties of all kinds, as well as non-traditional notations.
APPENDIX

NOMENCLATURE AND COMBINATORIALITY
Nomenclature

The analysis in this dissertation uses “movable-do” pitch-class integer notation, whereby the first pitch of the pitch-class set is numbered 0. The terms “prime,” “retrograde,” “inversion,” and “retrograde inversion” are abbreviated in certain figures as “P,” “R,” “I,” and “RI.” The integer after each form indicates the number of half-steps above the original row, for example, P-1 means transposing one half-step up from the original row, P-0.

Combinatoriality in Three Songs

Combinatoriality is a technique whereby a collection of pitch classes can be combined with a transformation of itself to form an aggregate of all 12 pitch classes. In Three Songs, Martino employs tetrachordal combinatoriality. The basic row (P-0) is derived from the beginning of the vocal melody in “Alone,” E - E♭ - F - F# - D - C# - G - G# - B♭ - B - A - C. P-0 is partitioned into three tetrachords, E - E♭ - F - F#, D - C# - G - G#, and B♭ - B - A - C.

(P-0): X (type-A) Y (type-E) Z (type-A)

Both tetrachords, E - E♭ - F - F# and B♭ - B - A - C, are type-A first-order all combinatorial tetrachords (E - E♭ - F - F# = E♭ - E - F - F# = 0, 1, 2, 3 and B♭ - B - A - C = A - B♭ - B - C = 0, 1, 2, 3). D - C# - G - G# is a type-E second-order all combinatorial tetrachord (D - C# - G - G# = C# - D - G - G# = 0, 1, 6, 7) (see A.1).
The term ‘first order’ indicates that combinatorial relationships are created at one transpositional interval. ‘Second-order’ set possesses two such interval levels and ‘third-order’ set possesses three levels. S-type is also transpositionally combinatorial, but cannot be inverted onto itself.

Table A.1. All Combinatorial Tetrachords

<table>
<thead>
<tr>
<th>Type</th>
<th>Order no.</th>
<th>Type-A</th>
<th></th>
<th></th>
<th>Type-B</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Type-C</th>
<th></th>
<th></th>
<th></th>
<th>Type-D</th>
<th></th>
<th></th>
<th></th>
<th>Type-S</th>
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<td>8, 9, 10, 11 (8)</td>
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<td></td>
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<td>8, 10, 1, 3 (8)</td>
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<td></td>
<td>0, 1, 3, 6</td>
<td>4, 5, 7, 10 (4)</td>
</tr>
</tbody>
</table>
Combinatoriality in *Two Rilke Songs*

Martino employs hexachordal combinatoriality with separate tone rows, type-B and type-D, for each song in *Two Rilke Songs*.

The basic row (P-0) in “*Die Laute*” is C# - A - B - D - C - E - B♭ - A♭ - G - E♭ - F - G♭, which is partitioned into two hexachords, C# - A - B - D - C - E and B♭ - A♭ - G - E♭ - F - G♭.

(P-0):

These source sets are type-B first-order all combinatorial hexachords (C# - A - B - D - C - E = A - B - C - C# - D - E = 0, 2, 3, 4, 5, 7 and B♭ - A♭ - G - E♭ - F - G♭ = E♭ - F - G♭ - A♭ - B♭ = 0, 2, 3, 4, 5, 7) (see A.2).

“Aus einer Sturmacht VIII” is written with the basic row, D - C# - A - E♭ - A♭ - G - E - C - B - F - B♭ - G♭, which is partitioned into two hexachords, D - C# - A - E♭ - A♭ - G and E - C - B - F - B♭ - G♭.

(P-0):

They are type-D second-order all combinatorial hexachords (D - C# - A - E♭ - A♭ - G = C# - D - E♭ - G - A♭ - A = 0, 1, 2, 6, 7, 8 and E - C - B - F - B♭ - G♭ = E - F - G♭ - B♭ - B - C = 0, 1, 2, 6, 7, 8) (see A.2).
There are six all-combinatorial source sets. The ‘first order’ sets are created at one transpositional interval; ‘second-order’ set possesses two such interval levels; ‘third-order’ set possesses three levels, and ‘fourth order’ possesses six levels.

Table A.2. All-Combinatorial Hexachords

<table>
<thead>
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<tbody>
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<tr>
<td>Type-B</td>
<td>0, 2, 3, 4, 5, 7</td>
</tr>
<tr>
<td>Type-C</td>
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<tr>
<td>Second-order</td>
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</tr>
<tr>
<td>Type-D</td>
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<tr>
<td></td>
<td>9, 10, 11, 3, 4, 5 (9)</td>
</tr>
<tr>
<td>Third-order</td>
<td></td>
</tr>
<tr>
<td>Type-E</td>
<td>0, 1, 4, 5, 8, 9</td>
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<tr>
<td></td>
<td>6, 7, 10, 11, 2, 3, 6, 7 (6)</td>
</tr>
<tr>
<td></td>
<td>10, 11, 2, 3, 6, 7 (10)</td>
</tr>
<tr>
<td>Fourth-order</td>
<td></td>
</tr>
<tr>
<td>Type-F</td>
<td>0, 2, 4, 6, 8, 10</td>
</tr>
<tr>
<td></td>
<td>3, 5, 7, 9, 11, 1 (3)</td>
</tr>
<tr>
<td></td>
<td>5, 7, 9, 11, 3, 5 (5)</td>
</tr>
<tr>
<td></td>
<td>7, 9, 11, 1, 3, 5 (7)</td>
</tr>
<tr>
<td></td>
<td>9, 11, 1, 3, 5, 7 (9)</td>
</tr>
<tr>
<td></td>
<td>11, 1, 3, 5, 7, 9 (11)</td>
</tr>
</tbody>
</table>

Type-B and type-D can be derived by systematic operation upon the same trichord, (0, 1, 5). For example, type-B, 0, 2, 3, 4, 5, 7, is generated from (0, 1, 5) and its inversion (0, 4, 5) [(2, 3, 7) − 2 = (0, 1, 5) and (0, 4, 5)]. Type-D, 0, 1, 2, 6, 7, 8, is generated from two of (0, 1, 5) [(1, 2, 6) − 1 = (0, 1, 5) and (0, 7, 8) − 7 = (5, 0, 1) = (0, 1, 5)].
Type-B  
$(2, 3, 7) = (0, 1, 5)$

Type-D  
$(0, 7, 8) = (0, 1, 5)$
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