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Heteroglossia: Novella For Orchestra

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Graduate Program in Music

A thesis submitted in partial fulfillment of the requirements for the degree in Doctor of Philosophy

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HETEROGLOSSIA: NOVELLA FOR ORCHESTRA

(Thesis format: Monograph)

by

Andrzej Janusz Tereszkowski

Graduate Program in Music (Composition)

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Abstract

*Heteroglossia (Novella for Orchestra)* explores a non-programmatic musical narrative which seeks to juxtapose Spectral, late-Romantic, and 12-tone aesthetics. The work is structured into seven distinct chapters which utilize Fibonacci numbers and tilings of the golden proportion to create the proportions of the work. The underlying conceptual foundations (and title) of the work are intrinsically related to the concepts of *dialogism*, *polyphony* (in the novel), and *heteroglossia* found within the literary theories of Mikhail Bakhtin. The work is also heavily influenced by theories of narratology and semiotics found in the writings of Jean-Jacques Nattiez and Jean Molino. The discussion document outlines how these concepts are applied in the music, while also providing a summation of the history, aesthetics, and techniques of Spectral composition and outlining the use of late-Romantic triadic transformations, microtonal variance based upon the harmonic series, as well as referential passages found within the work.

Keywords

Acknowledgments

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Heteroglossia
novella for orchestra

Andrzej Tereszkowski
2014/15

Ca. 16' 30'
Orchestra

2 Flauti
   Oboe
Corno Inglese
2 Bb Clarinetti
   Fagotto
   Contrafagotto

4 Corni
2 C Trombe
2 Tromboni
   Trombone Basso
   Tuba

Timpani (32", 28", 25", 23")
Percussione (Gran Cassa, Gong, Campanelli)
   Arpa
   Pianoforte

Violini I
Violini II
Violini III
Violini IV
   Viole I
   Viole II
Violoncelli I
Violoncelli II
Contrabassi I
Contrabassi II

Ca. 16' 30"
Performance Notes

Ca. 16' 30''

Transposing Score

Glissandi are to be performed for the entire duration of the note

Gradually Shift From One Mode of Playing to Another

Heteroglossia makes use of microtones to tune the partials of the harmonic series of various fundamentals. The following chart illustrates the accidentals used throughout the composition to approximate the partials:

<table>
<thead>
<tr>
<th>Tone Type</th>
<th>Variance</th>
<th>Sharp Accidental</th>
<th>Flat Accidental</th>
<th>Accidental if note is already sharp</th>
<th>Accidental if note is already flat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 tone</td>
<td>ca. 100 cents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/4 Tone</td>
<td>ca. 50 cents</td>
<td>b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/5th Tone</td>
<td>ca. 40 cents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/6th Tone</td>
<td>ca. 33.3 cents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/8th Tone</td>
<td>ca. 25 cents</td>
<td>etc...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/16th Tone</td>
<td>ca. 12.5 cents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A semitone equals 100 cents, a 1/4 tone equals 50 cents, a 1/5 tones equal 40 cents, etc. When these microtones are used, the performer can adjust their tuning to approximate the partials of the harmonic series, this is achieved through alternate fingerings, embouchure tuning, playing partials as harmonics, and tuning the partials on the strings.

Strings

S.T.           Sul Tasto
S.P.           Sul Ponticello
E.S.P.         Estremamente Sul Ponticello: as close to the bridge as possible
N               Normal, return to normal bowing
(String Name/Partial) When natural harmonics are utilized, the string name and partial are provided. Ex. (C/11) indicates the 11th partial on the C String
2. Part 2: Heteroglossia (Novella for Orchestra):
Juxtaposing Spectral, Late-Romantic, and 12-tone
Aesthetics to form a Musical Narrative

2.1. Chapter 1, I. Introduction

The conceptual foundations and title of Heteroglossia (Novella for
Orchestra) are intrinsically related to the literary and narrative theories of Mikhail
Bakhtin as expressed in his 1934 essay “Discourse in the Novel.”¹ The work
uses the Fibonacci series and tilings of golden proportions to generate both the
structure and the formal outline, as well as to generate rhythmic material, the
exact parameters of which are documented in section II of Chapter 1: “Use of the
Fibonacci Series and the Golden Proportion”. The work centres around the
juxtaposition and integration of Spectral, 12-tone, and late-Romantic aesthetics.
Thus, section I of Chapter 2 provides an account of spectral aesthetics, history,
and techniques: Section II provides an account of the use of microtonal variance
and the harmonic series within Heteroglossia: and Section III outlines the use of
neo-Riemannian triadic transformations found within the work. Bakhtin’s writings
on the dialogic work, polyphony in the novel, and heteroglossia all influenced the
composition at various levels, and Chapter 3 explores these central concepts in
Bakhtin’s writing. The concepts of the dialogic work and heteroglossia form the
core of the composition; Bakhtin believed that the dialogic framework actually
governs all language and thought, since anything that anyone expresses is a
response to the past and in anticipation of the future. There are literally infinite
variations that may be applied to past forms and techniques; to quote the slogan

of the preeminent music scholar and composer Heinrich Schenker “\textit{semper idem sed non eodem modo.}”\textsuperscript{2} Chapter 4 is dedicated to the analysis of \textit{Heteroglossia} and explores the harmonic structure of the work, referential passages, the use of twelve-tone techniques, as well as other techniques utilized within the composition. In addition to Bakhtin’s writings, the work is also influenced by theories of \textit{narratology} and \textit{semiotics}, which are documented in section I of Chapter 5; section II of chapter five provides a conclusion.

2.2. Chapter 1, II. Use of the Fibonacci Series and the Golden Proportion

Golden proportions and Fibonacci numbers are well established throughout nature and are frequently used by humans. Tibor Bachmann and Peter J Bachmann write of these proportions in nature and architecture:

\begin{quote}
...[t]he sunflower has twenty-one clockwise and thirty-four counterclockwise spiral. Other plants, as well as the hydrogen atom, the bee hive, and many other forms of nature are similarly constructed on a Fibonaccian sequence. The structural measurements of the Parthenon are based upon the Golden-Mean relationships.\textsuperscript{3}
\end{quote}

Although golden proportions have long been used in architecture, sculpture, and painting, their use in instrumental music “…\textit{has [also] been found to be the formal basis of practically all the first movements (in sonata-form) of Mozart’s and of Beethoven’s piano sonatas and string quartets, and of Beethoven’s and Brahms’s}

\textsuperscript{2} “Always the same, but never in the same way.”

Perhaps the best known example of the use of Fibonacci numbers and the Golden Proportion can be found in the works of Bela Bartók. Bartók had a fascination with pine cones and sunflowers, both of which adhere to golden proportions, yet “...he never explained this fascination, although he endeavoured to express through his music that artistic creation follows the rules of nature.” Ernő Lendvai’s seminal work Bartók Dramaturgidja (1964) proved the use of Fibonacci series in Bartók’s Sonata for Two Pianos and Percussion as well as in the first movement of his Music for Strings, Percussion, and Celesta. Thus, the use of the golden proportions in music has a well established tradition.

In order to structure the narrative of the work, the golden proportion was utilized to split the composition into seven distinct chapters. Example 1 shows how the formal and structural outlines of Heteroglossia were created by using the Fibonacci series and tilings of the golden proportions. Formally, the first, third, and seventh chapter are composed using spectral techniques, while the second, fourth, and sixth chapters contain late-romantic, triadic material. The fundamental(s) that occur during the spectral sections are provided. Chapter five, which occurs at the Golden Proportion of the work, represents the climax where both principles are employed.

The proportions of the chapters to one another also adhere to golden proportions: the ratio of the first chapter to the second chapter is 144” : 89”, thus

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5 Tibor Bachmann and Peter J. Bachmann: 73.
chapter two begins at the Golden Proportion of the first 233”; similarly, the ratio of the first two chapters to the third chapter is 233” : 144”, with the beginning of the third chapter occurring at 233”, the Golden Proportion of the first 377”; the same proportions govern the ratio of chapters one - three to chapter four (377” : 233”), chapters five to six (144” : 89”), and chapters five and six to chapter seven (233” : 144”). The diagram shown serves as a guide to the proportions of the work, however, during the composition process the proportions have changed slightly to suit the music.

Example 1: The Formal/Structural Outline of Heteroglossia.

Fibonacci numbers are not only used to design the structural proportions of the work, they are also used to help generate and shape much of the rhythmic materials throughout the piece. In example 2 (mm. 9 - 11), the arpa has been tuned to C, D, E, F#, G, Ab and Bb (the scale approximates partials 8 - 14 of the C harmonic series, without microtonal variance). A glissando is composed out which increases by elements of the Fibonacci series; the first glissando contains
three notes, the next five notes, then eight, thirteen, and twenty-one before contracting in a palindromic manner back to three notes.

Example 2: *Heteroglossia*, mm. 9-12. A glissando in the arpa that increases by elements of the Fibonacci series.

Example 3 (mm. 23-25) shows the use of Fibonacci numbers to generate rhythm. There is an accent on every sixteenth note that falls on a Fibonacci number; violino I plays thirty-four sixteenth notes, violino II plays twenty-one, violino III plays thirteen, and violino IV plays eight. The process is reversed midway through m. 23; violino IV plays twenty-one sixteenth notes, violino III plays thirteen, violino II plays eight, and violino I plays five. This generates a rhythmic canon, with entrances occurring on Fibonacci numbers; violino I enters on beat one, violino II enters on beat two, violino III enters on beat three, and violino IV begins on beat five.
**Example 3:** *Heteroglossia*, mm 23-25. A rhythmic canon using Fibonacci numbers.

While many of the rhythms and textures apply rigorous theoretical concepts, much of the work is composed free of these restrictions to ensure that a sense of spontaneity still exists in the compositional process. Some of the theoretical concepts, such as the use of Fibonacci numbers to generate complex rhythms, were considered from a practical point of view. The theoretical should never impede the practical, and so there are limits placed on how far these concepts inform the composition itself.
3. Chapter 2: I. Spectral Music; II. Microtonal Variance; III. Late-Romantic Triadic Transformations

3.1. Chapter 2, I. Spectral Music

3.1.1 The Spectral Aesthetic

While it is difficult to define the Spectral aesthetic as applied to the panoply of composers separated both temporally and geographically over the last 40 years, it can be summarized as an approach that places acoustics, psychoacoustics, and the spectral signatures of instruments before musical systems such as the tonal or 12-tone system. The realm of Spectral music is intrinsically linked to the acoustic properties of the harmonic series and the temporal flux of overtones in an instrumental timbre. Tonal music and Spectral music are both fundamentally based on the hierarchy formed by the harmonic series. In fact, the use of the harmonic series in composition and theory is well documented, from the Pythagorean tuning of antiquity, to the more recent work of Heinrich Schenker who forms his entire conception of the fundamental principles of tonal music as being related to the harmonic series. Thus, the harmonic series is associated as much with traditional common practice era music as with Spectral music, one of the differences being that Spectral music embraces the higher partials (beginning at the 7th partial) which contain microtonal variance from the traditional 12-tone equal tempered system. According to Joshua Fineberg, a leading scholar of spectral music and a gifted spectral composer, “... the most pertinent remark for understanding its [Spectral music’s] meaning was
made by Tristan Murail when he referred to spectral composition as an attitude towards music and composition, rather than a set of techniques.”

Gerard Grisey, who alongside Tristan Murail, was one of the leading exponents of the French Spectral school, outlines some of the consequences of the spectral ‘attitude’, including a “…[m]ore ‘ecological’ approach to timbres, noises and intervals”; “the integration of harmony and timbre within a single entity”; “breaking out from the tempered system”; “a more attentive attitude towards the phenomenology of perception”; “[t]he integration of time as the very object of form”; “[p]ossible dialectics between musics evolving in radically different times”; the “[p]otential for interplay between fusion and continuity, on one side, and diffraction and discontinuity, on the other”; as well as the “…use of supple, neutral sonic archetypes which facilitate the perception and memorization of processes.”

3.1.2 History of Spectral Music

According to Julian Anderson, a noted scholar of Spectral music, while there are many protospectral composers from the early to mid-twentieth century, the most important precursor, or arguably example of, spectral composition is the Danish composer Per Norgard. In particular, Anderson cites Norgard’s 1968 work Voyage Through the Golden Screen as “… an important precursor of spectral


music, perhaps the most direct of all, and must be recognized as such.” Viviana Moscovich cites even earlier forerunners of Spectral composition; in chronological order: Claude Debussy, Edgar Varèse, Giacinto Scelsi, and Olivier Messiaen. She recognizes Debussy for revolutionizing the musical world with two major changes in the linear organization of melody:

1. By thinking of sound as a perceived object, and using it to evoke an image, a colour or a feeling by choosing to mix the sounds into sound-fields of different lengths.
2. In his use of time, focusing on the notion of the instant and on its acoustic qualities.

The next step in the evolution towards Spectral music comes with the music of Varèse for whom “… sound is an essential structural element in music…” and who wanted to “… liberate sound from its scholastic rules.” Varèse invented the technique of ‘ionization’, where different elements of sound are projected into a dynamic acoustic space. Varèse’s seminal work Poème électronique, which was composed for the 1958 Brussels World’s Fair, represents a major shift in compositional direction by breaking the barriers between sounds and noises and traditional music. The distinction between ‘noise’ and ‘music’ opens the door to the Spectral aesthetic, as Spectral composers embrace sounds and noises as the very material with which they structure their compositions. Varèse did not like


11 Ibid, 21-22.

12 Ibid, 22.

the term *musique concrète*, preferring to refer to his music as ‘organized sound.’

As Richard Franko Goldman writes about the work:

… in the electronic medium he is always a composer and not an electrician or finger-painter. One must admire also his discretion in choosing the term ‘organized sound,’ and letting the listener decide for himself whether organized sound is necessarily music. Music is certainly organized sound; it is not yet taken for granted that the proposition works in reverse.14

This emphasis that Varèse was a composer first, and not a technician, is an important distinction. This excursion into the realm of electronic music, of organized sound, influenced composers of the spectral school who were also working in the electronic studios of Cologne and IRCAM. Scelsi represents the next step in the evolution as he “… considered sound as an entity we have to explore and compose with, to feel its pulse at every instance of the piece. He spoke of density, dynamics, spatial position, smooth or rough particles, spectral composition before the appearance of the computer generation.”15 Scelsi’s 1963 work *Chukrum (for String Orchestra)*, is an excellent example of Protospectral composition; the work is centred on an A major sonority which introduces inharmonic tones and noises and explores the interconnection between harmony and timbre. Messiaen, who taught a number of composers including Pierre Boulez, Karlheinz Stockhausen, Tristan Murail, Gérard Grisey, and Michaël Lévinas, takes the next step by using “.. the parameter of Acoustics, [es]specially in what he called: ‘the resonance chord’, as for example in his transcriptions of birds’ songs - each with its exact timbre… [i]n these transcriptions we find one of

15 Moscovich: 22.
the first examples of a fusion between harmony and timbre." Of course, harmony has always been intrinsically related to timbre; each harmony has a timbre, yet traditionally the two were considered separate realms of sound. Messiaen’s musical language fuses these two concepts of sound together, having the timbre inform the harmonies that are utilized. As Robert Sherlaw Johnson writes:

Traditionally, harmony and timbre are quite separate concepts, but the use of added resonance brings the two together in a way which enables harmony to function as timbre. This concept pervades much of Messiaen’s harmonic thought, particularly in his later music. His chords become ‘sound entities’, complete in themselves, and the listener should not be aware of the individual notes which constitute a chord. Messiaen frequently marks the melodic line to be played louder than the associated chords, but merely emphasizes their unified nature and timbre-like quality.

Precursors aside, the emergence of Spectralism is primarily associated with two groups of composers: the Feedback group, centred in Cologne, Germany which is associated primarily with the pupils, associates and assistants of Karlheinz Stockhausen ca. 1970, most notably Johannes Fritsch, Rolf Gelhaar, Clarence Barlow, as well as the Canadian composer Claude Vivier; the second group, centered in Paris, is associated with the Ensemble l’Itinéraire, established in January of 1973 by Michaël Lévinas, Tristan Murail, Hugues Dufourt (who actually coined the monicker “Spectral Composition”), Gérard Grisey and Roger Tessier. In both cases the work of the composers was heavily influenced by their research in the electroacoustic studios at Cologne and IRCAM respectively.

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16 Ibid, 22.

These composers utilized technologies such as Fast Fourier Transforms, Sonograms, and Spectrograms to produce sonographic representations of instrumental and electroacoustic timbres as they evolve over time. This data informed their compositional decisions to varying degrees, but their focus was always the same; to focus on instrumental timbres and harmonic spectra first.\textsuperscript{18} There are some notable Canadian composers of spectral music, including Bruce Mather who experimented with microtonally tuned instruments (although Mather’s use of microtones is not based upon the harmonic series), such as in *Vouvray* (1986) for oboe and harp where the harp is tuned microtonally. Another notable example of spectral music in Canada is found in the music of James Tenney, who wrote many compositions utilizing microtones (often based on the harmonic series) such as *Changes* (1985), which is a composition for six harps tuned a sixth-tone apart. The work of composers such as Philippe Leroux and Paul Steenhuisen represent the continued tradition of Spectral music in Canada.

The influence of the emerging technologies and Spectral analysis led to mathematisable properties of sound for the first time where every sound is composed of different parts, taking into account the harmonicity and amplitude as they change over time. The signal “… is therefore decomposed in [a] series of harmonics and sound is represented in the form of a mathematical formula.”\textsuperscript{19} This total perspective of sound, the nuances of physical phenomena as they evolve over time, became the raw material for the composer.

\textsuperscript{18} Ibid: 15 - 19.
\textsuperscript{19} Ibid: 21.
3.1.3. Spectral Techniques

Instruments are physical bodies, and “…when physical bodies vibrate, they act, to a certain degree as filters, emphasizing certain bands of frequencies and attenuating others.”\textsuperscript{20} These emphasized partials are called formants, and are largely responsible for giving the characteristic sound of an instrument. In the case of the flute the 2nd, 7th, 12th, and 15th partials are all emphasized relative to the other partials, giving the flute its unique spectral signature.\textsuperscript{21} Two other crucial aspects to the sound of an instrument are its attack transients and sound envelopes; these provide a temporal aspect to the sound, i.e. how the sound evolves over time, which also helps us distinguish one instrument from another. For example, the attack in relation to the decay of the piano gives us an auditory impression unique to the piano. To quote Joshua Fineberg, “…[i]t has been shown that if the attack is removed it becomes very hard to identify instrumental timbres correctly.”\textsuperscript{22} The sound envelope may also take a dynamic form, called spectral flux, which refers to the amount of variation within a sound as it evolves over time, and may be modelled using a Dynamic Fast Fourier Transform.\textsuperscript{23}

One of the most common techniques employed by spectral composers is the use of frequency based microtonal structures as opposed to the use of pitch


\textsuperscript{21} Ibid: 92.

\textsuperscript{22} Ibid: 93.

\textsuperscript{23} The Fast Fourier Transform converts time and space to frequencies, and shows how a sound’s formants evolve over time.
classes. These microtones are usually related to the harmonic series, or some
distortion thereof. The series may be stretched, shifted, modulated, or have two
or more fundamentals operating at the same time. While many composers,
including György Ligeti and Iannis Xenakis, have placed a strong emphasis on
timbre, “… the composers of the spectral school have made it the main element
in their compositions …” and “…[t]hey have also established the overtone series
as their point of reference.”24 François Rose notes that the originality of Spectral
music does not come from the fact that it uses the overtone series, citing the
German physicist Hermann Helmholtz as discovering that the ‘colour’ of sound
was influenced by the content and weighting of its overtone structure in 1850.
What is unique about Spectral composition, however, is that rather than focusing
on musical structures that are based upon cells or motifs, which is the dominant
tradition of Western music, Spectral composition responds to complex physical
circumstances (i.e. the raw data produced by sonographic representations of
timbres as they evolve over time) which includes the overtone series.25

At a presentation at the Darmstadt courses in 1978, Grisey outlines the
establishment of timbre over motif:

The material derives from the natural growth of sonority, from the
macrostructure and not the other way round. In other words there is no
basic material (no melodic cell, no complex of notes or note values).26

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*Perspectives of New Music* 34.2 (Summer, 1996): 7.


26 Record notes; Gerard Grisey, *Erato* STU71157, 1981
A powerful example of this new approach can be found in the opening of Grisey’s influential work *Partiels* (1975). The initial inspiration for the composition comes from a sonogram analysis of a low pedal $E_1$ (with a frequency of 41.2 Hz), the formants of this initial spectral signature are orchestrated to the nearest quarter-tone. This technique of orchestrating partials is referred to as “instrumental additive synthesis.”

Not only does Grisey make use of the frequencies of the trombone’s overtone series, but he also respects “… the time-point proportionality between the entrance of the model trombone sonogram’s partials…” taking into account “… the dynamic level of each component.” An example of this would be the way he orchestrates the fourth partial, which is relatively low in amplitude compared to the other partials, as a natural harmonic on the bass, which results in a much weaker sound than the others within the sonority. The way the sound evolves over time is taken into account as “…[i]n most brass sound, the upper partials emerge slightly later than the lower ones, a phenomenon which Grisey imitates (on a greatly expanded time scale).”

In addition to the harmonic spectrum, other components, which are not whole number multiples of the fundamental, may be introduced. The frequencies which remain reflect the phenomenon called inharmonicity. In Grisey’s *Partiels*, partials 1, 2, 6, 10, and 14 are all emphasized with the successive reiterations of the fundamental, but inharmonic tones are gradually added, creating a sense of

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27 Rose: 8.

28 Ibid: 8.

disturbance to the original sound world. As these inharmonic tones become more and more present the music begins to take on a character of noise. This is achieved by “… putting more pressure on the bow while the wind instruments achieve a similar effect by changing dynamics very rapidly while sustaining their sounds.”30 In addition to these inharmonic tones, since the partials are performed by real instruments (as opposed to pure sine tones) with their own complexes of overtones and formants, other sonorities are introduced into the timbre.

Another example of sonographic analysis influencing the composition of a work is Grisey’s Transitoires (1980-81). In this composition, a string bass is analyzed five different ways, playing pizzicato, normal, normal toward the bridge, almost on the bridge, and sul ponticello. With each subsequent entry of the fundamental, partials 1, 2, 3, 11 and 15 are always present, creating a complex sound with its own formants for the entire section. Rose notes that Grisey “… conceived both the entire orchestra and a smaller group of instruments as two synthesized string basses, which we might call a macrophonic and a microphonic one… [he] further contrasted these two synthesized string basses with a real one, always presenting the three in the following order: real, microphonic, macrophonic.”31 The succession of these three sounds creates a sonority which mimics the attack, the amplitude contour, and the decay portion of the sound.

Hasegawa notes that “[f]he physical properties of sound are brought into focus by these techniques of analysis and re-synthesis; this is an appeal to

30 Rose: 11.
31 Ibid: 11.
nature in the objective sense of the term." The reference to the harmonic series in composition and analysis has a long tradition. Beginning with the Pythagorean divisions of the string to create a hierarchical collection of intervals, to Rameau’s corps sonore as formulated in the Génération harmonique, where his principles of harmony are influenced by Castel’s observations of the harmonic series, where “… this phenomenon seem[ed] to offer a more ‘natural’ origin for the harmonic series Rameau had generated through aliquot string divisions, it also provided a more convincing definition of the fundamental bass.” However, Rameau’s treatise on the harmonic series only went up to the sixth partial to avoid the ‘out of tune’ natural seventh partial. Similarly, Schenker’s work “…wants to demonstrate that music as we know it is not a purely artificial construction but grounded in the natural phenomenon of the harmonic series, while at the same time finding a way to avoid the out-of-tune seventh partial.” What is unique about the Spectral approach, however, is that the harmonic series is taken as it is, with all of the ‘imperfections’ of tuning and complex timbral components.

While the relationship of frequencies within a given instrumental spectra (whether it be a single instrument or an entire orchestra) compared to the idealized harmonic series is quite close, most musical sounds have inharmonic spectra. Hasegawa cites the piano string as having “…a stretched spectrum: that is, the first overtone is not exactly twice the frequency of the fundamental (a

32 Hasegawa: 351.


perfect octave), but slightly higher…” and “…[o]nly an idealized string with no
mass or resistance would produce a pure harmonic spectrum.” In fact, by the
fourth octave the partials of a low piano note are actually approximately a third of
a whole tone (+ 65 cents, more then a quarter-tone sharp) higher than their
equivalents in a pure harmonic series. The harmonic spectra of brass
instruments is similar, however their overtone series’ are compressed, i.e. each
partial is lower than its counterpart in the harmonic series.

Whereas the work of the early Spectral composers was influenced by real
sound spectra of instruments and sounds, the work of Georg Friedrich Haas
seeks to replicate the harmonic series in its idealized form. The challenges of
orchestrating a purely harmonic spectrum are difficult to overcome, which is
reflected in the title of his 2010 work Limited Approximations. The work is scored
for a massive orchestra: 4 flutes, oboe, 4 clarinets, bassoon, 6 horns in F, 1 C
trumpet, 4 trombones, 6 pianos, 10 violin I parts, 10 violin II parts, 6 viola parts, 6
violoncello parts, and 8 contrabass parts. The six pianos are tuned to the nearest
twelfth-tone (totalling 72 twelfth-tones per octave). Haas writes about his
intentions in utilizing such precise tunings:

The twelfth-tone tuning of the pianos provides a good approximation of
the intervals of the overtone scale, but diverges from it markedly in some
respects. Ideally, the instruments of the orchestra would take the example
of the tuning of the piano only at the tonic and the octaves, and correct all
other intervals by ear towards the “correct” tuning (particularly the fifths

35 Hasegawa: 352.
and augmented ninths, the major thirds and the minor sixths), with the
twelfth-tone scale of the pianos merely serving as an orientation point.\textsuperscript{37} Haas’ earlier works, most notably his seminal work \textit{In Vain} (2000), contain
microtones which include quarter- and sixth-tones, with many passages utilizing
natural harmonics on the horns and tuning of the harmonic series in the strings
and woodwinds, while the harp is tuned microtonally to the harmonic series of $C_1$.
His 2003 work \textit{Natures mortes} goes a step further, there are six different
overtone chords, of which four are based on the traditional twelve-tone equal
tempered system. \textit{Limited approximations}, thanks to the pianos, allows for a
tuning system that is nearly identical to the natural harmonic series.

3.2. Chapter 2, II. The Harmonic Series and Microtonal Variancem in \textit{Heteroglossia}

\textit{Heteroglossia} makes use of microtones which include quarter-, fifth-, sixth-, eighth-, and even sixteenth-tones; the work of Spectral composers such
Gerard Grisey and Georg Friedrich Haas provides a precedent for such fine
tuning of microtones (Grisey used eighth-tones, and Haas uses twelfth-tones to
tune the just major third). These microtones are utilized in order to approximate
the harmonic series of various fundamentals throughout the composition.
Example 4 shows the harmonic series of the first 32 partials based on the
fundamental of C.

<table>
<thead>
<tr>
<th>Partial</th>
<th>IC</th>
<th>Tone</th>
<th>cent variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>C</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>C#</td>
<td>+5</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>D</td>
<td>+4</td>
</tr>
<tr>
<td>19</td>
<td>3</td>
<td>Eb</td>
<td>-2</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>E</td>
<td>-14</td>
</tr>
<tr>
<td>21</td>
<td>5</td>
<td>F</td>
<td>-29</td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td>Gb</td>
<td>-49</td>
</tr>
<tr>
<td>36</td>
<td>7</td>
<td>G</td>
<td>+2</td>
</tr>
<tr>
<td>25</td>
<td>8</td>
<td>Ab</td>
<td>-27</td>
</tr>
<tr>
<td>13</td>
<td>9</td>
<td>G#</td>
<td>+41</td>
</tr>
<tr>
<td>27</td>
<td>10</td>
<td>A</td>
<td>+6</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>Bb</td>
<td>-31</td>
</tr>
<tr>
<td>29</td>
<td>12</td>
<td>A#</td>
<td>+30</td>
</tr>
<tr>
<td>15</td>
<td>13</td>
<td>Cb</td>
<td>-12</td>
</tr>
<tr>
<td>31</td>
<td>14</td>
<td>B</td>
<td>+45</td>
</tr>
</tbody>
</table>

**Example 4:** the first 32 partials of the C harmonic series.

The first column reveals that partials are related to one another logarithmically, and that new pitch classes\textsuperscript{38} are always formed on odd numbers. For example,

\textsuperscript{38} N.b. These pitch classes are not related to the 12ET system as they involve microtonal tuning.
partials 1, 2, 4, 8, 16, etc… all share the same pitch class, and new pitch classes are formed on the 3rd, 5th, 7th, 9th, 11th, etc… partials. The second and third columns shows the 12-tone Equal Temperament equivalent of each partial. The last column shows the microtonal variance of each partial from the 12ET system where 100 cents is equal to one semitone. Within Heteroglossia, quarter-tones are used to tune partials 11/22, and 31, which have a microtonal variance of -49 and +45 cents respectively; fifth-tones are used to tune partials 13/26, which have a variance of +41 cents; sixth-tones are used for partials 7/14/28 and 29, with a variance of -31 and +30 respectively; eighth-tones are used to tune partials 21, 23, 25, with a variance of -29, +28, and - 27 respectively; and sixteenth tones are used to tune partials 5/10/20 and 15/30, with a variance of -14 and -12 respectively. Example 5 shows how these microtones are notated throughout the composition.
Example 5: Accidentals used in *Heteroglossia* to approximate the harmonic series.

Example 6 shows the opening passage of *Heteroglossia* in the strings. The C₂ fundamental is stated in contrabassi II, and partials 9 (D₅), 10 (E₅), 11 (F♯₅), and 14 (B♭₅) are found in viole (I, II) and violoncelli (I, II). The partials are tuned by virtue of being played as natural harmonics on the C string, with the exception of contrabassi I, which plays the 8th partial (C₄) on the D string as a natural harmonic on the seventh partial, which results a tuning that is a third of a semitone (a sixth-tone) lower than the idealized 8th partial. The string name and partial are given in brackets as a guide to where these natural harmonics are found. Bow directions indicate movement to and from *sul ponticello* (S.P.) - and *extreme sul ponticello* (E.S.P.) to both add colour and to help coax out the natural harmonics.
Example 6: mm. 1 - 7, the opening of *Heteroglossia*.

Example 7 shows the first five measures in the tromboni; each trombone oscillates both up and down by a quarter-tone at various speeds, thus obscuring the fundamental which is heard in the contrabass (at the pitch level of E1). This opening gesture is utilized to create an unsettling atmosphere before the fundamental of C is introduced and harmonized with natural harmonics on the strings.

Example 7: *Heteroglossia*, mm. 1 - 5, quarter-tone oscillations in the trombones.
Example 8 shows a similar passage which can be found in the brass at mm. 28 - 31. The tuba and trombone basso are playing the fundamental (F#1), trombone II is playing the 3rd partial (C#3), and trombone I plays the 4th partial (F#3). At m. 27, the C trombe and corni in F enter with oscillations between different partials using embouchure tuning and natural harmonics: tromba II vacillates between partials 6 (C#4), 8 (F#4), and 10 (A#4); tromba I plays partials 10 (A#4), 12 (C#4), and 14 (E4); corno IV pedals on the 2nd partial (F#2); corno II oscillates between partials 3 (C#3), 4 (F#3), and 5 (A#3); corno III oscillates between partials 6 (C#4) and 7 (E4); and corno I oscillates on partials 9 (G#4), 10 (A#4), and 11 (B#4). The corni and trombe parts are all played by overblowing on the same fingering to coax out the different partials, thus tuning the passage to the F# harmonic series. Not all passages can be performed using natural harmonics to tune the microtonal variance of the partials. Example 9, measures 59 - 65, demonstrates such a passage in the strings. The players tune the microtonal variance of each partial, which is notated in parenthesis above the note.
Example 8: *Heteroglossia*, mm. 28-31, brass harmonics tuning to the F# harmonic series

Example 9: *Heteroglossia*, mm. 59 - 65, microtonal variance in the strings.

Example 10, measures 78 - 83, demonstrates how chords which are based on the harmonic series are notated. Note that the score is a transposing score. The overtone chord is orchestrated in the woodwinds as follows: clarinetto II plays the 12th partial (D₆), the 14th partial is found in flauto II (F₆) with a variance
of -31 cents, the 18th partial is found in oboe (A₆), and the 20th partial is found in flauto I (B6) with a variance of (-14 cents). Most of these partials have a minimal degree of microtonal variance from the 12ET system, but partials 11, 14, and 20 require some degree of variance. I utilized a resource called the Virtual Flute from the University of New South Wales website on music acoustics to find fingerings for the flute to be able to tune these small degrees of microtonal variance, while the quarter-tone in clarinetto I is left up to the performer as it may be tuned using embouchure tuning or alternate fingerings. The exact partials are always notated in this way so that the players and the conductor know where they fit into the chord.

Example 10: Heteroglossia, mm. 78 - 83, how chords based on the overtone series are notated.
3.3. Chapter 2, III. Late-Romantic Triadic Transformations

To contrast the materials that are written using the spectral approach and the harmonic series, a large portion of *Heteroglossia* makes use of late Romantic triadic transformations. These sections utilize a variety of techniques to produce the pitch material, from the use of a twelve-tone row to generate the primary melody, to the use of Richard Cohn’s hexatonic and hyper hexatonic cycles to produce the harmony (example 11). Cohn’s hexatonic cycles, sometimes referred to as ‘maximally smooth cycles’, arrange triads based on parsimonious voice leading. Each triad contains two common tones with its neighbouring triads, and the transformations consist of $P$ (a move to the parallel major or minor), $L$ (an exchange of the leading tone to the tonic), and $R$ (a move to the relative major or minor). The poles within the hexatonic system are maximally dissimilar, i.e. they have no common tones. The hyper hexatonic system takes the four distinct hexatonic collections and arranges them into a North, East, South, and West system. The neighbouring collections have three common tones between the hexatonic cycles, while the hyper hexatonic poles have no common tones.

Example 11: Cohn’s hexatonic and hyper hexatonic systems

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Example 12 shows the construction of a twelve-tone row as it appears in the corno inglese in measures 42-45; this melody contains the seed for much of the sections in the work written in a late-Romantic idiom. The head motive of the row is formed using Set Class 3-2, and this motive is used as the grundgestalt (the basic form) for much of the composition. To quote Schoenberg “…whatever happens in a piece of music is the endless reshaping of the basic shape… There is nothing in a piece of music but what comes from the theme, springs from it and can be traced back to it; to put it still more severely, nothing but the theme itself". The row is almost entirely constructed of partitions of SC 3-2, with the exception of the final three notes, which are constructed of SC 3-3. This twelve-tone row is harmonized using triadic transformations, and recurs at various pitch levels throughout the composition.

Example 12: *Heteroglossia*, mm. 42 - 45 (transposed to C), shows the use of a melodic 12-tone row in the corno inglese

Example 13, mm. 46-49 shows how the head motive of the row is used to generate and develop material. The contrabassi and violoncelli play a i - viio6 - i6 - iv chord progression (although the triads are incomplete), while the violini build

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clusters using natural and artificial harmonics which are based on the
grundgestalt head motive of SC 3-2 using the notes DO, TI, RE. The viole
respond in harmonics with SOL, LE. At m. 48, I briefly quote the principal melody
of Schoenberg’s Verklarte Nacht, which is also constructed with a head motive of
SC 3-2.

Example 13: Heteroglossia, mm. 46-49, shows the grundgestalt motive using SC
3-2
Example 14 shows the woodwinds at mm. 119 - 125, the beginning of
Chapter 4. This very transparent texture has a chord progression which was
derived from hexatonic and hyper hexatonic cycles. The first three chords, f#-,
D6, and d-6 are all adjacent members of the Southern Hexatonic Cycle, i.e. they
are related by parsimonious voice leading to one another. The remainder of the
progression seeks to utilize maximally dissimilar triads. The Eb major chord,
which belongs to the Western hexatonic cycle, is followed by an A6 chord which
belongs to the Eastern hexatonic cycle; this progression is the familiar neopolitan
progression in the key of d minor, but in this context the tonic is obscured
because we begin in the distantly related key of f# minor and end the progression
with an E major chord in first inversion. The sixth chord, g minor, returns to the
Western hexatonic cycle before ending the progression with E in first inversion,
which has no common tones with the g minor chord and belongs to the Northern
hexatonic cycle. Much of the composition utilizes these types of neo-Riemannian
triadic transformations. The music in the late-Romantic portions of the
compositions are very rarely firmly planted in a key, but rather, the music is
allowed to modulate freely to distantly related key areas.
Example 14: *Heteroglossia*, mm. 119-125. Triadic transformations based on the Hexatonic and Hyper Hexatonic systems

The hyper hexatonic system is also utilized at the climax of the work, which is shown in example 15, mm. 207-208. A 12-tone verticality is formed by stacking major and minor triads; in the contrabassi and violoncelli II there is an e minor chord, which belongs to the northern hexatonic cycle. In violoncelli I and the viole there is an Ab major chord, which is at the polar opposite side of the Northern hexatonic cycle relative to the e minor chord. Above this is a Bb minor triad constructed in violins 3 and 4, this belongs to the southern hexatonic cycle, and finally, a D major triad is constructed in violini I and II, which is the polar opposite side of the Southern hexatonic cycle in relation to the Bb minor chord. This chord is scored for the entire orchestra, the only moment of orchestral tutti in the whole piece, but the construction of the chord is most evident in the strings.
Example 15: *Heteroglossia*, mm. 208-209, a twelve-tone verticality created by stacking triads based on the poles of the hexatonic and hyper hexatonic systems.
4. Chapter 3: Concepts in the Writings of Bakhtin

4.1. Chapter 3, I. Dialogism

Bakhtin’s theory maintains that a *dialogic* literary work is in continual dialogue with works of the past; that it is in an involutionary relationship where the present informs the past as much as the past shapes the present. Thus, the dialogic work is inherently influenced by, and maintains an open dialogue with, past and present works. It provides an answer, an affirmation or denial, an extension, or a new context for the previous works. This is not unlike when an author quotes a previous work, removing it from the socio-cultural context of the original narrative, and imbricates it into the context of the author’s own work and society.

Dialogism is best understood as a philosophy of language and thought which stresses the connections between differences. As Michael Holquist eloquently puts it “…[d]ialogism begins by visualizing existence as an event, the event being responsible for (and to) the particular situation existence assumes as it unfolds in the unique (and constantly changing) place I occupy in it.”

Furthermore, Holquist writes that in dialogism life is expression, that expression means to make meaning, and that meaning comes about through the medium of signs. Something exists only as the means in a sign, and there is nothing that may not function as a sign so everything has the potential to mean. Meaning is constructed in both the individual psyche and in the shared social experience.

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through the medium of the sign; it is in both these spheres that understanding comes about as a response to a sign with signs.

Bakhtin’s conception of the novel is that the novel is a specific speech genre whose constituent parts are numerous speech genres. Thus, the novel has the quality of refraction through the use of different languages, none of which are predetermined or which express an objective authorial intent. As Maria Shevtsova writes, these strata of languages “… are brought into being by determinate speakers who seek to address actual, implied, or imaginary interlocutors, among whom must also be counted the sifting thought processes through which one’s own words succeed in finding formulation.”

We can extrapolate from Bakhtin’s writings on dialogism (a term which he himself did not use, although he does write on dialogic relationships) that the stratification of language is used as a device to address certain thematic concerns and varieties of genre. Within individual essays and fiction, we find varying mixes of voices, the dialogism of characters and narrators whose voices are constructed based upon certain socio-ideological conditions, the meeting of which engage in a meta-narrative. At its very core, dialogism is (as the term implies) dialogue, dialogue between the individual and society, between the characters and narrator, and between the author and the reader.

I believe that the history of western art music is intrinsically dialogical. Composers have created entire works on the themes of previous composers.

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They have reused forms such as the sonata or symphony, and frequently employed the compositional techniques and styles of previous composers into their own work. I propose, however, that a dialogic music composition makes free use and even synthesizes disparate, and often polemical, styles, aesthetics, and techniques to create new works. I propose that stylistic extremes are elegantly linked: extreme dissonance and consonance are exquisitely interchanged; old forms and narratives are synthesized to create new forms; and the highly partisan questions of contemporary aesthetics (i.e. does it sound new or conservative) are deemed irrelevant.

4.2 . Chapter 3, II. Polyphony in the novel

In his seminal work *Problems of Dostoevsky’s Poetics*, Bakhtin introduces the concept of *polyphony* (which he borrows from music) to his literary theory. As Andrew Robinson describes:

Bakhtin reads Dostoevsky’s work as containing many different voices, unmerged into a single perspective, and not subordinated to the voice of the author. Each of these voices has its own perspective, its own validity, and its own narrative weight within the novel.45

The voice of the author is not imparted on the characters, thus the novel may have contradictory viewpoints, almost as if the novel was written by the multiple


characters within it instead of a single author. Each character presents her perspective of reality, which may differ from that of the author, and there is “… a plurality of consciousness, each with its own world.” Bakhtin contrasts this style of writing with monologism, a single voice narrative that is characteristic of traditional writing and thought. In a monologistic work, there is one boundless perspective, which is made up of objects with the sole purpose of putting forth a single ideology or certain values. Bakhtin criticizes these works for having a lack of breadth and perspective, since they eschew any contradictory perspective.

Bakhtin explores this concept of polyphony in novelistic discourse. His reading of Dostoevsky “…leaves the impression that one is dealing not with a single author-artist who wrote novels and stories, but with a number of philosophical statements by several author-thinkers - Raskolnikov, Myshkin, Stavrogin, Ivan Karamazov, the Grand Inquisitor, and others.” Dostoevsky’s works are broken up into a series of disparate and often contradictory philosophical stances, each represented by one or another character. Dostoevsky’s own views and philosophical ideals are merged with the voices of these characters, often expressing a synthesis of these disparate philosophical views, and are sometimes even completely masked in prose. The characters’ views are seen to be authoritative and independent; their voices form their own ideological conception separate from Dostoevsky’s artistic and philosophical

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46 Ibid.
47 Bakhtin; 5.
visions. Bakhtin characterizes Dostoevsky’s writings as containing “…[a] plurality of independent and unmerged voices and consciousnesses, a genuine polyphony of fully valid voices…” The characters within the novel are not only objects of authorial discourse, but contain their own discourse populated with their intentions and philosophical perspectives.

My work applies this concept of narrative polyphony via orchestration. I assign individual instruments and groups of instruments certain roles, not unlike characters in a novel. The purpose of this is to take seemingly incompatible musical elements, and to juxtapose and integrate them in equal parts through orchestration. Instead of linking all the instruments together to form one sound, I utilize the inherent strengths of specific instruments and instrumental combinations to portray the three aesthetics I employ - Spectral, late-Romantic, and 12-tone. For example, the brass and strings are excellent for passages containing just intonation, as the natural harmonics on the instruments allow for the complex tuning required to approximate the harmonic series. Woodwinds, with the exception of the flute and clarinet, on the other hand, are much more limited in their capacity to tune to the harmonic series and are utilized for the 12-tone equal temperament passages. The strings and percussion are much more versatile, and are utilized for both the late-romantic material, as well as the spectral material. Throughout the work, the roles of the instruments change to meet the needs of the music, changing between the 12-EQ tuning system to tunings based upon the overtone series.

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The concept of the polyphonic novel has had a significant influence on the artistic design of *Heteroglossia*. Since the conceptual framework of the piece explores a non-programmatic narrative it is structured as a novella for orchestra where multiple strands of musical expression are joined together in equal parts. There is not one boundless, monologic intention to the work; it is by its very nature dialogic in construction. As Bakhtin writes “... *from the point of view of philosophical aesthetics, contrapuntal relationships in music are only a musical variety of the more broadly understood concept of dialogic relationships.*”\(^{49}\) Both musical polyphony and narrative polyphony (i.e. the polyphonic novel) seek to express a dialogue between their constituent parts which differs from the traditional (that is, the homophonic) novel or musical work. It is precisely this dialogue that I explore in my composition.

### 4.3. Chapter 3, III. Heteroglossia

*Heteroglossia* (from the Greek *hetero* - different, and *glôssa* - language), in the writings of Bakhtin, refers to the coexistence of diverse, and often conflicting styles and voices that combine to form the narrative of a novel. It also refers to the refraction of authorial intent into these distinct voices, specifically, by presenting them as “…*another’s speech in another’s language*.”\(^{50}\) Accordingly, a novel assembles these distinct voices and perspectives artistically to form the

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\(^{49}\) Bakhtin, *Problems of Dostoevsky’s Poetics*: 42.

\(^{50}\) Mikhail Bakhtin and Michael Holquist, *The Dialogic Imagination: Four Essays*: 324.
whole. The originality of the novel is derived not from the contrasting elements used to construct the text, but rather from the combination and interaction of its distinct voices. These voices express two purposes: first, to express the intentions of the character; and secondly, to express the refracted intention of the author.

These heterogenous types of discourse are subordinated to the higher stylistic unity of the work, a unity which cannot be identified with any single one of the unities subordinated to it. The novel contains a diversity of social speech types (lexical, semantic, and syntactic) and a diversity of individual voices that are artistically organized. This internal stratification is the indispensable prerequisite for the genre of the novel. Thus the novel orchestrates all of its themes, creating the totality of the world of its objects as well as the ideas depicted and expressed within it, through the social diversity of speech types and by differing individual voices that flourish under such conditions. As Bakhtin writes:

Authorial speech, the speeches of narrators, inserted genres, the speech of characters are merely those fundamental compositional unities with whose help heteroglossia [raznorecie] can enter the novel; each of them permits a multiplicity of social voices and a wide variety of their links and interrelationships (always more or less dialogized). These distinctive links and interrelationships between utterances and languages, this movement of the theme through different languages and speech types, its dispersion into the rivulets and droplets of social heteroglossia, its dialogization - this is the basic distinguishing feature of the stylistics of the novel.51

This point of view is one in which the heteroglot literary language is stratified into generic and period bound dialects; this stratification and heteroglossia is not only

51 Ibid: 263.
a static invariant of linguistics, but it also serves to provide dynamics which deepen as long as language is alive and developing.

While the author writes their text under particular socio-historic conditions, the reader brings their own socio-ideological conception to the text. This relationship expresses the intrinsic heteroglossia of all language and thought, the inescapable relationships that are governed by the past, present, and future conditions surrounding the conception and perception of the work. These heteroglot parameters intersect on a common plane, as all the languages of heteroglossia are specific points of view on the world that are characterized by their own objects, meaning and values. Thus, they may be juxtaposed to one another, mutually supplement one another, and even contradict one another. These inherent relationships struggle and evolve in an environment of social heteroglossia, and the novel seeks to unite these disparate and often polemical understandings; the author, in a sense, orchestrates his themes and values in a referential and expressive manner which methodologically incorporates stratified levels of meaning and understanding.

_Heteroglossia_ (Novella for Orchestra) is, at its very core, intrinsically related to Bakhtin’s concept. My goal, as the composer, was to create a work in which the different styles and aesthetics utilized (spectral, twelve-tone, and late-romantic) refract the musical narrative into different realms of sound. There is no authoritative voice of a narrator or monologic conceptualization to the composition. The language utilized is populated with specific references to the French spectral school (the opening was influenced by the opening of Grisey’s _Partiels_), the music of Arnold Schoenberg (chapter two makes an explicit
reference to the main theme of *Verklärte Nacht*, and late-romantic triadic
transformations (particularly those found in the late music of Richard Strauss,
with emphasis on his 1945 work *Metamorphosen*). Thus, the work is populated
with the use of other’s compositional techniques and aesthetics. It is the
juxtaposition and integration of these disparate styles of composition which result
in a unique work.
5. **Chapter 4: Referential Passages in *Heteroglossia***

Throughout the work there are many referential passages, some explicit, to past works which serve as models. The opening, which begins with the establishment of an $E_1$ fundamental, pays homage to the opening passage of Grisey’s *Partiels* which operates on the same pitch level. Example 16, m. 48, shows a reference to Schoenberg’s *Verklärte Nacht* where the strings play the beginning of the work’s main theme, orchestrated using harmonics in the violini and viole to veil the reference while the contrabassi and violoncelli play identical material to the original (a simple minor ascension from La to Re harmonized with diatonic thirds).

![Example 16](image)

**Example 16:** the left shows m. 29 of Schoenberg’s *Verklärte Nacht* while the right shows how this reference is orchestrated in m. 48 of *Heteroglossia*

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Example 17 shows another explicit reference, this time to Lutosławski’s *Livre Pour Orchestra*. *Livre* opens with a glissando which is orchestrated in such a way that each instrument stops and sustains a quarter-tone on the ascent/descent of the glissando, building a microtonal cluster of quarter tones which spans the intervals of a minor third (descending) and a major third (ascending). This technique is borrowed in mm. 93 - 95 of *Heteroglossia* where a microtonal cluster spans the interval of a major third.

**Example 17:** the left shows mm. 1-2 of Lutosławski’s *Livre Pour Orchestra* while the right shows mm. 93-95 of *Heteroglossia*

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Example 18: the top shows *Spring Rounds* from Stravinsky’s *Rite of Spring*, while the bottom shows mm. 131-135 of *Heteroglossia*.

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Example 18 contains yet another reference, this time to *Spring Rounds* from Stravinsky’s *Rite of Spring*. Mm. 131 - 135 contain a progression of parallel perfect fifths in the same key of E♭ minor to the original, with a melodic line in diatonic thirds in the corni and trombe. The main difference between this passage in *Heteroglossia* and Stravinsky’s *Rite of Spring* is that the original is syncopated, and is much longer than the reference.

Perhaps the most influential reference in the work is to Dr. Peter Paul Koprowski’s *Ancestral Voices* where the strings gradually build a 12-tone verticality. This passage is referenced multiple times in *Heteroglossia*: in mm. 173-177, 205 - 207, and 300 - 303. This technique is utilized many times, most significantly at the climax of the work (mm. 205-207). There are two main differences between the original and the reference: first, the original is rhythmically homogeneous, it is comprised of eighth note triplets (with some sixteenth notes), while the reference (at the climax) builds a five part polyrhythm of gradually faster note values, beginning with eighth notes in contrabassi I and II and violoncelli II, eighth note triplets in violoncelli I and viole II, sixteenth notes in viole I and violini IV, sixteenth note quintuplets in violini III, and sixteenth note sextuplets in violini I and II; the second difference is that the original is voiced as a cluster overtop of an e diminished triad in the contrabassi and violoncello (with a d minor triad in violins I in the top), while the reference is made up of major and minor triads which utilize the poles of the hexatonic and hyper hexatonic systems to complete the aggregate. Example 19 shows the original and the reference side by side with the climax of *Heteroglossia*. 
Example 19: the top shows Koprowski’s *Ancestral Voices* (mm. 311 - 314), while the bottom shows the climax of *Heteroglossia* (mm. 205 - 207)

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The last reference in the work is found in the closing passage of *Heteroglossia*; the reference is to George Crumb’s *Vox Balaenae* which was the first major work to utilize the technique of the *seagull* effect. This effect requires the player to form an artificial octave harmonic and to keep the same shape in the hand while the player performs a glissando down the string; the result of this technique is a series of five descending harmonic glissandi at the same pitch level. While the original utilizes this effect in isolation (i.e. on one instrument), the reference layers this effect in the strings (violini, violes, and violoncelli) to form a complex texture of descending harmonic glissandi. Example 20 shows the original as well as the closing passage where this technique is utilized en masse within the strings.

Example 20: the top shows Crumb’s use of the seagull effect in *Vox Balaenae*\(^{56}\), while the bottom shows this technique layered in the strings in mm. 341 - 349 of *Heteroglossia*

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The utilization of these drastically different references demonstrates the use of heteroglossia in the work. There are many different languages being utilized: the Grisey reference reflects a Spectral aesthetic/language; the Schoenberg reference reflects a late-Romantic aesthetic; the Lutosławski reference demonstrates microtonal clusters; the Stravinsky reference in turn reflects a neo-Classical language; the Koprowski reference exhibits a 12-tone aesthetic; and the Crumb reference makes use of extended techniques. Thus, \textit{Heteroglossia} references many distinct musical language types, the intersection of which form the narrative of the work. These different realms of sound contribute to the overall dramatic arc of the piece, juxtaposing different tuning systems, aesthetics, and techniques. Just as in Bakhtin’s writings, where we find contradictory philosophical statements belonging to the various characters in the novel and a variety of speech types reflecting social heteroglossia, there is an essential dialogue between the different languages utilized in the composition. I have explored these various languages in previous works, always monologic in orientation, but with \textit{Heteroglossia} the opportunity presented itself to see how these different realms of sound interact dialogically. The goal was not to seek out commonalities between these languages, but to embrace their differences and to see how they interact. The resulting work aspires to narrate the evolution of my compositional style.
6. Chapter 5: I. Narratology and Semiotics; II. Conclusion

6.1. Chapter 5, I. Narratology and Semiotics

The branch of musical analysis concerned with narratology “...might be summarized as the effort to integrate structural and semantic-expressive aspects of musical works in the act of analysis by developing concepts capable of functioning simultaneously in both domains.”\(^{57}\) The concept of a ‘musical plot’ need not be restricted to programmatic interpretations of narrative. While *Heteroglossia* explores the concept of narrative it is essential that this narrative be understood as non-programmatic; i.e. it is best thought of as the integration of formal and semantic content of the work, from individual motives to the entire piece, where the music’s internal relations do not reference some specific extramusical source. Put more explicitly, the internal dramatic arc of the music is sufficient to construct the narrative. Gregory Karl provides a definition of musical plot as works in which:

(1) ... some of its elements can be understood to represent quasi-sentient agents and their actions, and (2) that the totality of such actions forms a complete and coherent unity coextensive with and inclusive of the entire musical unfolding.\(^{58}\)

Central to this concept is the fundamental relation between human experience and musical plots in which the motives and themes behave as characters without the mediation of a narrator. Musical agency and the internal relations of a work can be compared to a stage drama in which individual actions are perceived in the present tense. This comparison allows for an interconnection between the structure of a work and its plot.

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\(^{58}\) Ibid, 16.
Perhaps one of the more influential thinkers in the field of semiotics is Jean Molino. Molino’s work on semiology is “...grounded in a critique of the time-honoured dichotomy of the objective (‘analytic’) and the subjective (the aesthetic or interpretive).”\(^{59}\) His work centres around the need to develop a general framework of thought that can integrate the fragmentation of music in practice, in theory, and under analysis. There is a strong influence of structuralism and generative linguistics on the application of new principles to traditional analytical problems, in particular, the analysis of the aesthetic domain which necessitates the development of new strategies.

While the study of sound is a matter of physics, the choice of sounds that are produced is a matter of aesthetics. Western art music has been primarily concerned with the process of rationalization and specialization, and we have adopted the theories of Pythagoras and Rameau as a means of understanding both acoustic properties and the principles that guide the interaction of the acoustic phenomena. Molino cites Descartes’ *Compendium Musicae* as the “...break between the science of acoustics and music” in which Descartes stands by the traditional definition as “*[t]he object of music is sound. Its purpose is to please and to arouse in us various passions.*”\(^{60}\)

With this broad definition of music, there remains the problem of establishing a correspondence between the physical properties of sound, its pitch, rhythm, and timbral components to the passions of the heart. While

\(^{59}\) Ibid, 17.

traditional analytical methods seek to categorize music through abstract theoretical, proportional, and objective means, there is need to establish theorems which contribute to the realm of the mental state. While the analysis of music can be dismantled into figures and musical facts, a codification of intervals and rhythms, this does not explain all the variables of music production. An account of music’s semiology provides us with another facet or level of understanding of the work.

Music often operates in the realm of the symbolic; it may signify concrete associations with real world phenomena in which it is concomitant to some extramusical association or exegesis, or express more abstract expressive qualities. Monelle notes that scientific and empirical knowledge signify symbolic phenomena, in which an understanding involves a description of the systems in which they are embodied. These systems signify a certain syntax and mode of expression, closely integrated into the realm of esthesic. An analytical approach offers both a technical study between the esthesic (what is heard) and the aesthesic (why it is beautiful). Since composition is flexible, music analysis must be as well.

A primary question which concerns musicology is ‘what is music’? The answer to this question is rather ambiguous; the Western art music tradition codifies music in the canon, while many cultures rely on improvisation or even on musical games, such as Inuit throat singing. When considering the poetic, esthesic, and aesthetic domains one can come to the conclusion that “…music is

whatever (composers or listeners) choose to recognize as such, and noise is whatever is recognized as disturbing, unpleasant, or both. The border between music and noise is always culturally defined." This definition frees the musicologist to explore anything that seems musical. An entirely emic approach is not always possible, so the musicologist must refer to their own conceptual framework as a starting point in understanding musics of all cultures. In this vein, Nattiez addresses the problem of finding musical universals to understand what exactly defines music; however, “…any characterization of something as ‘universal’ [depends] heavily on which of the object’s traits are selected in a given analysis.” Musicological discourse and the musical object it studies are both symbolic facts which can be interpreted according to semiological principles. In analyzing the music of different cultures, even if the musical surface appears the same, the cultural context of the music producers may have widely different perceptions of how the music is created, thus “…universals can no longer be sought at the level of immanent structures, but in more profound realities.”

These ‘profound’ realities must take into account the process of production, as well as the poetic, esthesic, and aesthetic perceptions of both the producer and the listener.

In the search for universals there are certain musical facts which we come to accept; facts such as the relationship of the octave, the contours of a melodic line, and perhaps most importantly, the harmonic series. All of these facts are

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63 Ibid, 63.

64 Ibid, 65.
grounded in both physical phenomena as well as in perception and cognition of
music. When it comes to the latter, Molino and Nattiez identify three levels: 1. the
poetic level, which deals with aspects of the production of a piece of music. This
factors in everything from the creative process to the act of notation or
memorization (with regards to oral traditions and improvised musics) in reference
to the cultural milieu that influences the composer/musician; 2. the esthetic level,
which concerns the ‘receiving’ end or consumption of music and deals with
issues of music perception, interpretation, reception history, and cognition; and 3.
the neutral level, which concerns the music itself, with the immanent
configurations of the trace, i.e. the end result of the poetic process (the score
and/or sound object). Nattiez states that “…the task of semiology is to identify
interpretants according to the three poles of the tripartition, and to establish their
relationship to one another.” The delineation of these three levels is of particular
importance to the analytical domains; it provides a means of avoiding
unnecessary confusion when one makes inappropriate claims for one level of
analysis based on the analysis of another level.

The trace that arises from the neutral level provides us with a means of
establishing aspects of the poetic level, as well as providing ways of
understanding the cognition, perception, and interpretation of music concerning
the aesthetic level. For this reason, the neutral level is the centrepiece of the
whole semiotic process. In order to avoid inappropriate claims for one level of

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65 Joshua Veltman. Review of: Jean-Jacques Nattiez, Music and Discourse: Toward a

66 Nattiez: 29.
analysis based upon another level, these three domains must be carefully delineated. For example, one may undertake a structuralist analysis at the neutral level, but one must be careful when applying claims to the poetic and aesthetic levels based upon this analysis unless one has explicitly moved into these domains. This three tiered analytical structure, referred to as the tripartition, appears to suggest a relationship to communication theory where there seems to be a relationship from producer to message to receiver. However, Nattiez claims that “… semiology is not the science of communication.”

It is far too simplistic to suggest the idea that the producer ‘encodes’ a message at the neutral level for the receiver, who ‘decodes’ this message and interprets some semantic meaning where there may not be one as such. The listener is not a passive participant in the process, as they construct musical meaning for him- or herself based upon their own musical experience and level of understanding. Their observations may provide fruitful interpretations of the work, but this has no bearing on the poetic level or intentions of the composer/producer. Traditional musical analysis tends to operate in the realm of the neutral level, however, semiotics allows for “… an ecumenical mindset in which every analysis has some validity within a certain pole of the tripartition…” A given analysis can never account for all the possible variables within the tripartition; the realm of the poetic and aesthetic allows us to understand humanistic aspects which are not formalized, aspects which deal with impressionistic analyses,

67 Veltman: 3.

68 Nattiez: x,15,16.

69 Veltman: 6.
paraphrases, and hermeneutic readings of a work. A structuralist analysis, on the other hand, provides formalized analyses which are based upon models that are constructed from observations of a given canon of music that yield certain models and compositional rules.

While the work may be devoid of any associative extramusical meaning, this does not preclude semantic relations in the interpretation of a work. Raymond Monelle notes that “… [t]he science of semantics has travelled far beyond the bounds of attributed meaning.” Semiotics is more broadly concerned with explaining meaning in regards to relational phenomenon where “… music is a cultural or social phenomenon, definable only in terms of its value held in a culture according to a quantitative, qualitative, and analytical interplay.” Within this framework, meaning in music is ascribed informally, with loosely defined terms and methods. There are no abstract analytical procedures, but there is a schematic theory of music as communication which takes into account musical poetics and aesthetics. There are numerous agents of interpretation and “… the perceptual strategy intensifies the degree of mediation between the signifier and the signified on a neutral level.” This study of meaning encompasses all musical, theoretical, musicological, analytical, interpretative, historical, and aesthetic components.

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70 Monelle: 73.


72 Jean Molino, J.A. Underwood and Craig Ayrey: 106.
Robert Hatten, a notable scholar in music semiotics, notes that “...[t]he neutral level is a theoretical fantasy”\(^7^3\) because the analyst is unavoidably influenced by their own awareness of the poetic and aesthetic levels, despite any attempts at rigour and formalism. Furthermore, he notes that the neutral level may exist, but that the analyst, as a non-neutral observer of the piece is influenced by their own biases regarding the realms of the poetic and aesthetic. Hatten proposes a different way of thinking of the neutral level, stating “...[s]ince the neutral level of analyses can proceed from the hypotheses, and presumably those hypotheses are developed with attention to their potential [poetic] or [a]esthetic relevance, perhaps a better term for Nattiez’s neutral level would be ‘hypothetical level.”\(^7^4\) This poignant criticism of Nattiez’s theory has some merit, as there “...does seem to be a contradiction, or at least a tension that needs to be addressed, between Nattiez’s recourse to immanent analysis and his statement that there can be no purely etic analysis.”\(^7^5\) Regardless of this criticism, Nattiez’s theories provide a means of examining music at multiple levels, and “...[b]ecause it is a program for analysis, semiology takes up [various musicological] questions, and attempts to answer them with control and [rigour] - but not, of course, definitively.”\(^7^6\) Nattiez clearly delineates the limitations and benefits of semiological analysis when he writes:

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\(^7^4\) Ibid: 94.

\(^7^5\) Veltman: 11.

\(^7^6\) Nattiez: 178.
All analysis with a semiological orientation should, then, at least include: (a) a comparative critique of already-written analysis, when they exist, so as to explain why the work has taken on this or that *image* constructed by this or that writer: all analysis is a representation, (b) an explanation of the analytical criteria used in the new analysis, so that any critique of this new analysis could be situated in relation to that analysis’s own *objectives* and *methods*.... Making one’s procedures explicit would help to create a *cumulative progress in knowledge*, and consequently the emergence of an analytical discourse that would be more satisfying, because it is more controlled.⁷⁷

At the poetic level, *Heteroglossia (Novella for Orchestra)* explores a musical narrative which juxtaposes spectral, 12-tone, and late-romantic aesthetics. The intention of the composition is to integrate these seemingly disparate musical aesthetics into a unified whole. Each chapter of the work expresses, in turn, a refracted musical narrative based on either spectral, 12-tone, or late-romantic aesthetics. The musical plot is non-programmatic, i.e. there is no extramusical meaning ascribed to the composition, this does not, however, preclude a poetic meaning for the work. The work expresses its semiosis through the lens of absolute music, and the listener is invited to interpret the music with their own processes of signification and semiosis.

My piece is constructed as absolute music, but this does not preclude a semantic or semiotic meaning to the work. My own interpretation of the work's semiosis is that it is grounded in a dialogue of similarities and differences between the disparate sections with which it was constructed. I don’t ascribe meaning to the individual motives and gestures found the piece, but rather to the overall structure and affect of the work. What I seek to express is a tension

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⁷⁷ Ibid: 177.
between the languages, aesthetics, techniques, and tuning systems utilized, a
tension that has no resolution.

Steven Paul Scher outlines methodological guidelines for study of the
intersection of music and literature which include: (1) *Metaphoricity*, which
accepts and embraces the attempts to apply terms from one art to objects in
another as being inherently metaphorical in status; (2) *Cognitive Dissonance*,
which promotes ‘surprise’ and ‘cognitive dissonance,’ over ‘appropriateness’ or
‘adequacy’ as the primary criteria of value when studying analogies of the written
word and music; (3) *Deep Structures*, which emphasize the search for underlying
principles between the arts, not the description of direct one to one
correspondences; (4) *De-essentializing the Arts*, which refers to the ability of the
analogous art forms to both reconfigure and deepen our understanding of the
arts and their various roles while resisting the temptation to force them to fit
established definitions (regardless of how widely they are accepted); and (5)
*Focus on Significance and Implications*, which outlines how analysis should
always be guided by broader cultural questions of meaning and value, i.e. why
do the analogies of music to literature and literature to music matter.\(^78\)

Cupers notes further that music and literature are “[c]osmologically
connected [as] they have also been inextricably mixed up throughout their
history,” and that the “…degrees of metaphoricity may vary widely but for
practical purposes the very processes of reading a text and reading a score can

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be shown to be quasi-identical.”79 In a similar vein, Hayden White expands upon this idea when he writes in *Music and Text* of the effort to explicate a relationship of similarity and difference between musical and literary expressions, suggesting that we live in a cultural time when literature is “…striving towards the condition of music” while at the same time music has been “…striving for the condition of language” which allows us to consider afresh “the musical aspect of verbal expression, on the one hand, and of the extent to which a semantic content, similar to that figured forth in literary expression, might be said to inhere in musical form, on the other.”80

*Heteroglossia* explores this connection between literary text and musical forms of expression. It’s genesis was conceived as a narrative in which the component parts that form the whole can be viewed as characters, each of which expresses my refracted intentions. The semiotic meaning is not intended to represent concrete, extramusical associations, but rather invites the listener to interpret the works semiosis in their own way. The use of vastly different techniques and aesthetics elicits varying emotional responses to the material presented, and it is my hope that the listener can engage the various strata of the work on their own terms.

79 Cupers: 315.

6.2. Chapter 5 II: Conclusion

There are many influences which inspired the genesis of *Heteroglossia*. From the use of the Fibonacci series and the Golden Proportion to structure the work, the use of microtonal variance based upon the harmonic series, the use of neo-Riemannian triadic transformations, the reference to Bakhtin’s theories on narrative, the introduction of semiotic content and narratological theories of music, and to the dialogic references to past works. The work can be understood only as the intersection of all of these influences, creating multiple strata for the interpretation of the work.

*Heteroglossia* is unique in relation to the traditional, monologistic works which represent the canon of Western Art Music. Although the work can be viewed as a nascent epitome of polystylism in the tradition of Alfred Schnittke or Valentin Silvestrov, it is the conception of the work as a narrative that sets it apart from these models. The influence of Bakhtin’s theories on literature as applied to music layout the conceptual foundations of the composition, forming a unique intersection of different languages and aesthetics. Thus, the work is an exemplar of dialogism, with its facets of narrative polyphony and heteroglossia, of semiology and narratology, of the borrowing of other’s language and aesthetics to create the whole. My intentions as the composer are refracted through the influence of all these categories and signifiers; the work is an unique utterance of conceptual foundations which are alien to one another yet bound within the whole. This composition represents my first steps in the synthesis of a new musical utterance, of an internal dialogism which reflects the structure of the work, of its conceptualization, refraction, and juxtaposition of many distinct voices.
and languages, paving the way for future compositions which will continue to develop these internal ideologies. The listeners are, of course, invited to interpret the composition in their own way; it is unlikely that their perception of the work will parallel my conception of it, but it is my hope that I offer in this paper a glimpse into the inner workings and conceptualization of the composition. As Bakhtin writes in his conclusion to *Discourse in the Novel* “… great novelistic images continue to grow and develop even after the moment of their creation; they are capable of being creatively transformed in different eras, far distant from the day and hour of their original birth.”81 Thus, I welcome the perceptions of others to account for the composition’s inner workings, and by no means do I perceive this account of the composition as authoritative.

81 Mikhail Bakhtin and Michael Holquist: 422.
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Appendix

Performance Notes (for Parts)

Glissandi are to be performed for the entire duration of the note.

\[ \text{= Gradually Shift From One Mode of Playing to Another} \]

Strings

S.T.  Sul Tasto

S.P.  Sul Ponticello

E.S.P.  Estremamente Sul Ponticello: as Close to the Bridge as Possible

N.  Normal; Return to Normal Bowing.

(String Name/Partial)  When natural harmonics are utilized, the string name and partial are provided. Ex. (C/11) indicates the 11th partial on the C String. When natural harmonics are utilized, the string name and partial are provided. Ex. (C/11) indicates the 11th partial on the C String

Woodwinds

Flute Fingering Guide
Heteroglossia makes use of microtones to tune the partials of the harmonic series of various fundamentals. The following chart illustrates the accidentals used throughout the composition to approximate the partials: A semitone equals 100 cents, a 1/4 tone equals 50 cents, a 1/5 tones equal 40 cents, etc... When these microtones are used, the performer can adjust their tuning to approximate the partials of the harmonic series, this is achieved through alternate fingerings, embouchure tuning, playing partials as harmonics, and tuning the partials on the strings.

<table>
<thead>
<tr>
<th>Tone Type</th>
<th>Variance</th>
<th>Sharp Accidental</th>
<th>Flat Accidental</th>
<th>Accidental if note is already sharp</th>
<th>Accidental if note is already flat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 tone</td>
<td>ca. 100 cents</td>
<td>#</td>
<td>b</td>
<td>×</td>
<td>bb</td>
</tr>
<tr>
<td>1/4 Tone</td>
<td>ca. 50 cents</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
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<tr>
<td>1/5th Tone</td>
<td>ca. 40 cents</td>
<td>↓</td>
<td>↓</td>
<td>#</td>
<td>#</td>
</tr>
<tr>
<td>1/6th Tone</td>
<td>ca. 33.3 cents</td>
<td>↑</td>
<td>↓</td>
<td>♩</td>
<td>♩</td>
</tr>
<tr>
<td>1/8th Tone</td>
<td>ca. 25 cents</td>
<td>↗</td>
<td>↘</td>
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<td>+ b, d, ↑, etc...</td>
</tr>
<tr>
<td>1/16th Tone</td>
<td>ca. 12.5 cents</td>
<td>↖</td>
<td>↙</td>
<td>+, #, ↑, ↓, etc...</td>
<td>+ b, d, ↑, etc...</td>
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