Magnifying lenses: How the spectral analysis of the voice – human and animal – can be used to strengthen the connection between text and music

PORTFOLIO OF COMPOSITIONS AND TECHNICAL COMMENTARY

Thesis submitted for the degree of Doctor of Philosophy

Silvia Rosani

Goldsmiths, University of London

January 2016

I hereby declare that the present work and the work in the accompanying portfolio are my own except as otherwise specified.

Signed,

Silvia Rosani

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to all those who have guided me so far through the path which led me to acquire the musical knowledge and experience I have today, because everything they have infused into me informs my research and has prepared the base on which I keep on building. In particular, I am referring to Renato Miani, Reinhard Febel, Achim Bornhöft, and especially to my supervisors Roger Redgate and Patricia Alessandrini, who supported me and supervised this work.

A special thanks to the Goldsmiths Library, without which I could not have managed to get my hands on some rare scores, and paying my fees and rent would have been far more difficult.

I am also very grateful to the Akademie Schloss Solitude, which enabled me to spend a wonderful time immersed among other artists, to the Sir Richard Stapley Educational Trust and to the Francis Chagrin Award, which supported the creation of my cycle for cello.

I feel extremely privileged to have always been able to listen to my music performed by incredible performers, which taught me a lot. I would like to thank all of them for their patience and dedication: El Perro Andaluz Ensemble, Ourania Menelaou, Alexey Kokhanov, the Neue Vocalsolisten, Kinga Tóth, Trio Vis-à-vis and Esther Saladin.

Surely a big thank-you goes to my parents and sister, who understood my choice not to be an electronic engineer and supported my path as a composer, and who, whenever at a contemporary music concert, still send me the programme note and their precious comments, striving to understand and even appreciate this contradictory field.

My gratitude should go to my dearest friends, whom I can barely distinguish from my family, and who understand my disappearances before a deadline.

To my partner goes my warmest gratitude for supporting my moving from one country to another, and for finding every time a satisfactory way to join me and my music again.

ABSTRACT

This commentary describes how my compositions in the last four years have been based upon models of human and animal vocal utterances, including both textual and paralinguistic elements, and how they strengthen the connection between text and music especially via synthetic relationships, based on the reproduction of the microscopic sound features of the voices which utter text. The textual elements are projected into the speech domain, thus acquiring uniqueness and including in the composition the *aura* of the being whose voice is analysed and later re-synthesised by the instruments involved. Varied repetition is used to feature text at multiple levels of enlargement, or filtering stages. All these occurrences of the same textual material have been regarded as nodes of a *rhizome*, since I conceived them as windows on to plateaux with different temporal scales or filtering processes, all intersecting a clearly defined socio-political plateau. The *window* form proved very useful for the inclusion of improvisation-based blocks and for the incorporation of elements from previously existing compositions into new ones. The Deleuzian concept of the rhizome created a suitable frame for the main aspects of my research and, since the change of analytical methodology in the course of the portfolio reflects my growing interest in perception, it is my intention to proceed along the path shown by Deleuze and Bergson to investigate the concepts of repetition and memory. Within the portfolio, the socio-political layer is at first determined by the content of the text, but later also by the identity of the person uttering the text and the techniques (s)he uses, so that in one of my compositions I successfully embedded music belonging to a non-Western culture. These trends show a future path for my research – namely, the identification of social differences among individuals and the detection of the traces of trauma through the analysis of their voices.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ADDITIONAL MATERIALS

Portfolio of music scores:

Omertà II

Il Reuccio fatto a mano

Narciso

T-O

Die Elbe

White Mask

Cera

Disc1 - Pure Data patches, recordings and technical requirements (more details in Appendix 5).

Disc2 - Videos (more details in Appendix 5).

PORTFOLIO OF COMPOSITIONS AND PERFORMANCES

1. ***Omertà II*** for ensemble (2012 - 9'30")

El Perro Andaluz ensemble, April 2012, Mozarteum Universität (Salzburg)

2. Il Reuccio fatto a mano for piano (2012 - 8')

Ourania Menelaou

October 2012, Mozarteum Universität (Salzburg)

January 2013, Goldsmiths, University of London

3. ***Narciso*** for baritone (2013 - 6')

Alexey Kokhanov, March 2013, Flanders Operastudio (Gent)

4. ***T-O*** for five voices (2013 - 11')

Neue Vocalsolisten:

February 2014, ECLAT Festival (Stuttgart)

April 2014, MATA Festival (NY)

July 2014, Biennale Venice (Venice)

May 2014, Teatro de la Zarzuela (Madrid)

August 2015, Centro Kursaal (San Sebastian)

May 2016, Onassis Cultural Centre Athen (Athens)

5. ***Die Elbe*** for flute, voice and cello (2014 - 5'30")

Trio Vis-à-Vis:

Dec 2014, HKI (Stuttgart)

May 2015, Südseite Nachts Festival (Stuttgart)

6. ***Controller*** for voice and live electronics (2014 – ca.14'30")

Kinga Tóth and Silvia Rosani, December 2014, HKI (Stuttgart)

7. ***White Mask*** for cello (2015 3'30" - 6')

Collaboration with Frankfurt-based cellist Esther Saladin

8. ***Cera*** for cello and live electronics (2015 - 3'30"-10')

Collaboration with Frankfurt-based cellist Esther Saladin

ca. 65'

1. INTRODUCTION

The works presented here draw upon the knowledge of the structure of sound and the tools for sound analysis with which composers have been progressively provided since the 1950s. Collaborations between composers and technicians, along with technological development in the field of computer music and with the consequent success of CAC as an independent discipline, have led to a natural leaning towards the reproduction, via instrumental additive synthesis,[1] of the microscopic and most intimate parts of the surrounding sound universe (Wishart, 1996; Daubresse, 2000; Fineberg, 2000; Murail, 2005; Agon, 2006). The *objets sonores*[2] and the models shaped on them have become the fundamentals of that branch of contemporary music to which my work belongs, which encompasses the analytical tendency of spectral music (Daubresse, 2000),[3] and their transformations and transitions between one object and the other have given rise to new formal structures (Tenney, 1988; Hirs, 2009; Moscovich, 1997).[4] All the compositions in my portfolio are based upon models of human and animal vocal utterances, which include text or paralinguistic elements, and strive to strengthen the relationship between text and music not only through mimetic means but also via the synthetic relationship,[5] based on the reproduction of the microscopic sound features of the voices which utter text, hence projecting it into the domain of speech and, therefore, bestowing uniqueness.[6]

Given the nature of the models I choose, my works can be related to those of Gérard Grisey, James Tenney, and some of the composers who employ the analysis and synthesis tools developed at IRCAM (Rose, 1996; Wannamaker, 2008).[7] Among those

1 An idea arising from the concept of additive synthesis developed in early spectral music, instrumental synthesis aims at shaping complex sounds by combining simple sounds, each of which is played by a different instrument. Since instruments have their own complex spectrum, the resulting sound is no longer similar to the model employed (Fineberg, 2000).

2 Sonorous objects (the term derives from Schaeffer, 2004).

3 Spectral music, according to François Rose, rejects 'the motif as the principal constituent element of a composition' and establishes 'timbre instead', while being 'original for its choice of models' and 'its attitude towards time' (Rose, 1998: 8).

4 According to Tenney, primary musical ideas gradually changed into complex sound-configurations in most of the music of the 20th-century. This entailed the necessity to develop new rules that were able to shape musical structures, and composers had to delve deep into the realm of perception.

5 According to Peter F. Stacey, text and music are in a synthetic relationship when they are 'so closely knit that a synthesis of the media is created' (Stacey, 1989: 29).

6 In *Speech and Phenomena*, Derrida rejects the distinction between temporal and non-temporal discourse (Derrida, 1973). I embrace this point of view to bind text and speech together.

7 Institute for Research and Coordination for Acoustics/Music, based in Paris and founded by Pierre Boulez.

composers Tristan Murail may be enumerated, since he employed data retrieved by the analysis of Mongolian diphonic singing in *L'Esprit des dunes* (1994) (Hirs, 2009). Nevertheless, it is especially important to mention Gérard Grisey's contribution, because his starting point for *Les Chants de l'amour* (1982-84) was a collection of texts. The vowels of the sentence 'I love you', the names of famous lovers, the inscription 'Chants de l'amour pour tout', fragments from Julio Cortázar's novel *Rayuela* and litanies on the word 'love' in different languages are all integrated into the work, so that it becomes a metaphor for affective relationships, which the listener recognises in the struggle between synthetic and real voice, synthetic and real choir (Bossis, 2004).

The acousmatic nature of the *objets sonores* I employ, which are reproduced by a source different from the one that originally created them, generates an *aura*, in the sense proper to Giacinto Scelsi and Helmut Lachenmann (Freeman and Scelsi, 1991;[8] Hockings, 1995),[9] which can be perceived as an instrument of inclusion of a social reality – of a presence/absence, according to Walter Benjamin (Haselböck, 2009).[10] In my portfolio, the sonorous object occurs several times within a composition, every time slightly varied as if observed from different points of view, and its frequent appearances lead the listener to group its repetitions and sometimes even to recognise the nature of the voice which produced the sonorous object from which a model has been derived.[11] These repetitions – *perforations* of the music plateaus through which one can glimpse the textual plateaus – can be regarded as nodes, points of contact between the different plateaus of which a *rhizome* is made up.[12] Salvatore Sciarrino shapes some of his compositions using a similar approach, choosing as rhizomatic nodes the tones of an old

8 It is Robin Freeman who supposes Scelsi would have used the term *aura* to refer to the ornamental efflorescence, used by the composer to decorate the notes which in his music functioned as polarities. The word is, therefore, connected to features which are strictly musical. Nevertheless, if one thinks of these characteristics as belonging to a model, it is apparent that this concept of aura is not far from the one Lachenmann associates with each instrument, identifying with it a specific timbre and a well-determined instrumental tradition.

9 Helmut Lachenmann defines *aura* as 'Reich der Assoziationen, der Erinnerungen, der archetypischen, magischen Vorausbestimmungen' (Lachenmann, 2004: 88). Besides connecting the concept of *aura* to the realm of associations, he also highlights the interchangeability between the words *aura* and *tradition*. This entails a connection to Walter Benjamin's concept of *aura*. Both of them in fact refer to the idea of distance. This distance is physical for Benjamin, as becomes clear when reading his example of the mountain (Benjamin, 2008), yet temporal for Lachenmann, who projects instrumental tradition into history. In both cases, *aura* is a form of absence.

10 Brian Ferneyhough himself associates the concept of *aura* with the idea of presence (Gee, 2013).

11 According to Tenney, the factors of proximity and similarity, demonstrated by Wertheimer for visual elements, apply to musical elements as well (Tenney, 1998). Moreover, it happened once that, after a concert in Stuttgart, a member of the audience – who did not know about my compositional technique – enthusiastically reported to me that she had had the impression of hearing some sort of crickets call in *T-O*, my composition for voices. One of the tracks I had analysed for that piece included cicada calls, not crickets, but I was favourably surprised that she had managed to perceive the call.

12 Rhizome is regarded as a multiplicity (Deleuze, 1987: 8).

song,[13] opening and closing time windows on parallel and different temporal horizons (Haselböck, 2009; Sciarrino, 1998; Angius, 2007). The deconstruction of tonality occurs also in Lachenmann's music, when, in *Accanto* (1975/76), Mozart's A major clarinet concerto K622 emerges only temporarily, through a temporal window, from a recording that is being played as a background to the performance of Lachenmann's own music (Heathcote, 2003; Mohammad, 2004; Lachenmann, 2004).[14] The varied repetitions of sonorous objects which occur within some of Brian Ferneyhough's works can be regarded as horizontal explorations of them (if different time scales in the form of rhythmic filters are used, as for example in his Fourth String Quartet), or as vertical explorations (if pitch filterings are employed, as in the cycle *Carceri d'invenzione*) (Ferneyhough, 1995; Fitch, 2009; Malt, 2008; Haselböck, 2009). A *maquette*[15] seems to be the perfect tool to formally organise the varied repetitions of the models based on frog and loon calls in Tristan Murail's *Le Lac* (2001) (Hirs, 2009). Finally, it is well known how Grisey employs the 'superposition of forms flowing within radically different time frames' in *L'Icône paradoxale* (1994) (Baillet, 2000; Grisey, 2000: 3).

The synthetic relationships built between text and music in my portfolio rely on technological development, which influences the origin of musical material and affects its formal organisation with the ability to pierce the temporal continuum (Paddison, 2010; Sciarrino, 1998), thus enhancing the influence that the non-musical world exerts on music. Therefore, my approach to connect text and music differs from the techniques which are still among the most commonly used by composers, such as musical mimesis[16] and timbral association,[17] which, although associated with contemporary

13 Sciarrino himself describes *Vanitas* (1981) as a huge anamorphosis of the song 'Stardust', composed by Hoagy Carmichael in 1929 on a text by Mitchell Parish (Angius, 2007).

14 The title stems from the simultaneity of the two actions. 'Accanto' in Italian means 'beside'. Some elements of the concerto survive in Lachenmann's score, and function as points of contact with the recording in the background.

15 'A maquette is an original interface designed for the purpose of uniting the program and the score. This is a two-dimensional space in which graphic boxes (temporal boxes) may be laid out and organised' (Bresson, 2008: 310).

16 This is a tool which is still very common among, but not exclusively, French and Italian composers. Stacey (1989) describes several kinds of mimetic relationships employed by Pierre Boulez in *Pli selon Pli* to connect his music to Mallarmé's text, and also illustrates mimetic relationships between Berio's music in *Laborintus II* and Dante Alighieri's text. Olivier Messiaen, too, used mimesis to depict the content of the sacred texts which he often included in his compositions, and he went as far as to develop a language that he called *langage communicable* and employed in *Méditation I* to deliver the content of the text to the audience (Shenton, 2008). Mimesis is a tool that Luigi Nono employed often to interweave text and music in his works. An example can be found in Diario Italiano, in which the direction of the phonemes on the page seem to follow the wave from the Vajont Dam, that in 1963 swept Longarone town in Italy (Ramazzotti, 2007).

17 Sciarrino (1998) highlights how, in *Salut für Caudwell* (1977), Lachenmann grounds the relationship between the temporal space of the voice and that of noise in an empirical association of timbres, based on auditive resemblance with no theoretical consistency. In *Récitations* (1978), Georges Aperghis

musical languages and formal organisations, are not very far from the techniques used in sixteenth-century madrigals (Hiekel, 2013).

A quotation from Giorgio Agamben's *The Open* offers, I hope, a precise synthesis of what has been described so far and connects the fundamental elements in my research and compositional praxis. '*Homo*', when staring at his distorted image in an optical machine made up of a series of mirrors, 'must recognize himself in a non-human in order to be human' (Agamben, 2004: 27). This entails a relationship between man and animal,[18] a series of transfigured representations of a well-determined reality, the verification of the existence *of the other*. The multiplicity of distorting mirrors represents my use of varied repetition as a way to transfigure the original sonorous object through different time scales or filtering. This optical machine connects animal and man, whose voices are analysed and later re-synthesised to create a connection between text and music and evoke a presence/absence, the *aura* of the other, who struggles for inclusion.

The commentary is structured so that each chapter describes one or two compositions from my portfolio, which are presented in chronological order. Besides highlighting each work's relationship to text through the elements described so far, the connection each composition of the portfolio has with the techniques used by the composers listed above will be illustrated. The Conclusion will clarify and stress the development of the main elements of my research through my portfolio, and briefly touch on some directions for my future research.

employs a phonetic organisation so that French syllables and phonemes are combined to form a language which sounds like French but is not French (Gee, 2013). With the intention of pursuing the rhythmic aperiodicity of improvised chanting in crowds, Nicolaus Huber shapes speech-like gestures in *Vor und Zurück* (1981) (Huber, 2008).

18 Agamben underlines the difference between human and non-human animals, where the latter is a human being excluded from a community. This defines *the other,* who is not part of a well-determined community, because of his/her religion, ethnicity, origin, sexual orientation or other features (Agamben, 2004).

2. *OMERTÀ II*

for ensemble (2011/12)

In 2010, I wrote and performed a composition for voice and live electronics, *Omertà*,[19] the title being a word used in Italian if the witness to a crime refuses to testify. A second version, *Omertà II* for ensemble (2011/12), was later developed, using information retrieved by the analysis of the voice recorded in a performance of the previous piece. In the first part of the present chapter, I will describe how I interpolated a window form (Sciarrino, 1998) with a canon structure to connect the semantic content of the text to the formal structure, and how I divided the ensemble into three groups in order to preserve the antiphonal relationship the *concertino* has with the *tutti* in a *concerto grosso*, as well as a spatialisation of the sound similar to that in the voice-and-electronics version of my piece. The re-orchestration of *Omertà* was born from Helmut Lachenmann's words 'Komponieren heißt: ein Instrument bauen'[20] (Lachenmann, 2004: 77) and from my fascination for *Speakings* (2010), a composition for large orchestra and live electronics by Jonathan Harvey (Nouno et al., 2009).

2.1 Window form and spatialisation

Two aspects of the formal organisation of *Omertà* are maintained in the version for ensemble: the canon form, and the fact that each of the three parts in which the composition is articulated has a connection with a specific syllable of the title. The original idea was to represent a reformed mafioso's effort to collaborate with justice via the alternation of singing with open and closed mouth, followed by a collective reaction to his/her braveness, which in the first piece is realised by the live electronics. In *Omertà II*, the nine instruments of the ensemble were divided into three groups of three instruments each, and the one with flute, accordion and violin plays the role that the *concertino* has in a concerto grosso, hence developing a dialoguing form with the *tutti*. After an introduction based on this antiphonal relationship, a canon starts between the *concertino* and group 2 (clarinet, percussion and double bass), sometimes disrupted by the insertions of the 'windows' in which group 3 (piano, viola and cello) appears. The introduction depicts a life spent within a criminal organisation. The first group, the one

19 Homage to Roberto Saviano, Italian writer and journalist, who became a symbol of the fight against the Camorra after his book *Gomorra* was published.

20 'Composing means building an instrument.' My translation.

starting the canon, represents a reformed mafioso and has the same function the singer had in the former version of the piece. The second group, which joins the canon later, represents another mafioso, who regrets what he did in the past and who follows the example of the first one.

The *windows* which perforate the structure of the canon have been added to insert memories of the past into the present. These bars are strictly connected to the ones in the introduction, and they have been conceived in the same way as the recorded piano material in the version for voice and live electronics, thus as symbolising the Camorra.[21] This builds a metaphor of memory and, in this particular case, could represent the testimony of a reformed mafioso in a trial (remembering the life depicted in the introduction). These windows are very easily recognisable because they employ the same crotchet time unit as the bars in the introduction. Nevertheless, there are other similarities too between the windows and the introduction – sometimes based on the choices of intervals, other times on similar rhythmic features. One of the most apparent is that each of the windows includes demisemiquavers and glissandos, which are features that can be found over the whole introduction.

<table>
<tr><td colspan="8">1st phrase
bb. 1-4
1st phrase
bb. 10-16
1st phrase
bb. 23-27</td><td colspan="8">2nd phrase
bb. 5-9
2nd phrase
bb. 17-22
2nd phrase
bb. 28-33</td><td>Section
1
2
3</td><td rowspan="4">First section
(concerto grosso)</td></tr>
<tr><td colspan="3">1st part</td><td colspan="3">2nd part</td><td colspan="3">3rd part</td><td>1st phrase
(Gr 1)</td></tr>
<tr><td>bb. 34-48</td><td>b. 49</td><td colspan="2">bb. 50-67</td><td>b.68</td><td>bb. 69-83</td><td>b. 84</td></tr>
<tr><td colspan="4">1st part</td><td colspan="4">2nd part</td><td rowspan="3">1st phrase
(Gr 2)
2nd phrase
(Gr 1)</td><td rowspan="3">Second section
(canon + windows)</td></tr>
<tr><td colspan="3">bb. 85-99</td><td>b. 100</td><td>bb. 101-117</td><td>b. 118</td><td>b. 119</td><td>b. 120</td></tr>
<tr><td colspan="8">3rd part</td></tr>
<tr><td>bb. 121-123</td><td>b. 124</td><td>bb. 126-128</td><td>bb. 129-130</td><td>bb. 131-134</td><td>bb. 135-136</td><td>bb. 137-140</td><td>bb. 141-143</td><td></td></tr>
</table>

Table 2.1 – Formal structure

21 The Camorra is a mafia organisation which was born in one of the regions in southern Italy.

From the table below it can be seen that when group 2 plays the first phrase of the canon, group 1 plays the second one, exactly as happens in a traditional canon.

In the first version of the composition, spatialisation was realised by four loudspeakers. The voice of the singer came from the two speakers above the stage or from all four speakers, according to the function of the sound at that particular instant in the piece. Therefore, it was possible to clearly distinguish the physical source of each voice, which shaped the canon. *Omertà II* does not employ electronics and the spatialisation of sounds relies on the subdivision of the ensemble into groups. The instruments are therefore not placed where they usually are, but are rather located on the stage according to their relationship with one of the three groups.

2.2 Three methods for pitch retrieval and organisation in *Omertà II*

By the word 're-orchestration', I do not mean that the sung melody of *Omertà* has been harmonised in a more or less traditional way and that each instrument has been assigned a pitch, according to a previously settled harmonic plan. The connection between the pitch universes of the two pieces was realised via the analysis of the singer's voice, recorded during one of the performances, and instrumental additive synthesis. This methodology was used by James Tenney when he analysed the song 'No More Good Water', sung by Jaybird Coleman, and subsequently used the information obtained to synthesise his ensemble composition *Three Indigenous Songs* (Wannamaker, 2008). In *Omertà II*, the three syllables *om-*, *-er-* and *-tà*, isolated from the word in the title, were similarly analysed. The second syllable occurs in both the first and second phrase of the canon and the results of the analysis were distinguished as illustrated in Fig. 2.1. Differences due to singing techniques were taken into account; this explains why in Fig. 2.1 the vowel 'a' has two different results, the first one corresponding to ordinary emission, the second one to half-air emission. Regarding the syllable *-tà*, five frames were analysed, so that four different chords were retrieved to describe the transient between the letters 't' and 'a', which I subsequently named T_1-T_4 and A_1/A_2. AudioSculpt was employed to identify the fundamental frequencies in the selected fragments,[22] after the sonogram[23] had been simplified by deleting partials below a

22 AudioSculpt – a registered trademark of IRCAM – is software for the viewing, analysis and processing of sound.

23 A sonogram may be defined as a visual representation of the spectral contents of a sound (IRCAM,

certain threshold. The overtones of these frequencies were subsequently extracted and can be found in Fig. 2.1. These eleven chords were employed as pitch material to build the bars in the *windows*, according to the scheme shown in Table 2.2. In those bars, piano, viola and cello rebuild the 'voice' instrumentally by synthesising some of the original features of the singing. Therefore, they open a window on a particular instant of *Omertà*, but on a plateau on which the former composition has been stretched so much that its microscopic features have a considerably longer duration.

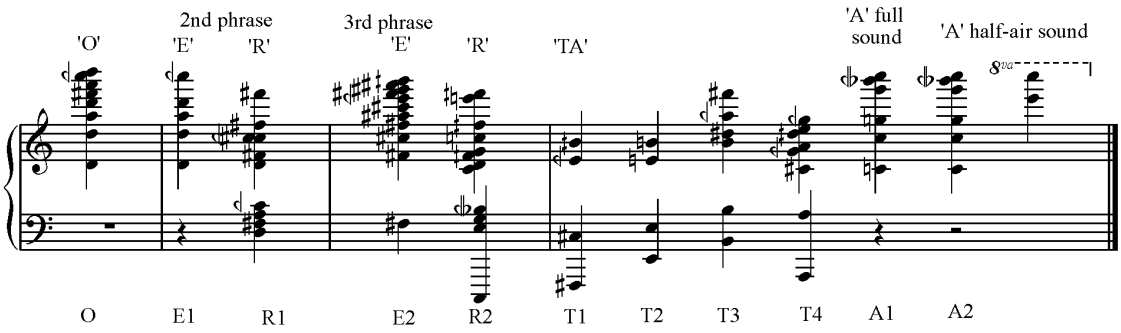

Fig. 2.1 – Fundamental frequencies extracted by the analyses of the syllables and their overtones

	1st phrase			**2nd phrase**						
	1st part	**2nd part**	**3rd part**	**1st part**	**2nd part**		**3rd part**			
Bars	49	68	84	100	118	120	124	129-130	135-136	141-143
Windows	1	2	3	4	5	6	7	8	9	10
Chords	T3+T4 +A1	T3+T4+ A1+(E1)	T3+T4 +A1	T1+T4 +(E2)	T1+T2 +T3	T4+(E1)	T1+T3	T2+T4 +(E1)	T3+T4	T1 +(A1)

Table 2.2 – Chord organisation within the windows

The material in the *windows* appears slightly modified every time it occurs, because its range goes progressively from high to low, so that between the highest pitch in bar 49 and the lowest one in bar 143 there is a difference of more than five octaves.

2015).

Moreover, in all the windows it is possible to identify three kinds of material: demisemiquavers, glissandos, and percussive elements. Each instrument in group 3 plays in turn its own version of at least two of these material types. From bar 124, however, the strings start to organise their material around the interventions of the piano, thus ending the piece with a process of progressive fragmentation. A second criterion was used to choose the pitch content of the windows, so that there are common tones with the neighbouring bars. In bar 48, F#6 and E7 are played by the accordion and the violin and later resonate in the window at bar 49, while B4 played by the cello and B6 played by the piano and viola echo in the following bar in the B4 assigned to the alto flute. Vocal techniques were transferred to the second piece not only through the pitches retrieved from the analysis, but also directly to the instruments of the ensemble. The struggle between 'talking and not talking', which is reflected in the alternation between singing with open and closed mouth or between full sounds and air-sounds, is translated according to the technical features of instruments. Woodwinds are able to realise smooth transitions between air and full sounds very comfortably (Levine and Mitropoulos-Bott, 2002),[24] while accordions produce air sounds by moving the bellow without pushing any button (Buchmann, 2010).[25] String players can mirror the vocal filtering created by formants by changing the pressure of the left hand between harmonic pressure, half-pressure and ordinary pressure or the position of the bow between *sul ponte* and *tasto*.

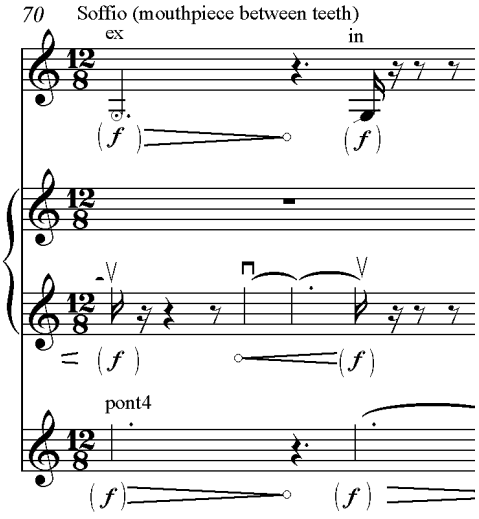

Fig. 2.2 – Bar 70: air-sounds and bowing sul ponte

24 Nevertheless, a distinction has to be made within the woodwind family, and it is one that particularly affects those woodwinds included in the orchestration of my piece. When a flute plays an air-sound, it is always possible to identify a pitch, while for a clarinet this is not the case.

25 Two kinds of air-sounds were employed for the accordion. One is produced when pushing the bellow, and the other, which can be louder, by pulling it.

The one in Fig. 2.2 is an example in which air-sounds have been employed.

The pitch organisation in the canon is much simpler than that in the windows. The whole first part (bb. 34-48) is built on the chord corresponding to the letter 'o' and other harmonics of D, because in the former version of the piece the first phrase of the canon was characterised by the syllable *om-*. Where foreign pitches occur, they are conceived as nonharmonic tones.[26] The violin, accordion and flute summed together, generate a line which in the first version of the piece was sung, hence synthesising the instrumental 'voice'. The focus of the second part of the first phrase of the canon (bb. 50-68), although still definitely centred on D, tends to shift towards A. Memories are very strong and vivid in the reformed mafioso's mind, so that when, after the second window at bar 68, the third part of the first phrase of the canon starts, it is just a breath. This third part is mainly built on the triad F#-A#-C#, although some harmonics of D are still present. In the second and last phrase of the canon (bb. 85-143), group 1 plays what in the first version of the piece was built on the syllable *-er-*, i.e. using the pitches in chords E1 and R1. Since group 2 plays its version of the first phrase of the canon, it is easily deducible that this section too is divided into three parts. The overlapping between the two groups generates harmonic ambiguity and tension, since there is the co-presence of pitches belonging to D major and D minor, such as F# and A# (enharmonically Bb).

The features of some bars in Corelli's Concerto Grosso, Op. 6 No. 8 deeply influenced the formal structure of the piece. In Fig. 2.3, one can observe how the solo violins develop a counterpoint based on two melodic lines which are strictly connected in a play of echoes. If we permute a few pitches in the second violin's line, we obtain the first violin's line. The result is a continuous echo effect, in which the *tutti* also participates. Moreover, there is a temporary unison once per bar between the two solo violins and once every two bars between the solo violins and the *tutti*. Each echo, therefore, is varied by the dynamic presence or absence of the other instruments, by the irregular permutations of the segments of the melody and by a constantly varying continuum, realised by the *concertino* cello.

26 Nonharmonic tones are defined as 'melodic tones which are not members of the chord against which they are sounded' (Piston, 1978: 109). Since each chord is a group of harmonics on a fundamental tone, I use this term to identify tones which are not among the first sixteen harmonics of a fundamental tone.

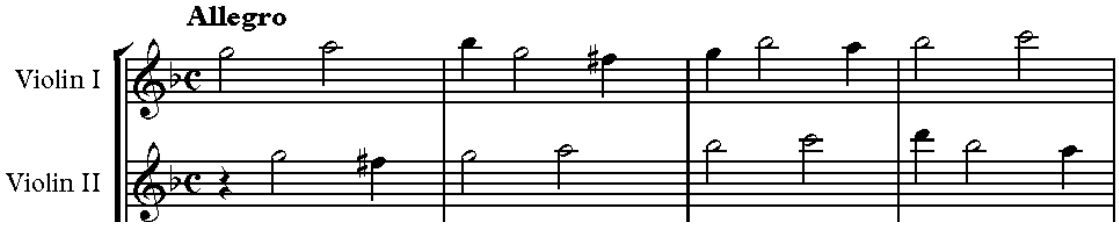

Fig. 2.3 – First four bars (concertino, violins I and II) in the Allegro *of the Concerto Grosso Op. 6 No. 8 by Arcangelo Corelli*

All those features observed in Corelli's score contributed to the shaping of a sonic and structural idea for the introduction to my canon. One pitch, which I call the central tone (CT), was assigned to each bar, so that the temporary unison which occurs in each of Corelli's bars is augmented in the first section of my piece to the full length of a measure. I decided to determine groupings of notes very close to the so-called CT in order to build what Giacinto Scelsi would have called an *aura*,[27] while other instruments play the CT in unison or an octave higher or lower. In Fig. 2.4, the piccolo plays an efflorescence around the CT F#7, while the accordion irregularly alternates F#6 and C7. At the beginning of the bar, moreover, the attack of the sound is reinforced at the lower octave by an F#6 bowed on a crotale. The violin plays the pitches of a D major chord as a complement to the harmonic plan in Table 2.3. It is easy to observe a connection between bar 3 and 49 by comparing the piano's and viola's materials in the two bars. Nevertheless, one more similarity can be highlighted, since the concept of *aura* in Scelsi's terms is realised in bar 49 as well as in bar 3. In bar 49 too, in fact, a CT can be identified – here C natural – while the other pitches are either harmonic or nonharmonic tones. Since bar 49 is a 'window', however, the concept of *aura* here also entails the recollection of a specific timbre, that of the voice of the singer who performed *Omertà*.[28]

27 See note 8 in the previous chapter.
28 Or the voice of the reformed mafioso, if one wishes to push this reasoning even further.

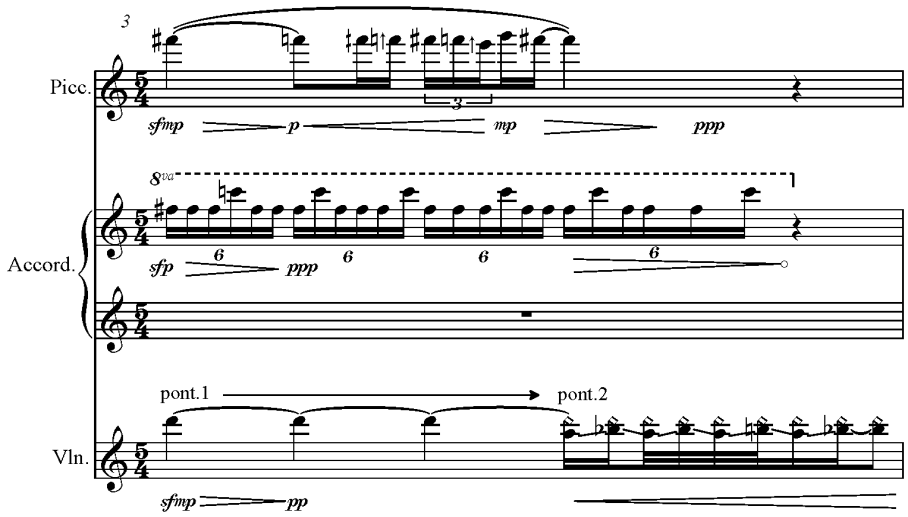

Fig. 2.4 – Piccolo, accordion and violin lines in bar 3

A scheme of the formal structure of the introduction and of the CTs in each bar is illustrated in the following table:

														Tonal centre (degree referred to D major)
	1st phrase							**2nd phrase**						
Bar	1		2		3		4	5	6	7	8		9	I
CT	D		C#		F#		A	D	G#	A	D		D	
	3rd phrase								**4th phrase**					
Bar	10	11	12	13	14	15	16	17	18	19	20	21	22	VI
CT	F#	C#	C#	C	B	F#	F#	D#	G#	D#	G	F#	B	
	5th phrase							**6th phrase**						
Bar	23		24	25		26	27	28	29	30	31	32	33	V of V → V
CT	E		F#	E		A	E	C	B	E+F#	E+A	A	A	

Table 2.3 – Correspondence between the CTs and the bars in the introduction

Moreover, a chord to which the CT belongs has been associated with each bar, so that each pair of phrases is organised around a specific tonality with a strict relationship to D major. Nevertheless, these tonalities are not explicitly stated. Firstly, the only elements of the chords which are played are those belonging to the harmonic structure of the chords' fundamental pitches. For instance, in bar 13 the CT is C, and the chord used is A

minor with the addition of its ninth harmonic, B. Secondly, sometimes in a bar almost exclusively the CT and its *aura* are played. All these pitches gravitating around the CT are conceived as nonharmonic tones. Finally, overlapping between different chords can also occur. One group of instruments plays the tone – or a line centred on it or on one of the harmonics of the fundamental pitch of the chord to which the CT belongs – and another group answers with lines which follow the same rules, thus generating a formal structure which magnifies the echo effect among instruments characterising Corelli's composition. Owing to the non-homogeneous orchestration,[29] the crosstalk between instrumental groups in this piece offers a great variety of timbral situations centred on a given pitch at any particular moment.

29 Corelli wrote this concerto for strings and basso continuo, which was usually realised by a keyboard instrument like a harpsichord. This means that only one instrument did not belong to the string family.

3. IL REUCCIO FATTO A MANO

for piano solo (2012)

In the present chapter, I will illustrate how I encoded the letters of a nursery rhyme with musical figures using a technique similar to Olivier Messiaen's *langage communicable* (Shenton, 1988), which he employed in his *Méditation sur le Mystère de la Sainte Trinité* (1969).[30] From the description of the methodology used, it will be clear how the pitch content of the musical figures corresponds to that of the text when read aloud by myself. The technique of instrumental additive synthesis and other features included in the piece will also be connected to some of the characteristics of Friedrich Cerha's *Für Marino* (2010). Moreover, I will underline the correspondence between the verses of the text and the phrasal structure of the piece, and how some musical sections are conceived around letters, words or phrases (the choice of which depends on the 'scale of enlargement' of the text currently in operation). Finally, I will also point out how I linked my composition to the tradition of *cunto*,[31] and hence mimicked the temporal scales of the oral tradition of storytelling.

In October 2010, I listened to the pianist Marino Formenti performing the premiere of a piece dedicated to him by Friedrich Cerha, *Für Marino (Gestörte Meditation)* (2010) (Cerha, 2011). Although I only saw the score of this piece after my own composition for piano was finished, it is possible to identify several similarities between the two pieces. First, both works feature an alternation of recurring tempos,[32] and a specific kind of material is associated with the appearance of each. Second, due to this formal choice, some elements are repeated very often,[33] and there is very little development in terms of rhythm. Finally, both Cerha and I employ pedals to implement an additive synthesis of sounds.[34]

30 Unlike Messiaen, who actually believed it possible for the audience to decode this *langage* and consequently understand the concealed text, my purposes were to facilitate the learning of the nursery rhyme for the pianist and ease the process of memorising the piece for a performance.

31 *Cunto* is the Sicilian tradition of aural transmission of stories, thus storytelling. Miming is fundamental and the person who tells the story uses every part of the body (Burgatella, 1989).

32 Crotchet = 84, 63, and 42 in my composition, crotchet = 36 and 138 in Cerha's.

33 In Cerha's piece the bichord D-C# occurs 17 times overall, thus at bars 10, 13, 15, 17, 33, 46, 49, 50, 56, 71, 76, 106, 127, 129, 138, 159 and 160.

34 Cerha makes connections of material between sections in different tempos, so that, for example, what was melodic in one section becomes harmonic in the other. This is, however, just an artifice, because the use of the pedal in the slowest tempo allows the pianist to build complex sounds by progressive addition.

3.1 Formal structure and connection to an Italian fairy-tale and the Sicilian tradition of *cunto*

'Il Reuccio fatto a mano',[35] one of Italo Calvino's 'Italian fairy-tales' (Calvino, 1993), includes the nursery rhyme on whose text my composition is based. When I read this short story, I could not help thinking of puppet-politicians, whose power is only nominal and whose decisions are made by others behind the scenes. Moreover, the idea of a 'hand-made king' reminded me of a puppet performance by Mimmo Cuticchio[36] which I attended at the 2008 Salzburg Festival, and which included the *cunto*. Therefore I decided to combine both the nursery rhyme and the power, typical of *cunto,* to open a temporal window on the listener's perception of time.

As specified in the Introduction, my work often includes varied repetitions of the same element, which occurs as if observed through lenses with different focuses. Consequently, like Grisey's *Les Chants de l'amour* – in which the sentence 'I love you' sustains the whole structure of the work but also occurs in the tape part (Bossis, 2004) – *Il Reuccio fatto a mano* embraces different levels of enlargement of the same material and is organised in four sections (see Table 3.1), each one corresponding to one or more levels of magnification of the text.

Text	Bars	Section
Letters	1-7	1
Re Pipi fatto a mano	7-18	2
Sei mesi a setacciarti	19-29	3
Sei mesi ad impastarti	30-45	
Sei mesi per spastarti	46-58	
Sei mesi per rifarti	59-74	
Whole text, except the last verse	75-80 (*cunto*)	
sei mesi alla nicchiola e ti viene la parola	81-94	4

Table 3.1 – Correspondence between musical phrases and text

The first part corresponds to the biggest *enlargement* and constitutes an introduction to the composition, since it illustrates twelve motivic figures, each

35 See full text and translation in Appendix 1.
36 Sicilian artist, who inherited his father's tradition of *cunto* and *Opera dei Pupi*.

corresponding to a letter of the first line of the nursery rhyme plus *z*.[37] For example, the motif positioned in bar 1 corresponds to the letter *r*, while the one in bar 2 stands for *e*, so that we have the word *re*, thus 'king'. Between the figures corresponding to letters that have the same nature, similarities can be observed. For example, 's' and 'z' are both fricative consonants and the corresponding motifs were built with similar elements – such as a first low sound in the left hand, followed by muted sounds which resonate thanks to keys played *staccato* by the right hand. These motifs can be observed respectively on the third and on the fifth and sixth beats in bar 6.

In the second section of the piece the focus moves from letters to words and the system of figures exposed in the introduction is employed to encode the first sentence of the nursery rhyme. Some of the motifs have expanded in terms of duration, and their elements tend to be transferred to other letter-figures. For example, in bar 7 the letter *r* no longer lasts for three beats but four, and the letter *e* expanded as well from the original two to three beats. The rest of the bar appears as a resonance and a contraction of what happened before, so that the double tremolo ends in a high trill on the ninth and tenth beats. In this section motifs tend to expand, because of the proximity of similar elements or because the text itself implies repetitions. In bar 8, for instance, the motifs corresponding to the word *pipi* use the repetition of the syllable *pi* to develop new connections between them and to move towards a higher range. In bar 9, the presence of two *t*'s in the word *fatto* helps to disperse the tension that the element in the previous beat of the bar has developed.

The third part of the composition contains the four central verses of the nursery rhymes, thus the ones framed between the words *sei mesi* and the syllable *-rti*. To each of the verses corresponds a musical phrase organised as shown in Table 3.1. The section ends with an additional phrase, which is characterised by the syncopated rhythm of *cunto*, and reduces once more the enlargement by focusing no longer on words or letters but on sentences. In this section the merging of the motifs, in terms of both pitch and rhythm, develops even further. For example, in bar 47 it is possible to notice how the addition of a sustained sound to the motif corresponding to the letter *s* develops a connection to the previous beats of the bar, thus to the musical figure of the letter *e*. Repetitions of the groups of three demisemiquavers show their nature as fragments of a tremolo and, hence, raise the awareness of the proximity of the two letter-figures, since

37 The motif corresponding to this letter was written when it was still not clear which text would be used to build the piece. When I decided to use only the nursery rhyme, the motif had already become part of the composition and I chose not to remove it.

the letter *e* includes a tremolo. This illustrates another aspect of this section, which is the development of melodies and counterpoint between voices. In bars 19 and 20, a first attempt at building a melodic fragment is the presence of A4 and C2 in the left hand, followed, in bar 22, by another melodic fragment in the left hand, E0-D3. In bars 30-31, the left hand draws quite a long melodic line, E1-F#2-E2-D#4 and C3, whose peak in terms of duration is placed in bars 60-61. Here, the melody develops a counterpoint with the line in the right hand.

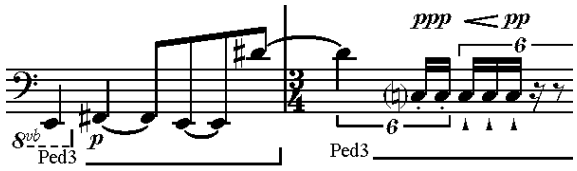

Fig. 3.1 – Bars 30-31, melodic fragment in the left hand

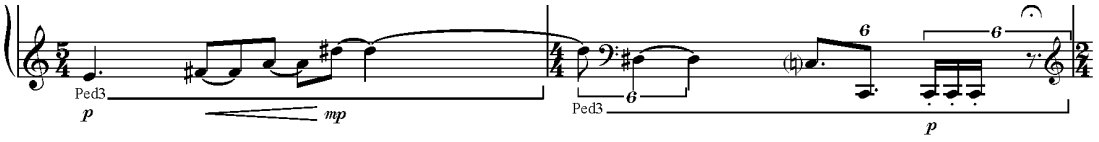

Fig. 3.2 – Bars 60-61, melodic fragment in the left hand

Besides developing the merging process of the letter-figures, this procedure also contributes to the transition towards the area of the *cunto*, in which the double-dotted note preceded or followed by a demisemiquaver is a fundamental element. This feature spreads to almost all the rhythmic elements in the piece, irrational rhythms included. Each chord in this area no longer corresponds to a single letter but to a syllable, so that it is possible to underline the dynamically unstable and 'wrong' accentuation of the words.[38] This section brings to an end the process of compression among elements corresponding to different letters in terms of pitch. Moreover, by suddenly starting in a relatively low range, while the previous section was organised in a relatively high area, and by moving quite quickly again towards a high range, the phrase results in a sort of summary of the irregularly ascending trend in the third section of the piece. This links the phrase to the tradition of *cunto* even further. When the storyteller reaches the core of

38 The strong accents in the music are positioned so that they do not correspond to those of the words. This is exactly what happens with *cunto*, when a duel or a battle starts, and time seems to slow down, so that the scene can be depicted in detail. The effect for the listener is that of a time stretch.

the story, which is usually a scene characterised by a lot of action such as a duel or a battle, he stomps the ground with one foot, while rotating a sword in the air. This action is mirrored in the piece by the low *staccatissimo* chords in ***mf*** that can be observed in bars 79 and 80, and by a rapid movement from low to high.

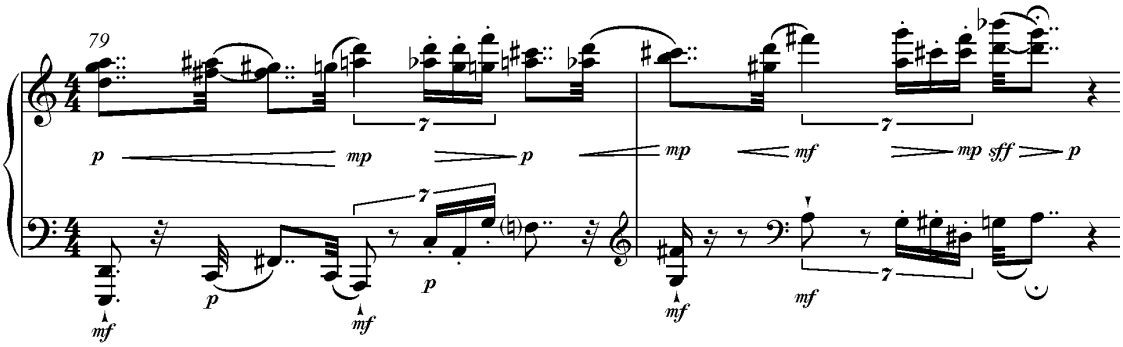

Fig. 3.3 – Bars 79-80, low staccatissimo *chords in the left hand and general ascent from low to high*

The fourth section of the piece corresponds to the last verse of the nursery rhyme. The focus goes back to words, but, although the letter-figures appear even more fragmented than in the introduction, this does not affect the degree of merging between motifs. In the last two bars, each chord corresponds again to a syllable, and the syncopated element of the demisemiquaver followed by a double-dotted quaver is a dim echo of the storyteller's stomps.

3.2 Analysis of spoken text for the creation of musical figures to encode alphabet letters

The idea of retrieving data to be embedded in the compositional process from the analysis of a text read aloud by the composer has been used by several artists in the past. In 1964, François-Bernard Mâche recorded a poem by Clément Marot and analysed the sonogram of the recording to write *Le son d'un voix* (Bossis, 2004). Gérard Grisey used information related to the recording of his voice uttering the words 'Piero della Francesca' to compose *L'Icône paradoxale* (Baillet, 2000). James Tenney recorded himself reading a poem by Walt Whitman to collect data for his *Three Indigenous Songs*

(Wannamaker, 2008). Since I had decided to associate a musical figure with each of the letters in the chosen text, I identified a method to generate a connection between each letter and a group of pitches to be used in these figures. For this purpose, I analysed the recording of my voice reading the text of the nursery-rhyme, used AudioSculpt software to determine the fundamental pitches, and manually deduced their loudest overtones.

Letters	Fundamental pitches	Letters	Fundamental pitches
A	A1, D2, G2	S	G#2, G2, F#2, D#3, E1
L	G1, A2#, D3	M	A1, F3
F	C#1, E3	P	A2, A#1, C0
T	A0, D#2	I	A4, C2, C5, D#3
N	G#3, A2	R	Bb1, G#3, G4, E4, F3
'cc'=K	D0, A#1, G2	E	E1, F#2
O	A1, F1, G1	Z	G#0, F2, F3, A#2

Table 3.2 – Correspondence between each letter and its fundamental pitches

When a musical figure is associated with a letter, it includes only pitches that belong to the group of fundamentals found in the analysis, or of their overtones. In a subsequent phase, the overtones found were grouped according to their range and to the kind of musical figure they belong to. Thanks to this categorisation, it was easy, via a process of filtering, to structure a progressive movement towards a high range, summarised in the phrase of the *cunto*, as I previously illustrated. For example, in bar 11 the pitches characterising the letter *s* (first two movements) include both some fundamental pitches (G2, F#2, D#3 and E1) and some overtones (D#4, F#4 and D4). If one observes the figure corresponding to the same letter in bar 30 (first two beats), it is possible to notice that there is only the fundamental pitch D#3, and the chosen overtones are D#4, A#4, C5, F#5, G#5, G5, A#5 and B#5.

When the written text was analysed, the letters were not uttered in isolation. They were analysed in the context of the text to which they belonged. I noticed that the spectral content of a letter depended on the letters that preceded and followed it.[39] Since it would have been impractical to differentiate each letter in all the possible contexts, I decided to keep the results of one case per letter and not to use the others. Moreover, the amount of material produced would have been far beyond what was needed for the

39 The ‘e’ sound in the word *re* has a different spectrum if compared to the one produced by the same letter within the word *senza*. The presence of the ‘r’ in the first case, and of the ‘s’ and ‘z’ in the second, influence the spectrum of the vowel.

purposes of the piece. The only case in which I considered a second group of pitches is that of the syllable *-rti*, since it characterises the ends of the four phrases in the central part of the piece. This element was, in fact, used to build a cadence situation and tighten the formal structure of the piece to that of the nursery rhyme. This choice led to the following group of fundamental pitches:

Letters	Fundamental pitches
R	G#1, F#2, F3
T	D0, A#1, A2
I	F0

Table 3.3 – fundamental pitches in -rti

Within the cadence, the lowest voice moves from C to F as in a perfect cadence (V–I) in F minor with an anticipation of the third pitch, Ab.[40] This cadence can be found, in slightly varied forms, at bars 29, 43, 58 and 74.

Since letters repeat themselves in the text, and given the association they have with groups of pitches, it is obvious that some harmonic situations occur more than others within the whole composition. This explains one of the similarities with Cerha's piece and illustrates how sound objects can be explored vertically – that is, by being filtered in a different way every time they recur. Moreover, the kind of structure I developed, in which fundamental pitches resonate thanks to the use of the *sostenuto* pedal and to the hitting of its overtones, conceals a sort of additional synthesis. The resulting sound is built by the addition of the overtones of the note in the right hand and those which are stimulated as resonances in the silently pressed string (which is free to vibrate). In addition, the silent change of the muted notes is used to modify the resonances added to the keys hit by the right hand. The same concept of addition is key to *Für Marino*, although the process there is realised with the sustaining rather than the *sostenuto* pedal, and with the actual superimposition of notes in the fastest sections.

40 The anticipation is a kind of advance sounding of a note. It is rhythmically like an upbeat to the note anticipated, to which it is usually not tied (Piston, 1978: 117).

4. NARCISO

for baritone solo (2013)

In the present chapter, I will describe how playing techniques and formal structure in the piece *Narciso* derive from the figures of speech in texts by Pier Paolo Pasolini, while the correspondence between textual fragments, expressive indications and theatrical actions originates from the semantic content of one of the four selected poems. Moreover, I will illustrate how filtering processes were applied to rhythms, text and playing techniques. The chapter will end with the description of the methodology employed to retrieve information from the analysis of five vowels, when sung on the same tone.

4.1 From the choice of text to expressive indications, playing techniques and formal structure

In summer 2012, baritone Alexey Kokhanov contacted me to collaborate for a recital he had to hold in spring 2013 at the Flanders Operastudio in Gent.[41] He asked me to write a piece for him on a text by Pasolini which related to the theme of longing. We both agreed to choose a text written in Friulian,[42] and, after much reading, I identified four poems which could be satisfactorily used to shape my composition:

Dansa di Narcìs
Agreste n.3
Li letanis dal biel fi
Dulà ch'a è la me patria

In the piece, the only text which is uttered in its entirety comes from the first of the four poems above listed. Only one and a half verses are taken from the second poem and two verses from the third one. The function of the fourth poem is purely structural: the semantic content of some of its verses determines the choice of expressive

41 Kokhanov and I had previously worked together during the Taschenopernfestival 2011, when he had performed in my chamber opera *Versteinerte Flüge* in Salzburg.

42 Thanks in part to Pier Paolo Pasolini and his production of poems and other forms of literature in Friulian, this language has at last been recognised as a language and no longer considered a dialect (Siciliano, 2005).

indications and theatrical actions, which are used to suggest a plot to the performer and a personality to the audience (Anhalt, 1984).[43] I chose this fourth poem because it is connected to the theme of longing, and I thought that it could be the poem that better embodied both Pasolini's desire and my own for a different future for our country. The poem is particularly expressive, because it is permeated by disappointment and anger, which clearly shine through the many figures of speech and punctuation. This is why I decided to derive from it all the expressive indications of the piece and some theatrical actions.[44] For example, to the verse 'La patria a è par me na seit sierada ta un sen arsit dal sec'[45] I associated the expressive indication *Flebile*, because, when one's throat is dry and burned, uttering words is painful and the resulting sound is weak. This idea a;sp suggested a vocal technique: the singer is required to inhale while performing some specific sections of the piece such as bb. 23-24. To the word 'gnoransa'[46] I associated the idea of dream, since, when one is ignorant, one does not have the necessary tools to interpret reality and, therefore, one can only live in a state of dream. From this association, the expressive indication *Sognando*, the murmuring technique and the action of quietly walk up and down the stage derived. The dreamy atmosphere of the second poem is the reason why two of its verses are associated with this section. For example, the words 'crous dal lavour'[47] suggest that workers often die because of unsafe work environments. Therefore I thought of someone falling under the weight of a cross,[48] and included a similar gesture for the performer.

Figures of speech in the first two poems played a fundamental role in my compositional process, since they affect the formal structure of the piece, the vocal techniques employed in it and how musical figures are conceived and positioned within the structure. The first poem is based on an antithesis.[49] The environment described in the text along with the grouping of words such as 'brami sensa sen', 'sclariva' and 'not', 'scuriva' and 'clar' contribute to generate a sense of contrast between light and darkness.[50] The author's intention might have been to generate a duality between

43 Anhalt observes that the presence of a singer who does not interact with the audience, utters sounds which are not intelligible or have lost their meaning, and shows the alternation of different states of mind through the interpretation of expressive indications, generates in the audience the idea of a portrait.
44 See Appendix 2.
45 'Homeland is to me thirst in the chest burnt by dryness'. My translation.
46 'Ignorance'. My translation.
47 'Cross of labour'. My translation.
48 Christ falls on his knees under the weight of his cross on his way to Golgotha.
49 'The rhetorical contrast of ideas by means of parallel arrangements of words, clauses, or sentences.' (Merriam-Webster, 2015)
50 See translation in the Appendix 2.

Narcissus's world and that of his reflection. In contrast, the second poem is characterised by the presence of sunlight. One can imagine the snow glittering in the sun, while birds fly high in the sunny sky where the warmth of spring is already present. These contrasts are mirrored in the structure of my piece, which alternates singing with speaking. Moreover, the range in which the singer has to sing at the very beginning of the piece is more usual for female voices, and the consequent duality between what the listener expects and what is perceived mirrors the duality innate in the myth of Narcissus. A second figure of speech – alliteration[51] – can be easily identified in the first poem. An example can be found in the fourth line, when the words 'sensa sen' are positioned before 'soj'. In the second poem, alliterations are placed beside triple repetitions. This further element is the link to the third poem, *Li letanis dal biel fi*, where several triple repetitions of the name 'Jesus' occur. It is beyond my intention to know whether Pasolini used it in order to allude to the triple essence of God in the Christian tradition or if it was just meant to generate a *crescendo* in emphasis. It was, however, of particular interest for me to notice that triple repetition is present also in *Agreste n.3* in a form that resembles the musical process of varied repetition. This is how I interpreted the sequence 'als, als, als', followed by 'A sgrisulin, a uitin, a piulin'[52] – that is, as a single element in two different stages of development. After the first two repetitions of the triple element 'als, als, als' in bb. 2-4 and 6-7, when one hears 'a sgrisulin, a uitin, a piulin' in bar 9 it is only natural that one associates it with the earlier triple element (see Figs 4.1 and 4.2). The elements in Fig. 4.2 clearly derive from those in Fig. 4.1, since they differ only in being preceded by C3 or B2 and by the reordering of the two upper pitches. In addition, it is possible to notice that the alliterations in the first poem occur in a triple form as well. In a phrase such as 'Amour, rosignoul, flour' or 'ciantant, ciant, dismintiat',[53] the diphthongs 'ou' and 'ia' are positioned within different words, and this entails a transforming sound with a constant core.

This non-semantic approach to text, and the filtering techniques applied to repetitions of a certain material (described in the following section), resemble the methods Dieter Schnebel employed in his vocal music between 1958 and 1968. He acknowledges the innate progression of sound in a text and uses the International Phonetic Alphabet (IPA) 'to notate minute differentiations within the [vocal] sounds' he

51 'Repetition of consonant sounds in two or more neighbouring words or syllables.' (Merriam-Webster, 2015)

52 'High, high, high', and 'They twitter, chirp, cheep'. My translation.

53 See translation in the Appendix 2.

composes himself (Gee, 2013: 180). In similar ways, my procedure not only includes the act of composing by progressively modifying sequential repetitions of a textual element, but also reorganises the text to highlight sound similarities which are already present in the original text. In addition, the lack of a context for the textual fragments used and the varied repetitions of elements in an unusual range are functional to the picturing of a natural environment and were used to resemble animal calls.

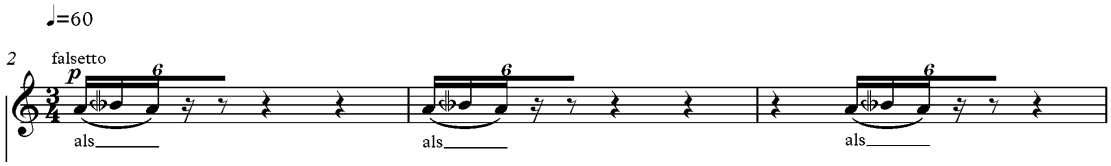

Fig. 4.1 – bars 2-4

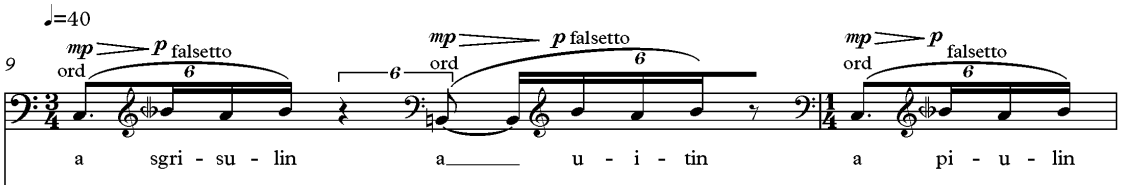

Fig. 4.2 – bars 9-10

4.2 Filtering processes

Various filtering processes were applied to the material so that rhythm, text and vocal techniques continuously evolve within the piece. Since in *Dansa di Narcìs* a line-count of six syllables is the most frequently used, I decided to employ sextuplets as the core element in a sequence of repetitions that is filtered with a different filter according to the section of the piece in which it is positioned. An example of the process can be seen in Fig. 4.3.

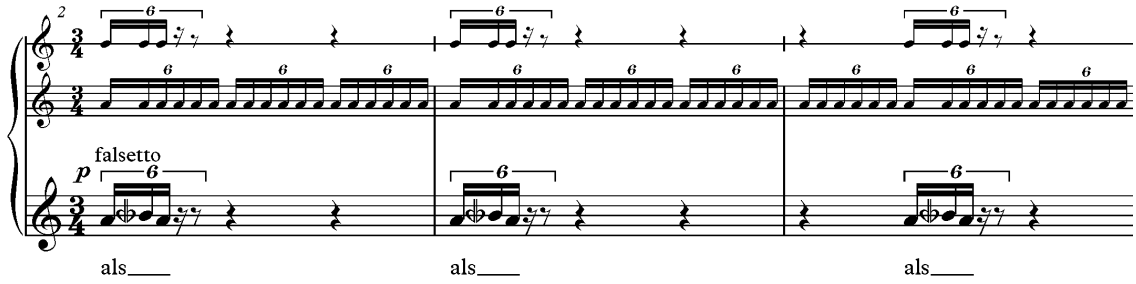

Fig. 4.3 – Rhythmic filter applied in order to produce bars 2-4

The first line shows the filter, while in the second a sequence of sextuplets has been positioned. As a result of the application of the filter, one obtains bb. 2-4 as shown in the third line of Fig. 4.3.

Another rhythmic filter was built for bb. 9-10 (see Fig. 4.4), so that between the elements in these bars and those in bb. 2-4 the relationship is still strong and they can be conceived as two versions of the same element.

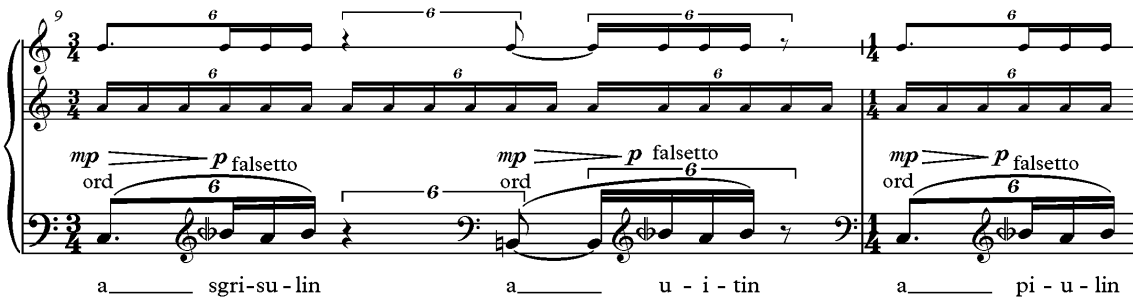

Fig. 4.4 – Rhythmic filter applied in order to produce bars 9-10

Filters, along with other musical features, were built in order to support the expressive indication in the bars for which they were designed. For example, the elements in bb. 14-17 become more and more fragmented and contribute along with a continuous *diminuendo* and a progressive liquidation of the text[54] to preparing the

54 Through this process, I tried to neutralise the semantic content of text. The word 'soj' is at first used entirely, but further on, in bar 17, it appears without the consonant 's'. Moreover, since my thematic material in terms of text is the triple repetition of some words or group of words, I use a liquidation process in order to extinguish repetitions in the final cadence. Arnold Schoenberg, in fact, 'theorised [the way in which] liquidation, or the dissolving process of the motivic content, usually led to a cadential progression, a caesura, which creates a temporary closure to avoid and counteract "the

expressive indication *mesto/with resignation*. This way of operating in terms of rhythm is very close, although much simpler, to the principle whereby rhythmic patterns in the fourth movement of Brian Ferneyhough's Fourth String Quartet are extrapolated from those of the first movement (Fitch, 2013). In fact, I generated a series of filters connected to a sextuplet, just subdividing or tying its elements or substituting them with rests.

Elsewhere, groups of semiquavers can be found; these were used to contribute, in the domain of rhythm, to the idea of antithesis which is at the basis of the piece. The text is built on it, the structure is a constant alternation between speaking and singing and, further, I will describe how the pitch domain too was articulated into two groups. The rhythm, then, can either belong to the group of filtered sextuplets or to the rest of the rhythms directly derived from the text. My original concept associated rhythms from the second group with spoken areas but, as the compositional process proceeded, some of these bars were also integrated in the sextuplet areas in order to accentuate contrasts.

The process of filtering was not applied only to rhythms. I developed textual filters that gradually cut the consonants of a word repeated by the singer, who ends up alternating two vowels (bb. 52-53 – see Fig. 4.5), and I realised a process of filtering whereby the singer is required to pass as smoothly as possible from one technique of sound-production to another (bar 54 in Fig. 4.5). Similarly, in *für stimmen III* (1968), Schnebel realises a process of filtering by changing singing techniques so that a series of gradually transforming sounds is generated (Gee, 2013). The inclusion of animal voices on the tape and the deconstruction of the texts also constitute another connection between Schnebel's work and *Narciso*, since both of them aim at 'disconnecting the human voice from its familiar territory of language' (Attinello, 2007: 49).

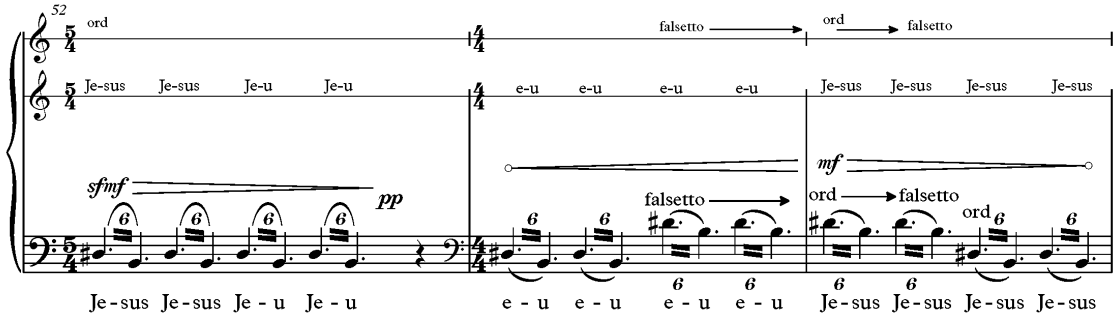

Fig. 4.5 – Filterings of text and of vocal technique in bars 52-54

tendency of unlimited extension" of thematic material' (Dudeque, 2005: 159).

4.3 Methodology employed for the analysis of the spectrum of five sung vowels

In order to mirror in the realm of pitch organisation the concept of duality, which as mentioned earlier is at the basis of several other aspects of the whole piece as well as of Pasolini's poems, I thought of grouping the pitches retrieved from the spectral analysis into harmonics and inharmonicities.[55] This distinction was employed by Gérard Grisey to distinguish eleven repetitions of the same sonority in his *Partiels* (1975), so that a progressively higher number of inharmonicities is present and a transition between the original timbre and an almost totally inharmonic situation is realised (Rose, 1996). Nevertheless, in *Narciso* the distinction between the two groups is used in a way which is closer to traditional harmonic practice. The inharmonicities are used to create more or less temporary excursuses from the harmonic areas. For this purpose, I recorded myself singing the vowels 'a', 'e', 'i', 'o' and 'u' on the pitch F3 and analysed the sonogram of the recording (see Fig. 4.6), which was produced with the software SPEAR.[56] Subsequently I produced a report including the partials louder than -60dB, and, after selecting five instants each corresponding to one of the five vowels, I manually extracted from it the loudest overtones and inharmonicities of F3. The first system in Fig. 4.7 shows different groups of overtones on F3, while the pitches in the second system are inharmonicities.

In Chapter 2, I described how I analysed the syllables *om-*, *-er-* and *-tà*, sung by the singer performing *Omertà*, to retrieve the pitch material to orchestrate the windows in *Omertà II*. In that case, I first identified the fundamental frequencies and later extracted their overtones, because the syllables had been sung on different pitches. Since in *Narciso* the vowels were sung on the same pitch, I already had a base on which to build a harmonic or inharmonic series for each of the vowels. Subsequently, I decided to build motivic figures so that they mirrored the harmonic structure of the spectrum of the vowels involved. For example, the figure corresponding to the words 'a sgrisulin' in bar 9 (see Fig. 4.4) derives from a transposition down two octaves of the harmonics on the vowels 'a' and 'i', which characterise these two words. This also explains why I chose F3 as the pitch on which to sing the five vowels: I needed a range which can cover both the chest and head registers of a baritone. This procedure resembles the correspondence between the pitches and the colour of the vowels built by Jonathan

55 Inharmonicities are tones whose frequencies are not whole-number multiples of a fundamental frequency (Rose, 1996).

56 An application for audio analysis, editing and synthesis.

Harvey in his *Mortuos plango, vivos voco* (1980). To high pitches he associates vowels with high formants, while back vowels are positioned in connection with low pitches (Murail, 2005b). The idea of analysing the spectral content of sung vowels originates from my observation of how Pasolini displaced them in the lines of *Dansa di Narcìs*. It should also be apparent how another antithesis was built here, by means of the alternation of verses in which back vowels are predominant and verses in which almost only front vowels are used. Claudy Malherbe, too, used data extracted from the recording of vowels sung on the same pitch, and, in particular, he analysed a fragment of Luciano Berio's *Sequenza III*, in which the singer alternates two vowels on a high-pitched D, in order to build his composition *Locus* (Malherbe, 2008). In that case, though, he used another kind of analysis, which I will mention further in Chapter 7 and which turned out to be very useful to me when I wrote *White Mask* and *Cera*.

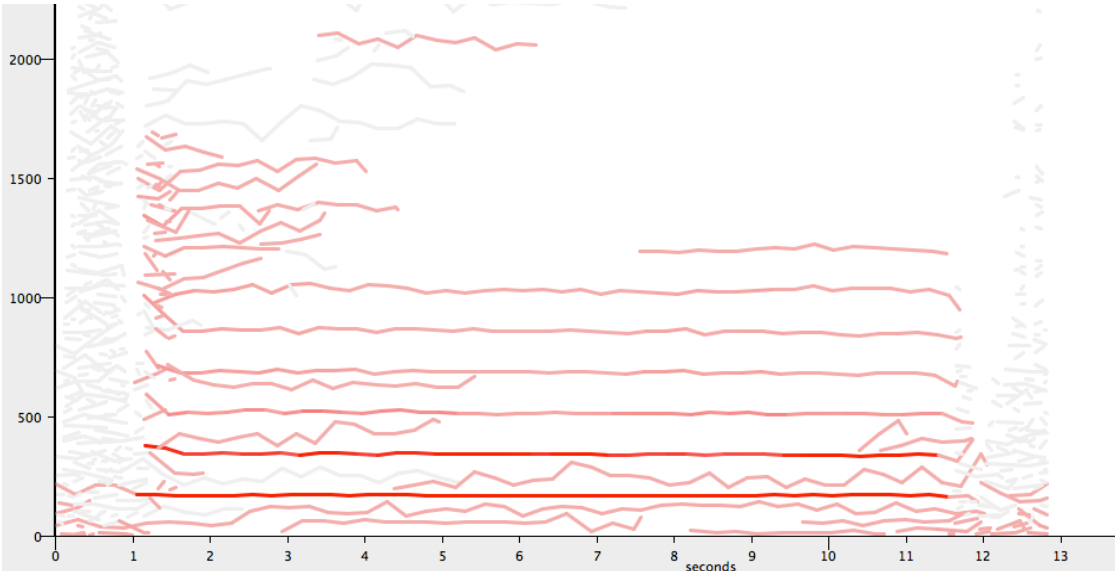

Fig. 4.6 – Sonogram of the five vowels sung on F3. Partials over -60dB are highlighted

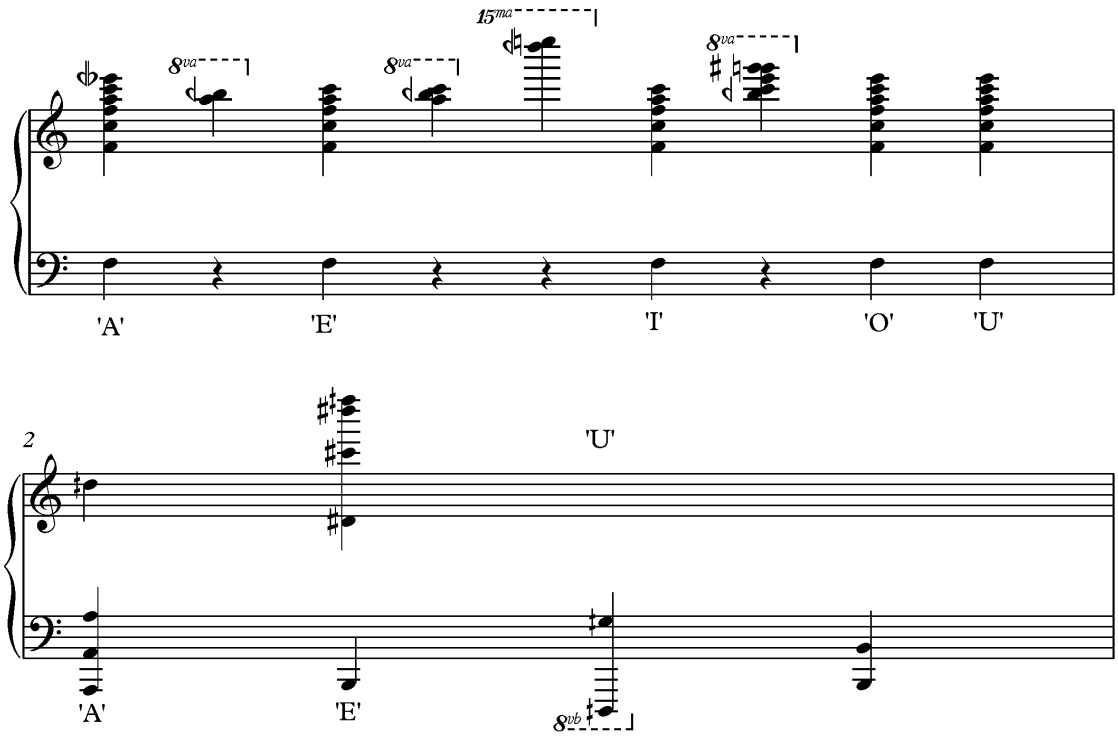

Fig. 4.7 – Harmonics of F3 (first line) and inharmonicities (second line) on each of the five vowels

5. T-O

for five voices (2013)

In the first paragraphs of this chapter, I will illustrate a manner of choosing texts in order to suit the political background of a particular project in which I was involved. Their functions as sung text or as text from which ideas have been derived will be specified, and their displacement in time as a written echo, partly modelled after one of Giovanni Gabrieli's motets, will be illustrated. The last section will be dedicated to the description of the audio material employed and of the methodology used to analyse and process it with the purpose of retrieving melodic lines and setting a frame for the formal structure of the piece.

5.1 Languages, borders and migration

In 2012, I was invited to take part in *Mediterranean Voices*, a project organised by Musik der Jahrhunderte that brought twelve composers from countries on the Mediterranean Sea together with an architect and a video-maker, to investigate cultural identity and the artists' own positions in relation to their countries of origin. The project entailed the production of twelve compositions for the vocal ensemble Neue Vocalsolisten, which were premiered in Stuttgart at ECLAT 2014 and also performed at MATA Festival 2014, at Teatro de la Zarzuela in Madrid, at the 2014 Venice Biennale and at Centro Kursaal in San Sebastian.[57]

5.1.1 Background and sung texts

Since within the project particular emphasis was placed on migration across the Mediterranean Sea and since I come from Trieste, a city on the border between Italy and Slovenia, and had witnessed migration during the wars in the Balkans in the 1990s, I decided to focus on the image of refugees stranded at sea. This reminded me of the myth of Helle and Phrixus, fleeing on the Golden Fleece, and of how Christianity made up stories about monsters with seven heads and ten horns living in the Mediterranean

57 For more information about the project, see my website www.silviarosani.webs.com.

Sea to discourage navigation. These two elements can be found in one of Predrag Matvejevic's books (Matvejevic, 1999), from which I also decided to quote a fragment (see performance notes). The group of five singers was consequently divided into two groups, of two and three singers respectively: the former embodying Helle and Phrixus, and therefore all refugees lost at sea,[58] the latter embodying the monsters/Christianity and the effects of post-traumatic stress disorders (PTSDs), with which refugees have to cope if they survive the highly risky trip to Europe.[59] An additional element inspired by Matvejevic's writing was the title, the explanation of which can be found in the programme notes (see Appendix 3).

The second kind of textual material I included in the work is fragments from two poems by Carlo Stuparich, which appear in his brother Giani's *Ricordi Istriani* (Stuparich, 1979). These texts remind me of my first experience with migration and of Istria, a territory which now belongs to Croatia but which in the past hosted people from all over Italy, and in which a mixture between Venetian dialect and Slavic was spoken (Tomizza, 1992). Migration entails the crossing of borders and of languages, and language is the element with which Italo Svevo builds the paradoxical situation at the end of his *Zeno's Conscience*, when describing how Zeno was surprised in no man's land at the start of World War I (Robinson, 2007). All these considerations led me to develop the text treatment that I illustrate in the following section.

5.1.2 Text treatment and echo displacement after a motet by Gabrieli

The lines of the trio in my piece are conceived as an echo of the lines of the duo. Nevertheless, the 'echo' starts first, so that the whole piece could be easily restarted, once finished, without arousing any notice. In this respect, the piece was conceived as an installation. As a general approach, I first identified a series of rules to generate echoes from the bars of the duo and defined groups of letters that should be progressively included. Subsequently, I positioned the echoes so that I could shape a progressive transformation between, on the one hand, sounds similar to animal calls and

58 In turns, the second soprano and the countertenor produce a sound based on the fricative *f* to accompany each other; the resulting sound is similar to what happens when one tries to talk while travelling on a boat, with the wind pushing the words back into one's mouth.

59 Some of the effects of PTSDs are delusions and the continual reliving of traumatic memories. People who have experienced a war situation, who then have to face a dangerous trip to reach Europe, and sometimes live for months or even years as illegal migrants before being recognised as war refugees, are very likely to develop PTSDs (Van der Veer, 1998).

deprived of their connections to text (and therefore of semantic content), and on the other hand, melodic lines in which text is used in a quite traditional way. This organisation of the textual elements allows the text to emerge from sound and to become intelligible to the listener. This way of organising the textual elements resembles that employed by Karlheinz Stockhausen in *Gesang der Jünglinge* to explore the threshold between speech and sound (Stockhausen, 1964). I developed six kinds of echoes, classifiable as follows according to treatment of text, melodic line and playing technique:

echo 1: deprived of almost all consonants and quite static in terms of melodic intervals;
echo 2: emphasis on consonants and quite static in terms of melodic intervals;
echo 3: mixture between cicada calls and original material, whose melodic lines are usually preserved;
echo 4: emphasis on consonants with melodic lines preserved;
echo 5: deprived of some textual elements with melodic lines preserved;
echo 6: use of extended techniques.

In order to clarify how these echoes were conceived, I will describe their derivation with some examples. The material the trio uses in bb. 1-3 derives from either bar 4 or bar 6. The three voices employ uniquely the vowels from the words *é un*, and do not change pitch unless it is to trace a minor second interval, A-G#, as the second soprano does in bar 6. This kind of echo clearly belongs to the first category. In bb. 32-33, there are three different kinds of echoes of bb. 16-17. The tenor uses only vowels and moves with major seconds around a pitch, therefore still realising echoes belonging to the first category. The first soprano includes the *t* and *a* from the word *terra*, and imitates the repetitiveness of cicada calls. Although the melodic line is not preserved, this kind of echo can be understood as belonging to the third category. The bass alternates between echoes of the fourth and fifth categories. The methodology used to deduce rhythm and pitch for the trio's lines will be illustrated in the next paragraph, since both elements are connected to the spectrum of animal calls.

Besides generating the connection to a non-human animal/monster, the idea of writing echoes by shaping different levels of text deconstruction allows me to shape a space. At the beginning of the piece, echoes occur with a certain frequency and do not

overlap with the source of the sound. As the composition proceeds, though, they occur more and more frequently, hence overlapping with their source. This structure gives the idea of a slowly narrowing space. From the open space of the sea, in fact, we move towards the space in the mind of a person affected by PTSDs, in which traumatic experiences are relived obsessively. Since I decided to use echo effects, I chose one of Giovanni Gabrieli's motets to observe how he had realised them. It is well known how the sixteenth-century composers whose music was performed in St Mark's Basilica, Venice, used the technique of *cori spezzati* – whereby performers would be positioned in different parts of the church, hence generating an echo effect with the others – but also included written echo effects in their compositions (Arnold, 2014). In Gabrieli's *O Domine Jesu Christe*, it is possible to observe that there is an intensification of the echo effects. At first, echoes appear after the source stops resonating, but further on in the piece, echoes are usually shorter, developing in rapid antiphonal dialogue with the source. This intensification corresponds to the evolution described at the start of this paragraph in my own piece, and it leads to moments in which singers from different groups are even synchronised, for example in bar 77.[60] Nevertheless, the process occurs in an irregular way, because the simultaneous deconstruction of the text in the duo's lines and reconstruction of it in the trio's lines subverts the perception of the roles of the two groups.[61]

5.2 Analysis of cicada and fox calls to shape melodic lines and formal structure

Two different motivations led me to the choice of the audio material on which *T-O* is based, and I will describe them in the present paragraph along with the methodology used for the analysis. One recording includes cicada calls, recorded near the Slovenian border on the plateau surrounding Trieste, when the video-maker and the sound technician joined me to shoot the videos which were included in the video installations for the project.[62] Later, I decided to use this sound to organise the rhythm of the figures given to the trio. The second recording provides the pitch material of the whole work and includes a fox call, which I found particularly similar to the high-pitched voice of a

60 Countertenor and tenor sing the word *nasce* at the same time.

61 At a certain point, one might, in fact, start questioning whether the trio even *is* the echo group and the duo the source group.

62 For more information about the video-maker and the sound technician or to watch the videos, see http://neuevocalsolisten.de/mevo.html

woman uttering the question 'Why?' This choice relates to the theory of *the other* outlined in the Introduction – that is to say, I identified the fox as a non-human animal and recognised myself in it because its utterance resembles speech. It further relates to the question I sought to raise with my piece, as expressed in the programme note (see Appendix 3): *How does western society deal with PTSDs and how do they influence the public's perception of migration?*

The analysis of animal calls to retrieve data for use in a composition is not an unusual procedure. As I specified in the Introduction, Tristan Murail analysed frog and loon calls for his *Le Lac* (2001). Moreover, Trevor Wishart analysed animal calls, for example those of bees, to 'seamlessly metamorphose [syllables] into emerging events' in his *Vox-5*, and evoked transitions from animal-like to human utterances in *Vox-2* (Wishart, 1989: 196). Wishart's use of some sort of 'pre-linguistic text' to link animals to humans is very close to the transitions I develop in *Narciso* and in *T-O*, when the trio's voices mutate from monster-like utterances to PTSD-like auditory hallucinations.

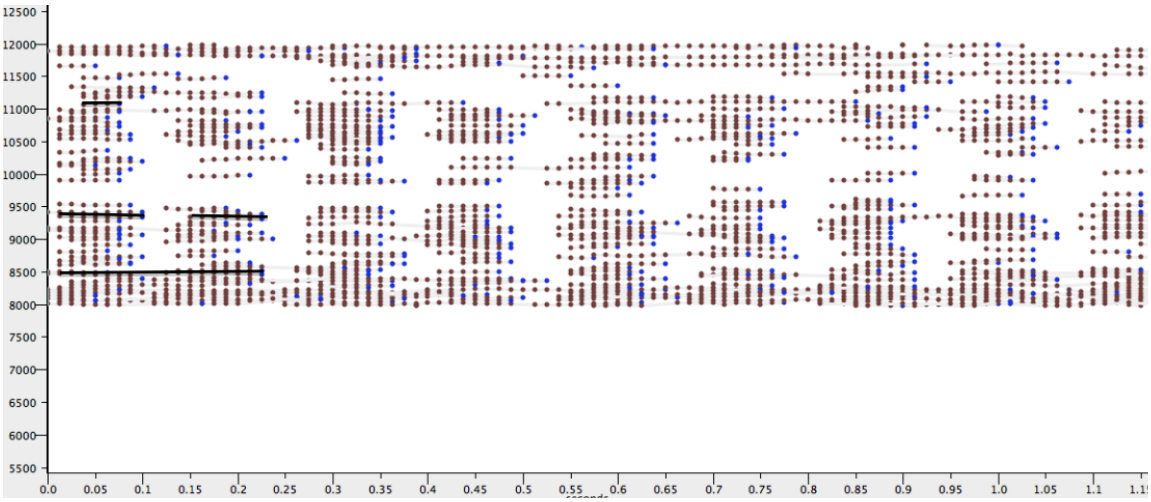

Fig. 5.1 – Fragment of the sonogram of cicada calls recorded in July 2013

The figure above is the beginning of the sonogram of the cicada calls,[63] while the segments I have drawn to connect some dots represent the durations I assigned to the first soprano's, the tenor's and the bass's lines. If one compares the numbers of dots in those segments to the number of demisemiquavers in bb. 1-3, one will find that they correspond. For example, the upper segment slightly above 11,000Hz corresponds to the first soprano's line. The first two dots at that frequency are missing; therefore the singer

63 The software used to produce it was SPEAR.

starts with two demisemiquavers' rest (i.e. one semiquaver). The segment is four dots long and this corresponds to the soprano having a sound to sing which lasts four demisemiquavers. From the long segment at the bottom, it is clear that the bass will be singing for 18 demisemiquavers, before a rest of two demisemiquavers. The two segments in the middle correspond to the line of the tenor, who sings for eight demisemiquavers, pauses for three and sings again for seven demisemiquavers. This methodology turned out to suit particularly well my intention to realise a material which resembled animal calls and, since it is very flexible in terms of groupings, I could apply to it the progressive textual development.

In order to retrieve the pitch material for the trio, I first simplified the sonogram of the second recording by deleting the partials which are below the dynamic threshold of -35dB and whose durations are shorter than 0.8 seconds.[64] The result is shown in Fig. 5.2.

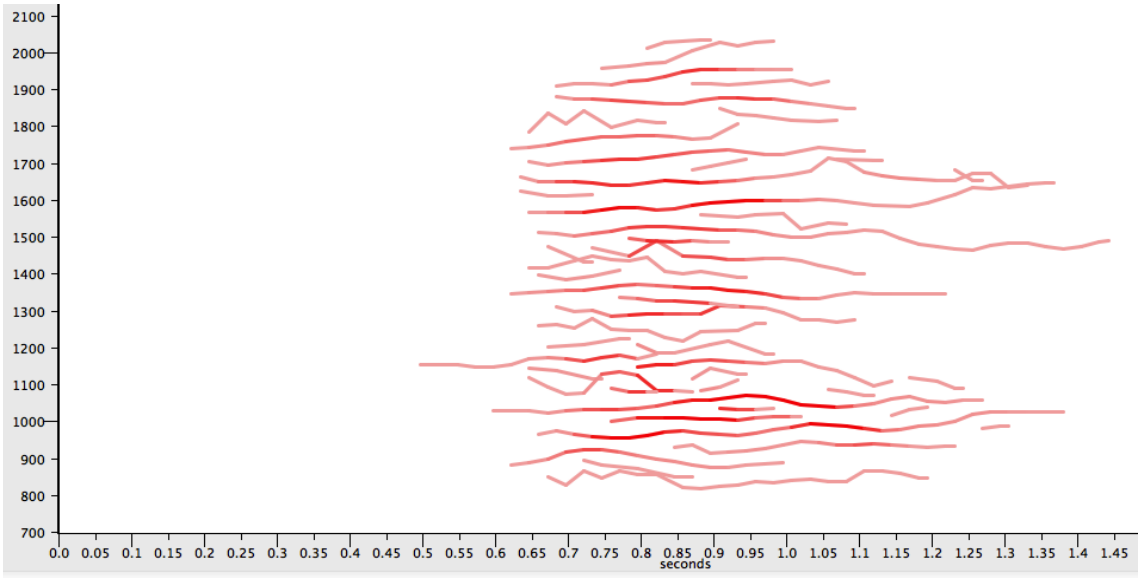

Fig. 5.2 – Sonogram of a fox call whose partials are louder than -35dB and longer than 0.8 seconds

Subsequently, I chose eight instants, selected the loudest frequencies in each of them and manually deduced their fundamentals (see Fig. 5.3). The pitch material assigned to the trio is based on these fundamentals and their overtones, even if not necessarily belonging to the sonogram.

64 For this operation the software SPEAR was used.

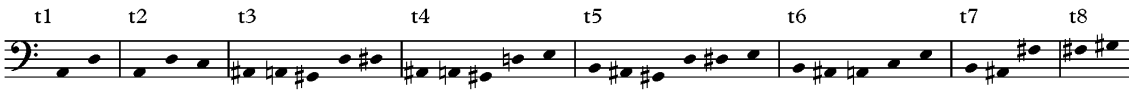

Fig. 5.3 – Fundamentals corresponding to eight instants

In order to identify motifs which could be used in the duo's lines, and further pitch material for the trio, I chose the longest partials, and expanded them in terms of frequencies and time so that I could retrieve a group of melodies whose intervals are not smaller than a semitone – and therefore easily singable. An example of how the expansions have been realised can be found in the table below.

Time frames	Factor	Expanded time frames	Frequencies	Differences interpreted as cents	'Expanded' frequencies	Pitch
0.646168	X20	12.923360	1785.24			A6
0.658594		13.171880		(1839.94-1785.24)*20 =54.7*20 =1094	3358.424749	G#7
0.671020		13.420400				
0.683447		13.668940	1839.94	639.8	2320.793301	D7
0.695873		13.917460	1807.95	689.8	3456.834106	A7
0.708299		14.165980				
0.720726		14.414520				
0.733152		14.663040	1842.44	860.8	2102.517832	C7
0.758005		15.160100	1799.4	595	2964.834080	F#7
0.782857		15.657140	1829.15	203.2	2636.793705	E7
0.795283		15.905660	1818.99	48.2	2711.237263	E#7*
0.807710		16.154200	1821.4	193.6	2424.383681	D#7
0.820136		16.402720	1811.72			
0.830000		16.651240				

Table 5.1 – Expansion of time frames and frequencies[65]

* As a general principle, I approximated pitches to the nearest semitone, but in this case, instead of E7, I chose E#7 because this melodic fragment is used in the double canon by the two female voices and I needed five different pitches.

The methodology I have described resembles the way Murail worked with the

65 To calculate the new frequencies, I used the tools on http://www.sengpielaudio.com/calculator-centsratio.htm.

recording of Mongolian diphonic singing to develop some melodic elements in *L'Esprit des dunes* (1994), although he filtered the sound sample in order to transcribe some specific fragments of its partials, thus ensuring a clearly defined melodic element. Another similarity between *T-O* and Murail's work is that he too did not use the data as they resulted from the analysis, but applied a distortion.

There is also one further distortion to be mentioned. The melodies, extracted as described above, were transposed two octaves lower and fragmented into short motifs, but their reciprocal simultaneities were kept, along with those of the fundamentals described above. Since I had planned to start the piece with a duo and to manage the trio as an echo of it, whose delay is progressively shortened (hence developing a progressive crescendo until a climax is reached), I thought of retrograding the material extracted from the sonogram. Therefore, the sound itself, once reversed, can be regarded as a model for the formal structure of the overall piece. This approach can regarded as similar to how Grisey shaped the whole structure of *Les Chants de l'amour* on the sentence 'I love you'.

The seven retrograde melodies are shown in Fig. 5.4. It is possible to notice a correspondence between the last column of Table 5.1 and the pitches in the first staff of the lower group of melodies, if one starts from the end and moves toward the beginning. The melodies grouped by the upper bracket are used by the duo, while those grouped by the lower bracket are employed by the trio.

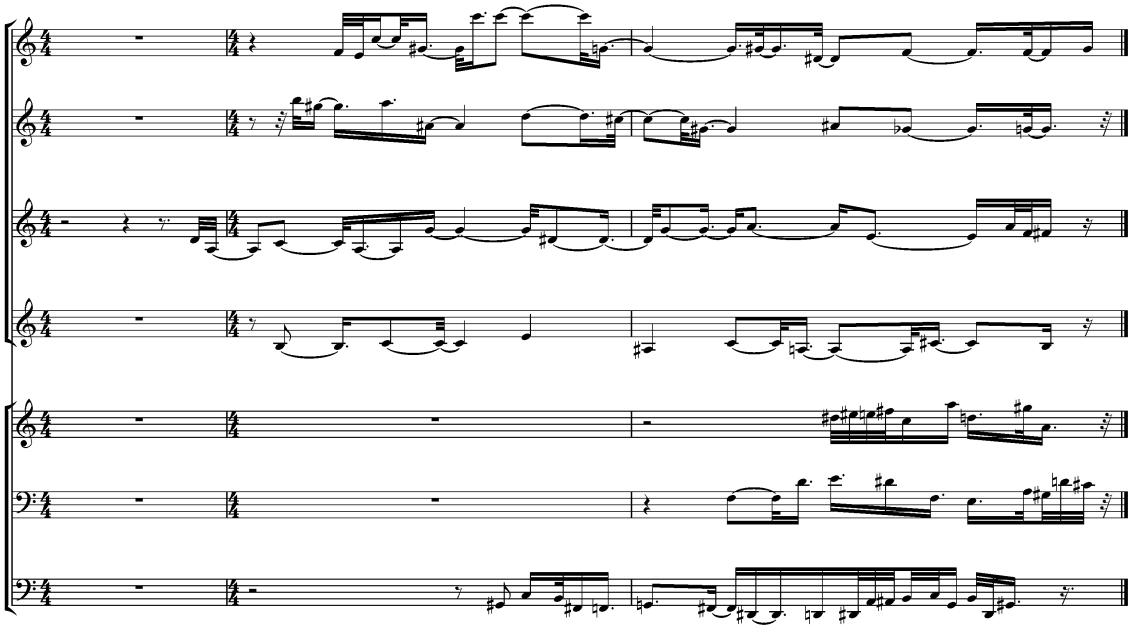

Fig. 5.4 – Retrograde melodies extrapolated from the expansion of some of the partials

Nevertheless, an exception to this rule occurs in the double canon at bb. 82-94, in which all male singers employ pitches extracted from the last staff in Fig. 5.4, regardless of their octave. The female voices use the fragments D#5-E#5-E5-F#5-C5 in the fifth staff and, later, countertenor and tenor join too. The canon is a form which was highly developed in Europe in the sixteenth century (Mann, 2015) and I chose it as a symbol of this continent, the destination of many migrants' journeys.

6. WORKING WITH A SOUND POET: *Controller* AND *Die Elbe* (2014)

In the present chapter, I will describe how *Controller* and *Die Elbe* originated from the collaboration with Hungarian sound poet Kinga Tóth. In both cases, most of the sound material comes from the voice of the poet herself, which was recorded reading and performing her own works. The methodologies employed for the development of the pieces and their relationship to Kinga's texts will be hereafter illustrated, along with the choices made in terms of spatialisation of the sound and live electronics.

6.1 *Controller*

for voice and live electronics (2014)

Kinga and I first met in Stuttgart in 2013, when we were both fellows at the Akademie Schloss Solitude. My residency there was explicitly related to my cooperation with the Neue Vocalsolisten, but, whilst working on *T-O*, I managed to arrange some recording sessions with Kinga, whose approach to poetry and extensive use of vocal extended techniques particularly appealed to me. At the time, she was working on a German translation of *ALL MACHINE*, her new collection of poems, and explained to me how her work depicts the relationship between human beings and machines, while telling stories which touch on social issues such as aggression or the role of women in traditional Hungarian families. She invited me to collaborate on her book launch, which took place in December 2014 at the Hungarian Cultural Institute in Stuttgart. For that occasion, I developed *Controller*, a piece based on two poems from *ALL MACHINE*,[66] in which I would take care of the live electronics and Kinga would improvise with her voice. The second piece I composed for that evening will be described further in this chapter.

6.1.1 Methodology and influence of the text

Since I decided to conceive my work as an extension of the narrative sound-world

66 The original Hungarian texts and German translations can be found in Appendix 4.

Kinga generates in her performances, during our recording sessions she read her own works, but also interpreted them and used glasses to modify her voice's resonance. Similarly, Philippe Leroux had recorded the voice of the poet, Lin Delpierre, reading poems from his anthology *Le Testament des fruits*, and had used the recording of the voice and its resonances in gongs and tam-tams to generate the harmony of his piece *VOI(REX)* (2002) (Leroux, 2008). The sound material used in *Controller* includes the following elements:

> Kinga's voice reading the Hungarian versions of 'Controller' and 'Schneekugel', two poems from her collection *ALL MACHINE*;
> Kinga producing air sounds;
> Kinga producing breathing, whistling or sucking sounds with her mouth in a glass;
> noise produced by tapping or scratching a glass with nails;
> Kinga's voice recorded live during the performance;
> air-sounds produced by a baritone saxophone.

The sounds produced using a glass were used to deliver the idea of a space confined by a glass sphere, while the long air-sounds produced by a baritone saxophone were chosen because they were particularly suitable for filtering.

The piece is clearly divided into two parts, according to its origin in two different, but connected, poems. These texts recount the scene of a man, the Controller, using a machine to control the environment inside a snowball and to keep alive the woman, who lives in the snowball. The first poem describes the state of mind of the Controller and his/her actions,[67] while the second one illustrates the state of mind of the woman in the snowball. Therefore, in the first part of the piece, which is focused on the Controller – that is, outside the snowball –, the sounds are built to describe a machine turning on, adjusting parameters to set the correct temperature in the snowball, measuring the woman's cerebral activities, configuring her memory map, providing nutrients, cleaning her joints, hair and cavities. The spatialisation of the piece reflects this concept as well. Four speakers were employed: one at each side of each performer. The two performers place themselves one in front of the other, at a distance which

67 Although in *ALL MACHINE* the Controller is explicitly male, in performances of the piece I have taken the role myself. Kinga and I liked the idea that, as in a non-traditional family, the stereotypically male/female power dynamic might also exist between two women.

allows the audience to move freely in the space between them. Some of the sounds in the first part of the piece move from the speakers at the side of the Controller to the speaker near the snowball, to indicate the direction of the nutrients and signals. The second part of the piece, which starts after a very quiet sound resembling irregular breathing and a heart beating, is focused on the space inside the snowball. Sounds are muffled, include glass tapping and scratching. The spatialisation of the sound is focused on the two speakers positioned at each side of Kinga.

I will hereafter describe some details of the blocks I built with Pure Data and their function within the piece (see Fig. 6.1). The first block to be activated – MorphosysSax – is the one which plays recordings of saxophone air-sounds and filters them according to the vowels 'o' and 'e' (i.e. the vowels in the word 'controller').

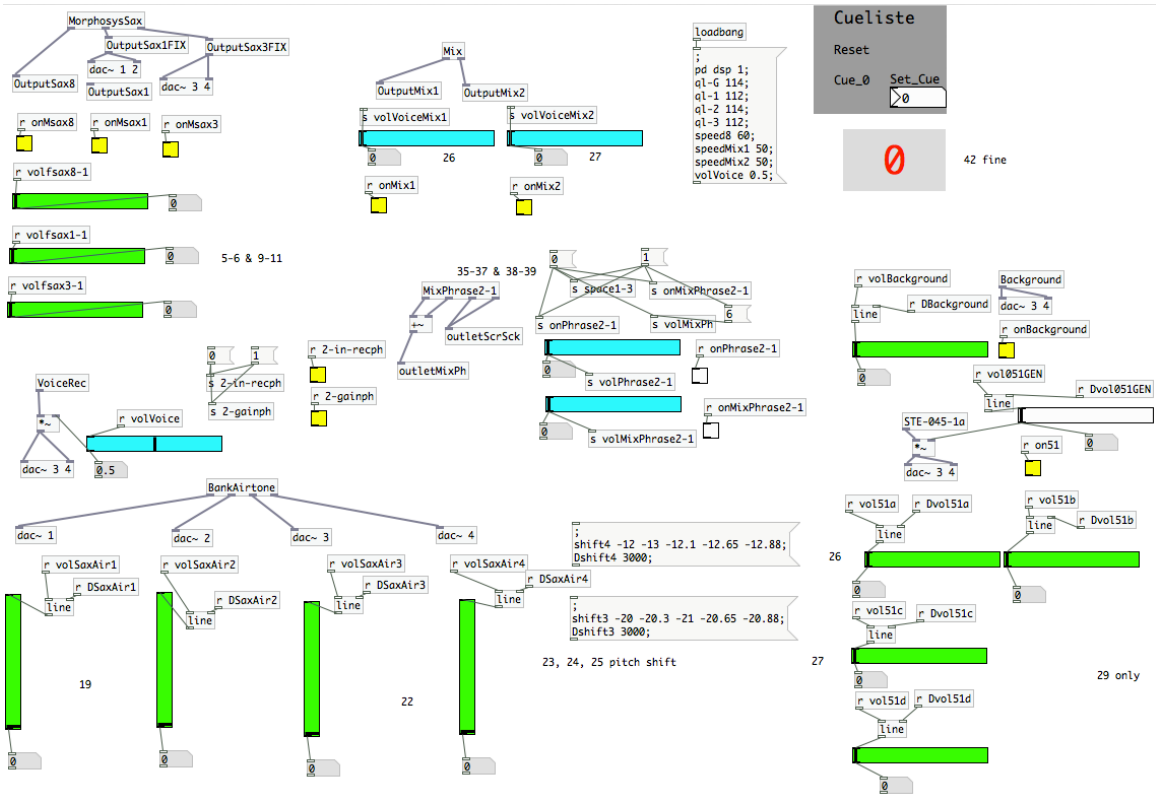

Fig. 6.1 – Main patch developed in Pure Data to manage the live electronics in Controller

The filtering is realised in a smooth way so that, ideally, one can make the transition start when the sound is close to the Controller's speakers and finish when it has reached the snowball. The process can be regarded as an enlargement of the transitions between

two vowels and, therefore, as a *temps dilaté*, so that, although built with electronics and not played by acoustic instruments, it can be related to how Grisey structured *L'Icône paradoxale* by overlapping three different temporalities, when the orchestra realises the instrumental synthesis of the sonogram of the name 'Piero della Francesca', pronounced by the composer himself (Baillet, 2000). Similarly, in James Tenney's *Three Indigenous Songs* (1979), the composer musically transcribes for instruments the sounds of the letters in the lyrics to Jaybird Coleman's song 'No More Good Water', hence dilating a process which is usually compressed into a much shorter time interval (Wannamaker, 2008). The block VoiceRec manages the live recording of the voice during the whole performance and in the intervals chosen by the Controller. Two blocks – Mix and MixPhrase2-1 – multiply Kinga's prerecorded and recorded live voice with saxophone air-sounds and play the resulting signal along with the original vocal signal so that their percentage can be arranged live. This allows the Controller to make the voice emerge from and sink back into noise, lingering on the threshold between the two. When the prerecorded voice is used, the Hungarian text emerges briefly, and this is the only moment in the whole piece when the listener can distinguish meaningful words. This instant refers to what in the poem is regarded as the configuring of the woman's memory maps. Another block routes saxophone air-sounds to the four speakers, after they are filtered according to the central frequencies of the formants of the vowel 'o'. Subsequently, the Controller transposes these outputs so that they slowly move within the bandwidths of the formants of the vowel 'e'. Dynamics are also modified accordingly. The first part of the piece ends when everything goes quiet, except for the sound which resembles a life-support machine and a heartbeat machine. This is generated by a block – STE-045-1a – which filters prerecorded air-sounds that Kinga uttered, and plays them at irregular intervals. The last two blocks – Background and MixPhrase2-1 – used during the performance are the ones playing three different tracks generated with QRT, a real-time soundfile mixing application. Two of the tracks are simply superimpositions of fragments of recordings, in which Kinga was focusing on, respectively, sucking sounds and glass tapping and scratching. The third track was instead built so that the fragments are transposed to mirror the formants of the vowels in the title word, as with the saxophone air-sounds at the beginning of the piece. For example, according to Peterson and Barney (1952), the vowel ɔ has, in the case of women speakers, a first formant at 590Hz, a second one at 920Hz and a third at 2710Hz. These frequencies correspond to the pitches D5, A#5-23cents and E7+45cents.

The distance between the first two pitches is an interval of an augmented fifth, i.e. 8 semitones, which I approximated to 7.5 because of the cents. Between D5 and E7+45cents there is an interval of a major sixteenth, i.e. 26 semitones, which I approximated to 26.5 because of the cents. Since QRT manages transposition up to ±24 semitones, I transposed the first track down 6½ semitones and the other two tracks up accordingly (see Appendix 4).

The voice part is entirely improvised, although Kinga and I agreed on a few points beforehand. We shared the opinion that she should not utter meaningful text, only noise, paralinguistic elements or syllables, to fit with the idea of a woman who is dependent upon and probably less educated than the Controller: on the edge between a human and a non-human animal. We also agreed on her uttering short guttural sounds spaced out by silence during the first part of the piece, so that I could record them and use them in the second part – when they would fit particularly well, once multiplied with the saxophone air-sounds, with the sounds in the three tracks that are played in this section of the piece.

6.2 *Die Elbe*

for flute, voice and cello (2014)

The text on which this composition is based is 'Die Elbe',[68] a poem from the German version of *ALL MACHINE*. The woman around whom the poem revolves has pipes sprouting out of her throat, and is therefore unable to speak or breathe without also producing whistles. This strong sonic image is mirrored in the piece, since the three performers together realise an instrumental synthesis of the voice of the woman along with the whistling – the idea being to build a sort of 'hyper-voice'. For this purpose, I recorded Kinga singing and whistling at the same time, and later isolated the partials produced by the whistling. Tristan Murail also showed a particular interest in extended vocal technique, when analysing Mongolian overtone singing to retrieve material for his piece *L'Esprit des dunes* (Hirs, 2009). In order to isolate the partials caused by the whistling, I first identified, by listening and observing the spectrum of the recording, the fundamentals of the sung line and deleted their harmonics in the range between 500Hz and 5000Hz, which is the range of human whistling (Nilsson et al., 2008). Subsequently,

68 See Appendix 4 for the Hungarian and German versions.

I applied a bandpass filter to extract frequencies between 500Hz and 5000Hz. Finally, I used a simple patch I built in OM to extract the rhythm from the resulting audio track (Fig. 6.2).[69]

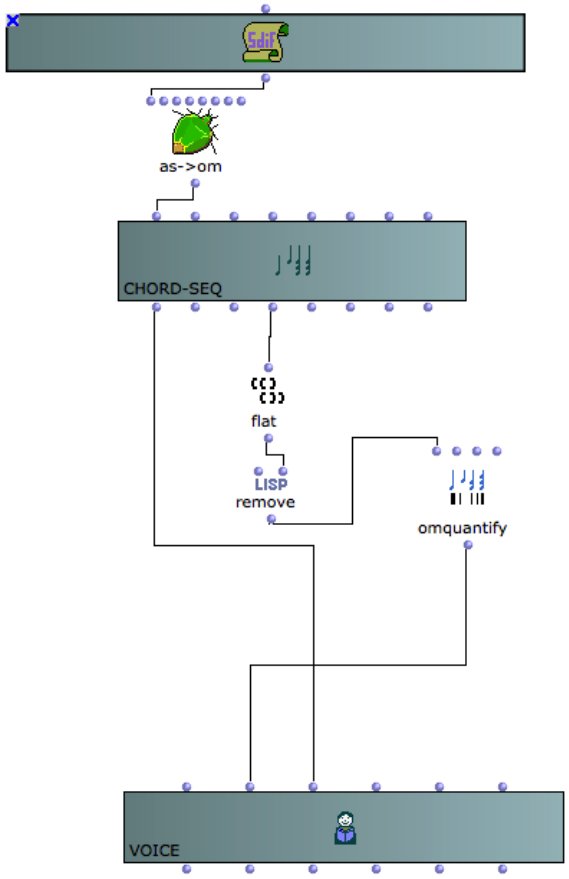

Fig. 6.2 – OM patch used to convert sound analysis data to symbolic musical data

Since the rhythm I obtained was characterised by figures spaced out by quite long held sounds, I decided to extract only the figures, and to produce a rhythmic pattern by concatenating them. The result can be seen below (Fig. 6.3).

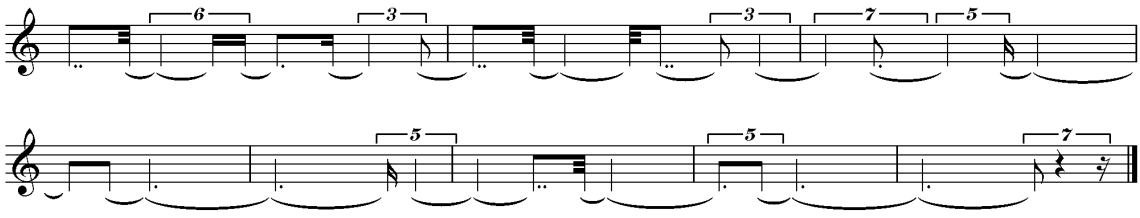

Fig. 6.3 – Rhythmic pattern extracted from the recording

69 OpenMusic (OM) is a Lisp-based visual programming language, developed by the IRCAM Music Representation research group. © 1998-2013 Carlos Agon, Gérard Assayag, Jean Bresson.

To understand how this rhythmic pattern was employed, it is useful to observe bb. 2-3 (see Fig. 6.4).

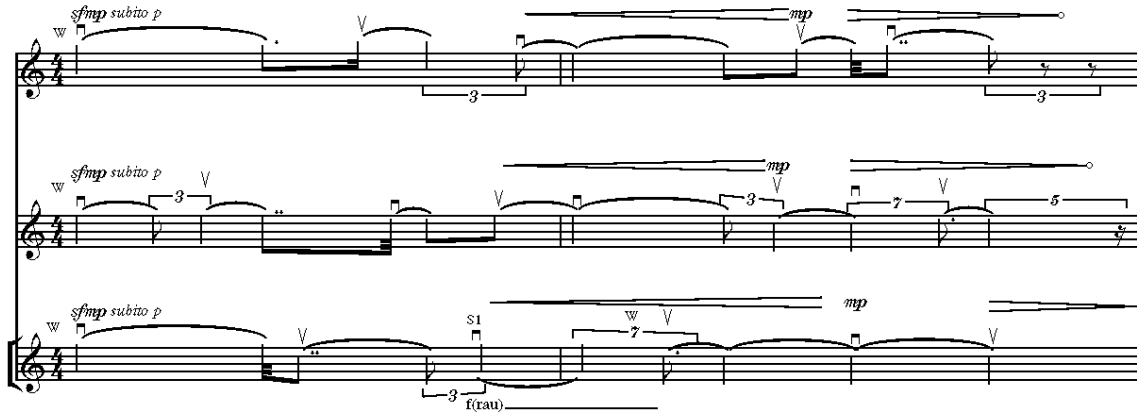

Fig. 6.4 – Bars 2-3 deprived of the noteheads to highlight the rhythmic patterns

The flute line employs the scheme above from the beginning to the end of bar 2, with some slight differences. The first two beats were tied, so that the first note lasts for a minim plus a dotted quaver. The double-dotted quaver after the first triplet was tied to the following demisemiquaver. The crotchet on the second beat of the second bar was subdivided into two quavers. The vocal line employs the same pattern but starts from the third beat of the first bar and, besides keeping the variations introduced by the flute, permutes the crotchet and the quaver in the first triplet. The cello starts using the rhythmic pattern even further in, thus from the second bar, and with its own slight modifications, which mainly aim at prolonging durations rather than diminishing them.

As might have been inferred from the description of the methodology used to organise rhythm in bb. 2-3, the rhythmic pattern in Fig. 6.3 was modified by subdivision of its figures into three progressively more articulated versions, while, by adding ties, a version with longer durations was produced. This kind of procedure had previously been used in *Narciso*, when I needed to generate rhythmic filters, and again bears the trace of Ferneyhough's work on rhythm in his Fourth String Quartet (Fitch, 2009). In *Die Elbe*, though, I sometimes superimposed irrational rhythms on rhythmic cells in order to confer more unity to a musical gesture, whereas in *Narciso* I did not. For instance, in bar 1 of *Die Elbe* it is possible to observe that in the singer's line a triplet

has been superimposed on a modified version of the rhythmic cells of the first two beats of the flute line (see Fig. 6.5). Ferneyhough generates the first bars in the fourth movement of his Fourth String Quartet by applying a 6:5 irrational filter to the first bars of the first movement. Nevertheless, he applies a tempo change from quaver = 50 to 58, while I do not, so that in *Die Elbe* the overlapping of the original rhythmic cell and the filtered one generates the coexistence of different temporal frames, as in Grisey's *L'Icône paradoxale*.

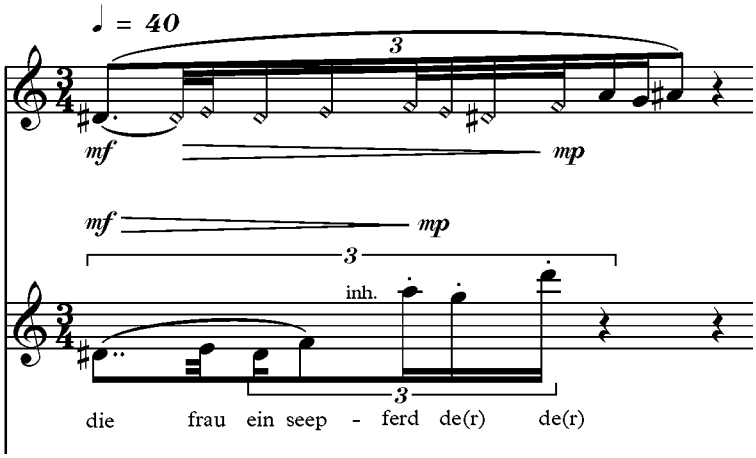

Fig. 6.5 – Flute and voice lines in Die Elbe*, bar 1*

Formally, the piece was conceived as an interpolation of two smaller pieces, which were fragmented and alternated so that one or more fragments belonging to the first piece were always followed by one or more fragments from the second. The rhythmic structure of the first piece is based on the use of the five versions of the rhythmic pattern, from the most articulated to the one with the longest durations, while the second piece moves in the opposite direction. The biggest contrasts in terms of durations can be observed in the first part of the whole composition, where brief, intensely articulated interventions alternate with fairly long, substantially static tones, whistled by the whole ensemble. In terms of text use, the first smaller piece tends to *mend* the syllables which are being distorted by extended techniques such as for example inhaled damping,[70] but mainly maintains a syllabic approach to semantically meaningful textual fragments. The second smaller piece progressively includes sounds

70 See performance instructions.

related to letters such as *-r* or *-f*, or (non-extended) singing techniques, so that a connection to the text in the neighbouring bars slowly builds up.

The pitch material in the piece was produced by coding each letter of the poem with pitches corresponding to the central frequencies of the formants, in the case of vowels, or of major frequency peaks, in the case of consonants. Peterson, Jassem and Parsons (Peterson and Barney, 1952; Jassem, 1962; Parsons, 1987) are the sources on which I relied to retrieve information about formants and peaks, but I also led some analysis myself in order to produce the rest of the information I needed. For example, I used Praat to analyse my voice while uttering the consonant *-d*.[71] I identified four major frequency peaks around 386Hz, 1859Hz, 3007Hz and 3952Hz, after taking into account transients for a tenth of a second.[72] This procedure resembles the one Tenney used to realise the instrumental synthesis in his *Three Indigenous Songs* (1979), in which he took into account formant regions so that more than one pitch per formant could be associated to a letter (Wannamaker, 2008). An example of how pitches, regardless of their octaves, were associated with text in the first bar can be seen in the following image:

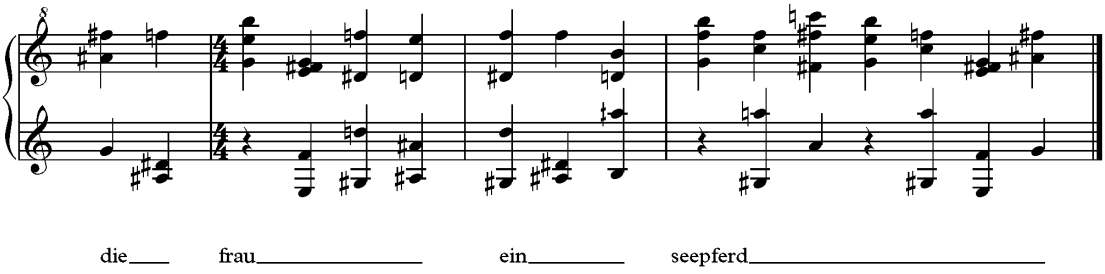

Fig. 6.6 – Pitches associated with the letters of some of the words in the first verse of the poem

Some further connections between text and music were built. There are, in fact, two mimetic correspondences between the melodic lines and the images shaped by the poem. In particular, I refer to the torsion of the woman having *her thighs on her shoulders* (‘die frau ein seepferd der schenkel über ihrer schultern’) and, therefore,

71 Created by Paul Boersma and David Weenink of the Institute of Phonetic Sciences of the University of Amsterdam, Praat is a computer program used to analyse, synthesize and manipulate speech, and to create high-quality pictures.

72 I considered transients so that I would have an interval of frequencies for each peak. This way, my data assumed a form similar to those retrieved from articles or books, in which the measurements of formants and peaks had been done with a sample of people.

being compared to a seahorse, and to the image of a *wave* (‘eine welle’). This torsion is mirrored in the opening movements of the performers’ lines. The singer and the flautist move towards a higher register, while the cellist descends to a lower one. At the beginning of the piece, the melodic line is an ascending one, which contrasts with the sustained whistling that interjects from time to time. From bar 24, the voice starts including also a small compensation, thus a slight descent after the ascent. After a while, the descent becomes predominant in comparison to the ascent, which progressively disappears. Towards the end of the piece, a new element is introduced. A large ascending leap follows the descent, producing the effect of a periodic phenomenon such as a wave.

In addition, vocal techniques such as inhaled damping or the deconstruction of the text in the whistle-fragments are all elements conceived to depict a woman with disabilities which prevent her from properly speaking or having control of her voice. As in *T-O*, varied repetitions of the same rhythmic pattern support the development of textual elements from a pre-linguistic state. The aura of the voice of Elbe – a hyper-voice, as described above – has been shaped by the ensemble using the combination between the model of human whistling and the analysis of text.

7. WORKING WITH A CELLIST: *White Mask* AND *Cera* (2015)

The present chapter illustrates how a collaboration with cellist Esther Saladin and the discovery of material in the British Library Sound Archive gave birth to a cycle for cello and live electronics. Two of the three compositions of the cycle have been included in my portfolio and are discussed in this chapter. The first section of the chapter is dedicated to *White Mask*, a piece for cello solo, in which a sociological mask becomes a filter bank that shapes the repetitions of material extracted by the analysis of textual fragments and paralinguistic elements, and thus encourages the listener to observe a musical object from different perspectives, while the speech-like material and counterpoint suggest the presence of voices. The second section of the chapter illustrates how live electronics can turn a cello into the sound of an mbira player's voice and of his instrument, hence, for once, reversing the process of integration. It is no longer an instrument from a non-European tradition having to penetrate the Western music scene, but an instrument born in the Western music tradition that transforms into a non-European traditional instrument and has to adapt to its performative peculiarities.

7.1 White Mask

for cello solo (2015)

Delving into the sound archive of the British Library led me to the discovery of a conversation on the status of women in post-independence Africa, from which I extracted a fragment that I then analysed to build my composition. It is, though, fundamental to consider for a moment the whole discussion so that the formal choices that affected the compositional process will be clear. The conversation was recorded in 1966 and involves four women with different backgrounds.[73] Only one of them is European and white, and this is probably why at the beginning of the conversation the tension is palpable. Nevertheless, once Ms Macaulay from Sierra Leone starts speaking,

73 Further information and the whole conversation can be found at the following link: http://sounds.bl.uk/Arts-literature-and-performance/African-Writers-Club/024M-C0134X0077XX-0100V0. I would like to underline that all the comments about the conversation which follow in this text are due to the combination of my personal perception of it and some information I found about the women involved. It is, therefore, possible that my perception is entirely subjective and maybe even wrong. I apologise in advance if this is the case. Nevertheless, this could be regarded as a projection of similar situations that actually happened in post-independence Africa.

the atmosphere becomes more friendly. Probably because she too was educated in Europe, Ms Macaulay engages particularly well with Lady Cohen, the British woman, and displays the ability to make her laugh, thus contributing to diffuse the tension. After listening to the recording, I researched about the four women and found out that Lady Cohen was the wife of the last governor of Uganda. This position and the characteristics described above might have contributed to her being perceived by the other three women as a part of the colonialist apparatus. The title of my composition is an allusion to Frantz Fanon's book *Black Skin, White Masks*, and aims to highlight the unstated roles and positions of the women involved in the conversation.

7.1.1 Mask, sound material and methodology of analysis

According to the description on the website of the Pitt Rivers Museum in Oxford,

> Masks fulfil their purposes in diverse situations of life, as means of protection: such as those worn by surgeons, welders or ice-hockey players; in times of war by soldiers; as means of disguise, as worn by burglars, terrorists or participants in a mask-ball; we could even think about make-up as a form of masking. (Pitt Rivers Museum, 2015)

In *Cera*, I regard the mask as a form of ideology or unwitting disguise,[74] which, within the piece, finds its counterpart in an array of bandpass filters (see Fig. 7.1). The first chord in Fig. 7.1 represents the filter bank, and hence the mask, while the other chords in Fig. 7.1 are the pitches which are progressively allowed to pass through the filter, as will be described further in this section. The pitches corresponding to the bands in the filter bank are very clearly some of the harmonics of the fundamental A#1. This structure derives from the analysis of my voice while singing A#3 on the vowel 'o'; the first chord was detected when my hand was in front of my mouth, and all the pitches in the figure when I moved my hand away. I am aware that this system did not provide me with information about the response on a full range of audible frequencies, but to describe in detail the features of a mask was never the purpose of my work. Rather, the procedure identified two sets of pitches, which I used respectively as a filter bank and as a transient to an unfiltered state.

74 I am, in fact, not sure to what extent Lady Cohen was aware of the negative aspects of colonialism.

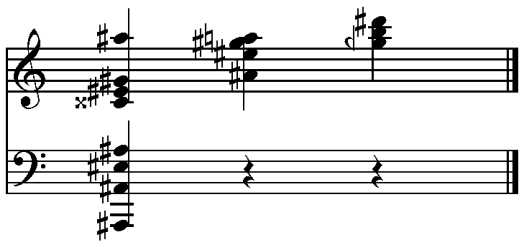

Fig. 7.1 – Filter bank (mask)

Ms Macaulay's ability to release the tension invites Lady Cohen to get rid of the mask, and the perception towards the end of the conversation shifts from coloniser–colonised to a group of women. The image of a mask being removed is mirrored by the progressive widening of the bands in the filter bank. This procedure is applied to each musical fragment derived from the analysis of the text, so that between the situation with no filter and the one with the filter bank two more intermediate steps are built. The operation, however, cannot be formalised, since it does not always involve the same bands of frequencies, due to the different frequency contents in the material. If this had not been the case, a prearranged widening of the bands would have led to intermediate steps with the same frequency content, and would have been of no use. For the same purpose, sometimes the filtering was extended beyond the features of the original filter bank in order to generate steps with significative differences. For example, the word 'countries' was fragmented into the four fragments *kə-ən-tri-iz*. Fig. 7.2 shows, in turn, the analysis corresponding to the first fragment (i.e. the sound *kə-*): the result after applying the filter bank; and the first and second intermediate steps.

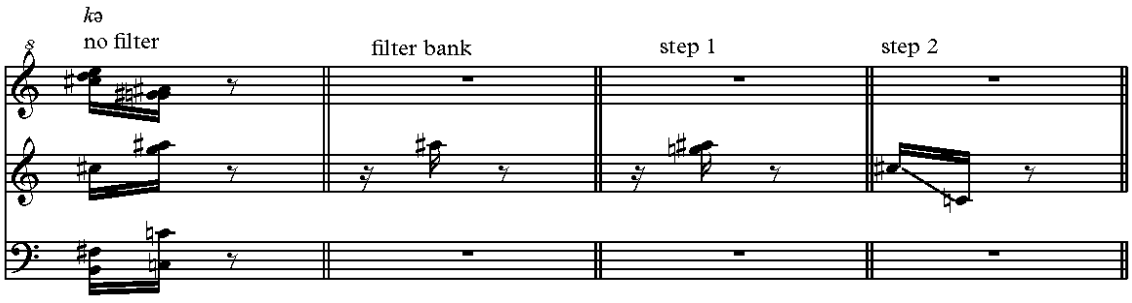

Fig. 7.2 – Musical material corresponding to the fragment kə- *and the result of different stages of filtering*

One can see clearly in Fig. 7.1 that the second step includes pitches which would usually belong to the situation with no filter bank, but which were included to build a

third stage of filtering.

The phrase chosen for the analysis is uttered by Lady Cohen, saying 'In the economics of South African countries …', while Ms Macaulay pronounces the words 'Oh, yeah, humongous'. This part of the recording was further fragmented, identifying the group of words (Fig. 7.3a), single words (Fig. 7.3b), phonemes (Fig. 7.2) or even single letters (Figs 7.4a and b). Subsequently, I applied the chord sequence analysis with AudioSculpt to produce a sdif file, which was used by the same OM patch illustrated in Chapter 6 (Fig. 6.2) to produce a symbolic musical representation of the samples. By adjusting the parameters in AudioSculpt[75] and OM[76], I managed to retrieve more microscopic details of the text the smaller was the fragment of text I was analysing. This methodology enabled me to identify different temporal scales by applying different enlargements to the textual fragments.

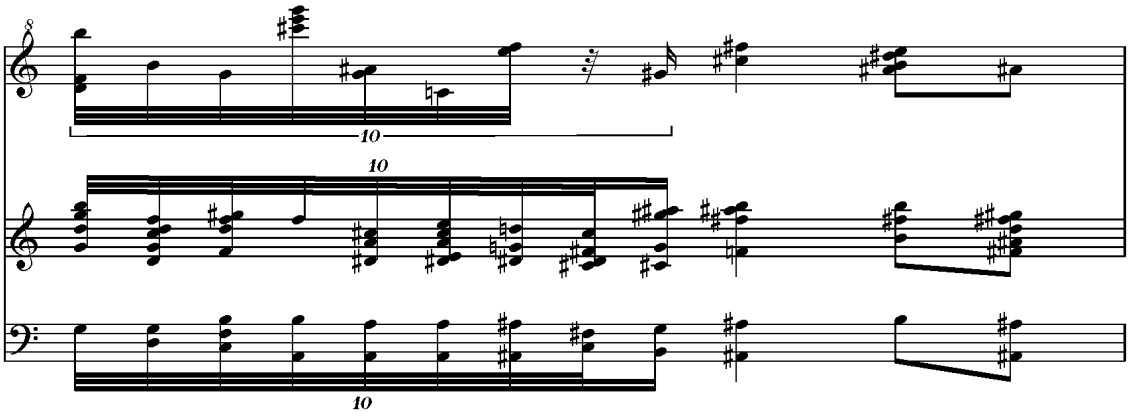

Fig. 7.3a – Musical material retrieved from the analysis of the phrase 'In the economics of South African countries …'

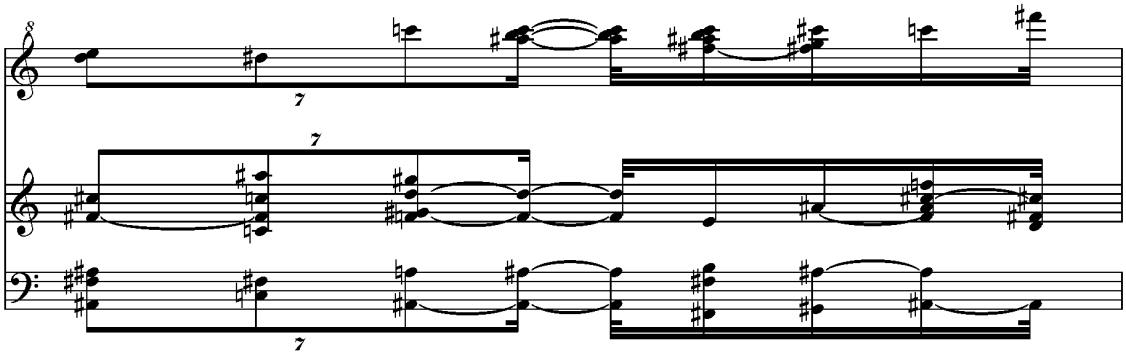

Fig. 7.3b – Musical material retrieved from the analysis of the word 'countries'

75 Markers used in the chord sequence analysis.
76 *Delta* in *AS->OM* block and *tempi* in *OMquantify* block.

Although in *White Mask* I did not superimpose materials with different temporal scales, this procedure is reminiscent of the way in which Gérard Grisey organised three different 'times' in his *L'Icône paradoxale*, thus *temps dilaté*, *temps normal* and *temps contracté*: the first one containing the orchestral synthesis of the sonogram of the syllables in the name 'Piero della Francesca'; the second one hosting the two singers uttering syllables; the third one proposing contracted extracts of the other two time-frames (Baillet, 2000). Furthermore, as mentioned in Chapter 4, the methodology used for the analysis is very similar to the one used by Claudy Malherbe to retrieve data from spoken text for his composition *Locus* (Malherbe, 2008). The main differences between his procedure and mine are that I also analysed fragments of text smaller than syllables, so that I distinguished more than one temporal scale, and that I also added the objects *OMquantify* and *Voice* to transform durations into rhythmic patterns.

The simultaneity of the voices in the recording was used to build some sort of counterpoint. Each time a fragment was analysed, I focused on the voice of a different woman. Sometimes distinguishing the two voices was easy, as for example when one was pronouncing a fricative consonant and the other a vowel, or when their dynamic levels were quite different. At other times I had to use formant filters and to rely on the fact that the two women's voices have quite different timbres. For example, the analyses of the fragment in which Lady Cohen utters the consonant 's' and Ms Macaulay simultaneously emits an 'o' led respectively to the results in Fig. 7.4a and Fig. 7.4b.

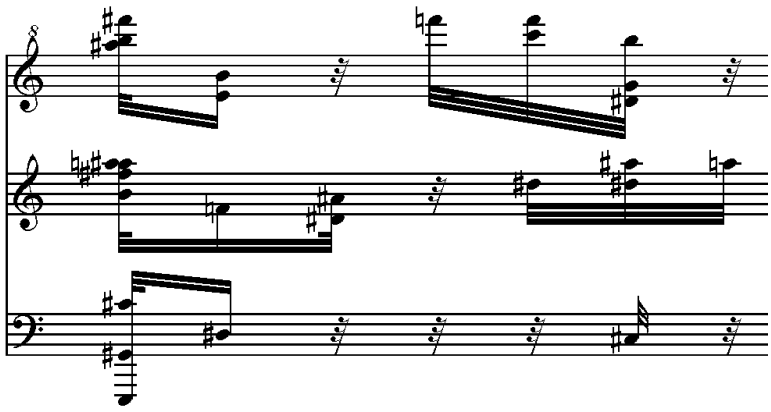

Fig. 7.4a – Musical material retrieved from the analysis of the letter 's' in 'South'

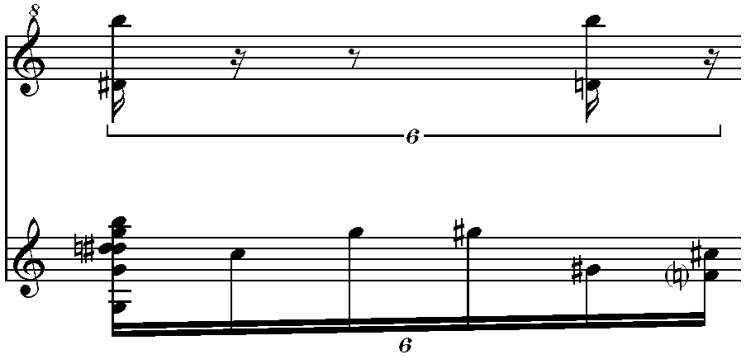

Fig. 7.4b – Musical material retrieved from the analysis of the vowel 'o' in 'Oh'

The superimposition of these materials, once filtered according to the mask, can always be found in the first beat following the double barline, except for the last time. Dynamics, too, highlight the two different voices. Moreover, polyphony is also developed by the desynchronisation of the bowing activity and the left hand.

7.1.2 Formal structure and rhythmic elements in the introduction and coda

From the above considerations, it is possible to infer that the piece is built on varied repetitions of the same material, which presents itself modified through the process of filtering (see Table 7.1). In particular, four repetitions of phonemes and words are characterised by the four levels of filtering, viz.: totally filtered; step 1; step 2; and no filter. These four sections are followed by the first appearance of the material corresponding to the analysis of the whole sentence (see Fig. 7.3a), which is repeated seven times before harmonics of G3 (bar 54) are played by the cello to establish that a transition from the harmonic area of the filter has actually taken place. This choice comes from the first demisemiquaver in Fig. 7.3a and contrasts with the chord on the first beat of bar 42, which clearly recites some of the pitches of the mask, although not always in the original octave. The seven repetitions of the material derived from the whole sentence are varied. Overall, there is a gradual shift from a higher to a lower register. The first three occurrences of this material do not include any of the pitches in Fig. 7.1, while the following four are based on an interpolation between the original material deprived of the pitches from the mask and four versions of the material in which only pitches from Fig. 7.1 are used. The four versions, filtered according to the

filter bank, provides less and less rests in the dectuplet so that the interpolation provides figures with fewer and fewer pitches belonging to the domain outside the bands of the filter bank (see Fig. 7.5).

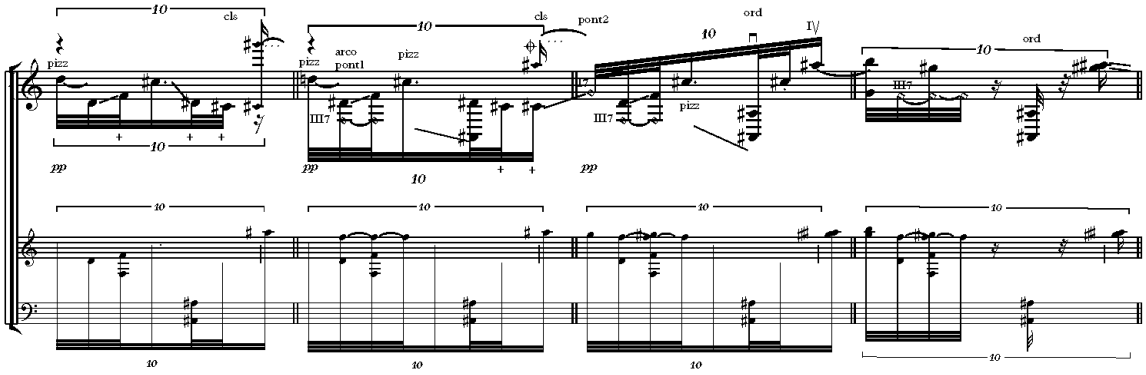

Fig. 7.5 – Four occurrences of the dectuplets before the coda starts and, on the lower staves, the four filters used to design them

The material which was analysed to retrieve pitch and rhythm material is textual but also paralinguistic. In particular, as pointed out earlier, the laughter provoked by Ms Macaulay was analysed and the material retrieved was used to articulate each section of the composition. The five occurrences of this material can be observed in Fig. 7.6, and it is easy to see that, except for the notes played *col legno battuto* ('clb'), a progressive movement towards a lower range is realised.

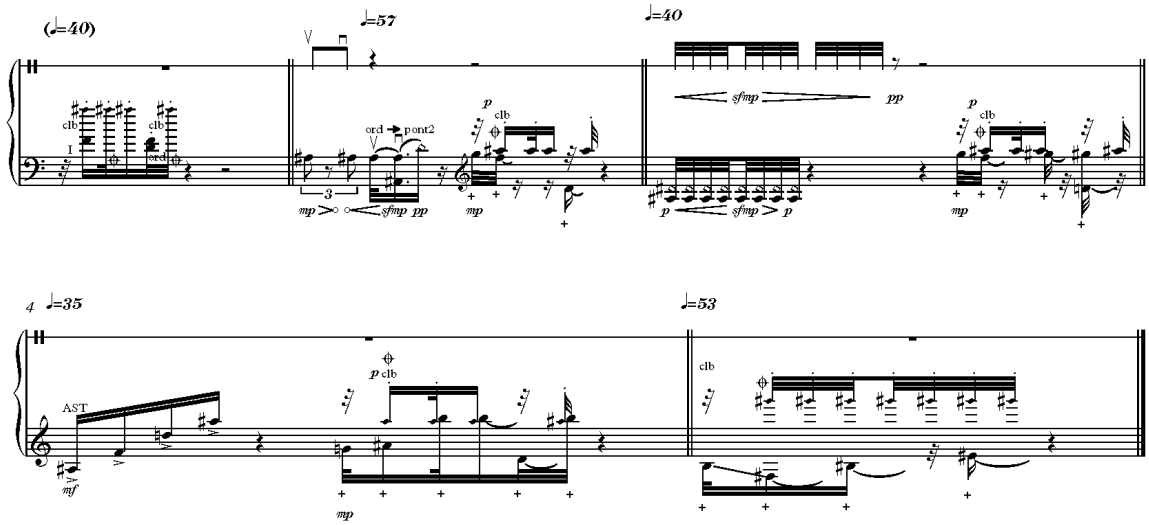

Fig. 7.6 – Occurrences of the musical material based on laughter

This articulation of the formal structure according to varied repetitions of the same sound objects recalls what had already been anticipated in the Introduction, when I reported Lukas Haselböck's words about how Ferneyhough explores his sound objects vertically by differently filtering them each time they occur in a composition, and horizontally by changing their 'time-flow' (Haselböck, 2009; Fitch, 2013: 227). This allows the listener to observe 'multiple perspectives of the same phenomenon' (Fitch, 2013: 227). For example, *Carceri d'invenzione IIa* (1984) is based on repetition: specifically, on permutations of 48 modules, which on each occurrence display pitch material belonging to a narrower range, as if filtering with a progressively smaller band, and with a different temporal compression or expansion (Fitch, 2013; Pätzold, 2002).

Section	**Material**	**Bars**
Introduction	Whole sentence + laughter	1-10
Filter bank (rep1)	Letters and words + laughter	14-20
Step 1 (rep2)	Letters and words + laughter	21-31
Step 2 (rep3)	Letters and words + laughter	33-42
No filter bank (rep4)	Letters and words + laughter	43-48
no filter → filter bank	Whole sentence (7 repetitions)	50-57
Coda	Letter	57-65

Table 7.1 – Formal structure of White Mask *and its relationship to textual and paralinguistic fragments*

In order to generate the rhythm and pitch material of the introduction, the whole sentence was passed through a filter bank built in Pure Data so that the central frequencies f_c would correspond to those of the pitches in the first chord of Fig. 7.1 (the bandwidth of each filter being set to f_c/Q, where Q was 200). The resulting audio signal was subsequently analysed with *AudioSculpt* and, finally, the OM patch in Fig. 6.2 (see Chapter 6) provided the rhythmic pattern which can be observed in the upper staff of the first system of the piece. Four slightly different versions of this rhythmic pattern were developed by tying notes together or subdividing them or distinguishing between the action of the bow on the bouts or on the fourth string.

The structural counterpart to the introduction is the coda of the piece. After the chord based on some of the harmonics of G3, only pitches extracted from Fig. 7.1 are

played until the last four beats, the frequencies of their repetitions being derived from their relationship to the fundamental A#1. The formula below illustrates the procedure:

N. subdivision of a crotchet = frequency / fundamental frequency

For example, whenever I used the third harmonic, its relationship with the fundamental frequency would be 3, and I would assign a triplet. Clearly, the ratio is an integer when one takes into account only harmonics of the fundamental frequency. Nevertheless, the last melodic fragments of the piece, after the fermata, employ the pitch material retrieved from the analysis of the letter 's', and therefore the results to the above formula are not whole numbers. A similar formula is used by Jonathan Harvey in his *Mortuos plango, vivos voco*, with the difference that the ratio provided him with the pulsation speed[77] of the pitches and that he scaled the results with a multiplier factor (Murail, 2005b). The use of frequent shifts from one irrational group to another was used to achieve speech-like qualities in a section in which there is no direct connection to speech. Aperiodicity is employed by Nicolaus A. Huber for the same purpose in his *Vor und Züruck* (Huber, 2008), and Ferneyhough and Tenney have both claimed to sometimes try to achieve speech-likeness in their music (Fitch, 2013; Wannamaker, 2008).

7.2 Cera

for cello and live electronics (2015)

As was mentioned in the introduction to this chapter, *Cera* aims at transforming the sound of a cello into that of a mbira player's voice and his instrument. My title itself comes from the union of the words 'cello' and 'mbira', but also refers to the Italian word *cera* ('wax'), with its associations of malleability. When I talked to Esther about the idea of transforming the sound of her cello into that of an African traditional instrument, she was particularly excited about mbiras. I was concerned because mbiras are not string instruments and thought that it might be difficult to synthesise their sound from that of the cello. Fortunately, its bell-like quality turned to be quite ideal to be

77 This entails a relationship to seconds and, therefore, a specific tempo, while I just refer to the beat in a bar, thus without absolutising the pulsation.

synthesised with the dynamic filters I designed. My final idea, though, after listening to mbira music, was to include the voice of the player and, therefore, textual elements, since the instrument is closely related to storytelling (Berliner, 1978). I have, in fact, a particular interest for capturing the features of a specific individual's voice, which I share with Trevor Wishart, according to his comments in interview with Férdia Stone-Davis (Stone-Davis, 2015). The recording chosen for the analysis was found, once again, in the British Library Sound Archive; it refers to New Xade, a small village in Botswana, in which 'malnourishment […] has caused people's bellies to become big' (British Library, 2015).

7.2.1 Methodology and relationship to the original song

A transcription of the song 'Narihoa', by Kuela Kiema, was made so that an accurate documentation of all musical and textual elements involved was available. It is interesting to stress that Tenney had also included a traditional song among the vocal models used in his *Three Indigenous Songs* and, in particular, had employed his own setting of an Iroquois chant.[78] What emerges from analysing 'Narihoa' is that the song is based on a *basso ostinato* (see Fig. 7.7a), which goes on for the whole piece, while two different melodic fragments are alternated (see Figs 7.7b and c). Both melodic fragments lie on a major chord built on the tonic note.[79] Nevertheless, I distinguish between the two, because one occurs several times with small variations in terms of pitches and text and leads to the introduction of extended vocal techniques, while the other is heavily developed both in terms of melodic shape and textual articulation every time it occurs.

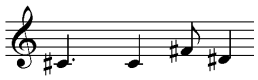

Fig. 7.7a – Basso ostinato *in the song*

78 The chant's title, as translated by Jerome Rothenberg, is 'Hey when I sing these 4 songs Hey look what happens', and the setting, realised in 1971, was for soprano, alto, tenor and bass voice(s) (Wannamaker, 2008).

79 I called it tonic for clarity, but, since the seventh scale degree never occurs, it is not possible to infer whether the harmonic field is a major scale or a mode.

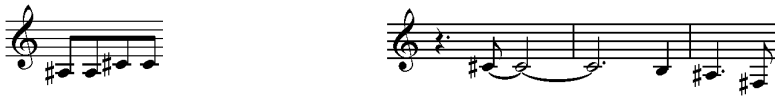

Fig. 7.7b & Fig. 7.7c – Melodic fragments of the voice in the song

It is quite apparent to me that these two melodic fragments are being alternated and varied quite freely in the course of Kiema's performance, and this why a certain degree of freedom is maintained also in *Cera*. The cellist can, in fact, choose to repeat some elements thanks to the use of a MIDI mouse, which allows her to control the main cue list in the Pure Data patch I developed (see main patch in Fig. 7.8).

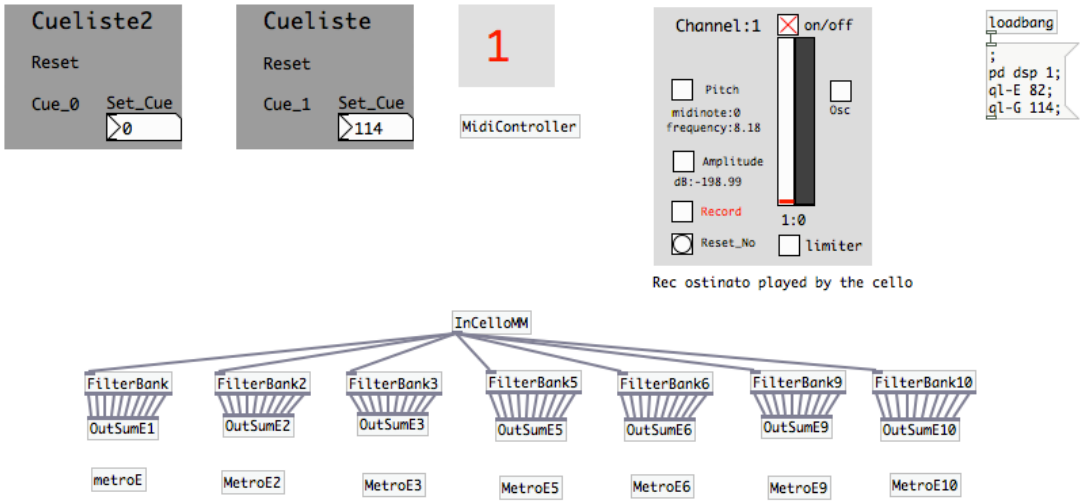

Fig. 7.8 – Main patch

The piece is structured in two sections. The first one is characterised by twelve fragments that the performer can choose to play in any order along with the ostinato and a fragment of the recorded ostinato, which the cellist can activate via the MIDI controller. In the second section, the cellist plays only the ostinato and activates the output from the live electronics, which feeds on the ostinato to synthesise a simplified version of fragments of the original recording.[80] I will describe below the methodology

80 In order to avoid feedback-related issues, I decided to feed the dynamics filters with the ostinato played by the cello live, but not at the very moment the filters are activated. From the indications in the score, it is possible to observe that the cellist needs to record the ostinato at the beginning of the second part, before activating the output in this section.

used to produce the written fragments of the first section and the live-electronics elements of the second section. Parts of the recording were extracted and their sonograms simplified by deleting partials so that, in case they belonged to the first section of the piece, the only partials left would fit into the prearranged frequency ranges (see Table 7.2), while, in case they belonged to the second section of the piece, they would still be able to resemble the original sound.[81] In the latter situation, the selection was led by deleting the partials below a certain amplitude threshold. From Table 7.2, it is possible to infer that the first section was built so that the range gradually moves from higher to lower frequencies, and then quite quickly returns to high ones. Nevertheless, since the performer can choose the order of the fragments, this structure is not necessarily reflected in the outcome of the performance.

	Cello interventions in section 1												
(Hz)	1	2	3	4	5	6	7	bridge	8	9	10	11	12
1500-3000	X											X	
1000-1500		X	X					X			X		
600-1000			X	X	X			X			X		X
400-600	X			X		X	X	X	X	X	X	X	X
300-400					X	X			X	X	X	X	X
230-300							X		X	X	X	X	X
Below 230Hz												X	

Table 7.2 – Filtering of the partials analysed to retrieve the material of the first section

With regard to the fragments of the first section, once the partials belonging to that specific range have been identified, a chord sequence analysis was undertaken using AudioSculpt, from the result of which the OM patch illustrated in Chapter 6 (Fig. 6.2) extracted rhythm and pitch information. The vowels involved in each fragment determined the formant filters, which were manually applied to the whole fragment.[82] Hence, each formant filter determining a different series of musical figures, thus a different layer of the original material. Eventually, when possible, I shaped the cello's melodic lines by imitating the textual elements in the fragment, so that the final results would be a line moving from one layer to another. Sometimes, though, in the frequency ranges selected a priori, the formant filters did not provide any results for some vowels.

81 Also, the number of partials would have to be 10, since that is the number of filters with which the bank has been provided.

82 For the central frequencies of the formant filters this time I referred to those indicated by AudioSculpt.

In these cases, I just chose freely from the material corresponding to other vowels. An example of how I built the fragment in Fig. 7.9a can help better illustrate the procedure.

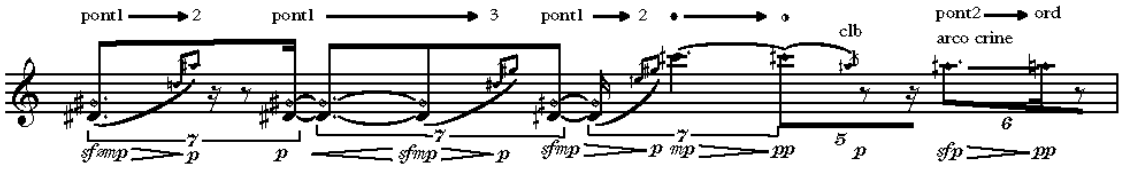

Fig. 7.9a – Third fragment in the first section

In this fragment, the vowels involved are 'a', 'e', 'o' and 'u',[83] and, from the data provided by AudioSculpt, the formant filters that affect frequencies between 600Hz and 1500Hz are as follows:

Vowel	Bandwidth of formant filters	Corresponding pitches[84]
a	1120Hz ± 45Hz	C6 - D6
e		
o	800Hz ± 40Hz	F#5 - G#5
u	600Hz ± 30Hz	C#5 - D#5

Table 7.3 – Formant filters and corresponding pitch ranges selected from one of the fragments

Once the pitches retrieved by the analysis (see Fig. 7.9b) have been filtered according to the formants in those bands,[85] the three layers obtained are as shown in Fig. 7.9c.

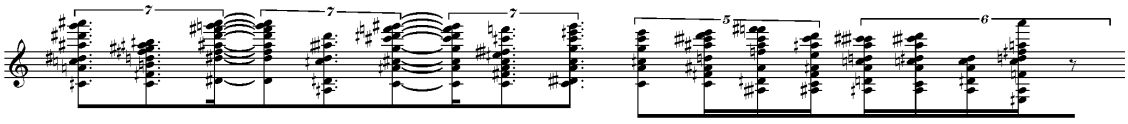

Fig. 7.9b – Data retrieved from the analysis and extracted with OM

83 Since I used data provided by AudioSculpt, I decided to adopt the kinds of vowels included in its tools.
84 Approximated to the nearest semitone.
85 A small expansion of the bands was applied to make possible the inclusion of some more pitches.

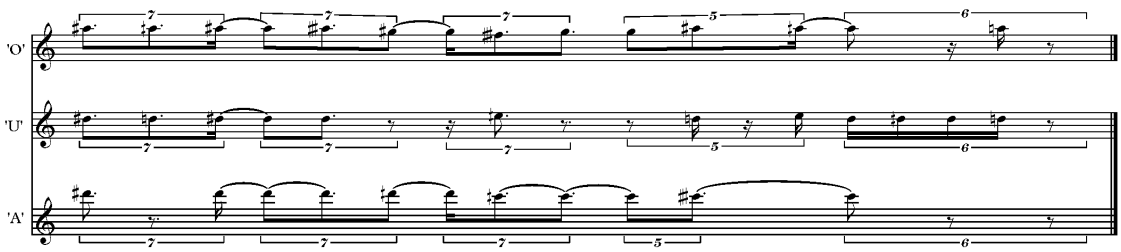

Fig. 7.9c – Data retrieved from analysis, after filtering according to the formants of three vowels

When synthesising what appears in Fig. 7.9a, I decided that the layer corresponding to the vowel 'a' should prevail, while the 'jumps' to the other two layers would quite freely imitate the alternation of vowels in the recording and be notated as embellishments. This decision was made so that a certain amount of the fragments of the first section were characterised by sustained sounds and brief excursuses to other pitches, which were regarded as 'perforations' of the prevailing layers. This kind of multiple filtering procedure, partially due to the elements in the text, reminds me of the Deleuzian concept of a rhizome, which I mentioned in the Introduction. A rhizomatic structure allows the intersection of text and music via the engraving produced by the rhythm and pitch material retrieved from the text involved, while the multiple filtering explores the depth of such intersections. The choice of employing the analysis of a text uttered while singing by a specific individual narrows the intersection but opens up connections with other plans, such as aural tradition and improvisation, hence multiplicities of connections. The small 'perforations' between the layers of pitches corresponding to vowels are not the only ones in the piece. The interventions of the cellist, separated by silence, open a window on the original recording by reproducing shards of it. These fragments are never exact copies but rather transfigurations of the original material, because of filtering or time stretch, but can be compared to the instants in which Mozart's Clarinet Concerto surfaces from the orchestra in Lachenmann's *Accanto*, to the anamorphic dislocation of the material of 'Stardust' in Sciarrino's *Vanitas*, or to the quotations of Christopher Tye's works in some of Ferneyhough's chamber music (Lachenmann, 2004; Angius, 2007; Fitch, 2013).

The fragments in the first section have one further connection with text, through the influence it has on playing techniques. I associated the filterings induced by the use

of different playing techniques with those entailed by the given text fragment. This idea occurred to me after I read Wishart's writings on phonemic objects, in which he pointed out the possibility of cataloguing them according to their morphology and of project paralinguistic meanings onto them (Wishart, 1996). In fact, perhaps under the influence of the gloss about malnourishment (British Library, 2015) quoted in the introduction to section 7.2 above, I interpreted the repetitive alternations of vowels and nasal and guttural consonants and the slowly descending melodies improvised by the singer as metaphors for chewing and the descent of food from the mouth to the stomach. Since these gestures clearly had a strong meaning for Kuela Kiema, I decided to imprint them into the piece by mimicking the filterings due to the textual content with variations of the pressure of the left hand on the strings. This technique determines different degrees of richness in overtone content and their loudness compared to the stopped pitch (Fallowfield, 2009). An example can be found in Fig. 7.10, in which white diamond noteheads represent harmonics and black diamond noteheads indicate half-pressure in the left hand.

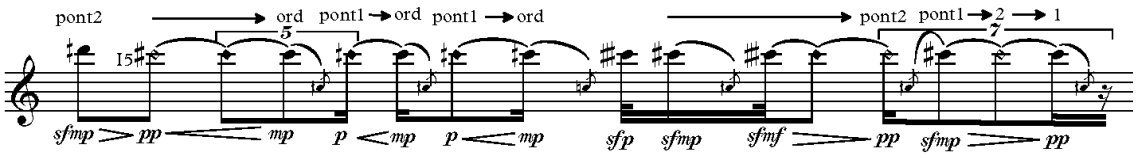

Fig. 7.10 – Second fragment in the first section

The second section of the piece was built on the ostinato, this time played by the cello, which the performer records at the beginning of the section with the second block from the right in Fig. 7.8 and which is used by the filter banks – Filterbank – to resynthesise ten fragments of the recording. Since some of these fragments are very similar, I only used seven filter banks and designed the live electronics so that the performer can use them more than once through the use of a midi mouse, which dialogues with the patch via the block MidiController. The mbira and cello ostinato recordings are managed by the block InCelloMM, which feeds the filterbanks, while the outputs of the filterbanks are managed by the blocks OutSumE. The volumes of the filters vary in time, controlled by a secondary cue list - Cuelist2 – and staggered in time by the blocks MetroE, while the central frequencies were ultimately kept constant, since

the partials chosen had very slight frequency variations. A diagram of the filter bank can be observed below.

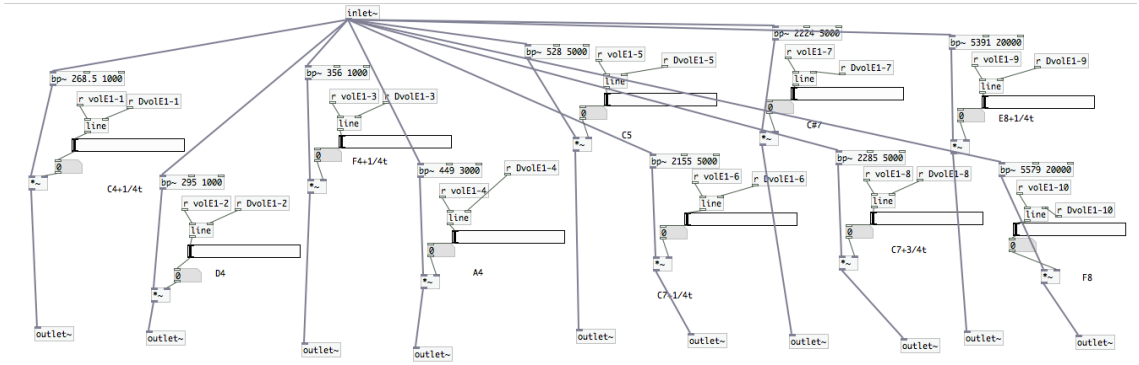

Fig. 7.11 – Filter bank

The partials of the fragments selected for the analysis were identified after simplifying the sonogram by deleting those under a specific threshold. Nevertheless, a progressive exclusion of partials in the lowest ranges was carried out, so that the material produced by the live electronics becomes fainter and fainter.[86] In order to determine the best bandwidth of the filters, I proceeded in an empirical way by first simply filtering the ostinato with a steady central frequency and volume for each bank. This treatment of the ostinato already gave good results in terms of synthesis of the mbira timbre, even without taking into account the envelope of the sound. Nevertheless, I eventually chose to vary the volume levels according to the data derived from the partials, because the result better articulated the elements related to the voice and the 'noisiness' of the instrument due to the rattle of the caps bound to its body, which is traditionally a strongly appreciated aspect of the timbre. In this way, I feel that the aura of Kuela Kiema's voice and of his instrument are properly evoked.

86 This is chiefly due to the fact that the loudest partials are mainly in the lowest frequency ranges of the sonograms.

8. CONCLUSION

The portfolio which has been the subject of this commentary shows how it is possible to strengthen the relationship between text and music, when a synthetic relationship is established via the analysis of human and animal vocal utterances and the use of instrumental additive synthesis. The use of sound analysis software enables such a tight synthesis of the two media that the audience perceives subgroups of the whole information included in the sound of the voice of a specific being, thus conferring uniqueness to the listening experience. In addition, this approach projects the material on a social plane, via an association with the specific socio-political reality suggested by the text itself and, in some cases, via the identity of the person whose voice is analysed. The choice of a model based on vocal utterances entails the inclusion of an *aura*, the simultaneous presence/absence of the person, whose voice – once synthesised by another instrument – appears disembodied. The rhizomatic structure hidden behind this conceptualisation of the synthesis between text and music surfaces clearly in the role given in my music to window forms, and, with them, to temporal scales and frames. The model becomes the node of the rhizome and connects one or more plateaux every time it is repeated within a window in a composition, thus creating a complex system of intersections between text, voice, social context and perception.

The use of pre-existing compositions in my work is never representational, but rather engages the audience's perception and memory, whether only a rhythmic pattern emerges or its formal structure or pivotal pitches, as with the cases of Corelli's Concerto Grosso in *Omertà II* or the echo structure of Gabrieli's motet in *T-O*. With small frames and a high level of enlargement, a new composition can be built on a pre-existing one, as in the case of *Omertà II* – as if one could peer through small holes in a plane and see fragments of *Omertà I*. In this sense, there is no break in continuity with the music of the past, and material connected to a specific tradition can be successfully re-contextualised in a new work. In *Controller* and *Cera*, the use of windows suits perfectly the inclusion of improvisation-based blocks, and, in the latter work, these elements are used to reinforce the connection to the oral tradition of mbira. Moreover, the choice of model, built on fragments of an African song, indicates that the method is very promising for the purpose of embedding music belonging to non-Western cultures and the sound of instruments foreign to the Western tradition.

The use of repetition supports listeners in their process of synthesis of the whole sonorous object, which appears only partially, or projected on the plateaux of different time-scales. The echoes in *T-O* are projections of the same object on a plane in which no consonants are allowed, or one in which melodic intervals get compressed. The proximity and similarity of the varied repetitions of an object become more and more relevant in the portfolio and this favours the memorisation of the object and maybe even the recognition of the source that generated the model to which the repetitions refer for both the performer and the listener. In *White Mask*, the frames include more than one temporal plane – thus more than one enlargement – and through the holes one can view material extrapolated from a single letter or an entire sentence of the original text. My intention to further investigate perception also leads to a change in the methodology used to analyse the spoken or sung text. Instead of retrieving the fundamental frequencies and their harmonics, as I did at the beginning of my portfolio, I later chose to use chord-sequence analysis so that the information I obtained was more connected to perception. This also fulfils my interest in exploring the threshold of intelligibility, and provides an excellent ground for a future inclusion of a philosophical frame related to Deleuze's concepts of difference and repetition and Henri Bergson's concept of memory.

Within the portfolio, the focus of my analysis of vocal utterances shifts from pure text, sung or spoken, to sounds which are characteristic within the context generated by a specific text. Certainly, this shift can be ascribed to the influence that the collaboration with a sound poet had on me. I moved from the sound domain towards the word domain and Kinga proceeded in the opposite direction, and we met halfway in our research into a synthetic relationship of text and music. The existence of a form in the text or of special treatments such as speech figures imply musical material for me: material which, through the use of technology, can mirror microscopic features of the text included in the project, as when in *Narciso* a melodic line is shaped according to the formant filters of the vowels contained in the word corresponding to that particular musical figure. Nevertheless, in *Die Elbe*, musical figures are shaped not only by the text, but also by information retrieved from the analysis of the whistling which is a key feature in the context of the chosen poem. Similarly, *Cera* draws on the way in which mbira and voice have been moulded together through centuries of synthesis between performer and instrument, and the analysis focuses on those sounds which better stress this relationship. Therefore, towards the end of the portfolio, the centre of attention is on

extended vocal techniques in relation to specific textual elements.

Drawing on the observations illustrated above and highlighting one further trend within my portfolio, it is possible to identify a potential exploratory path for my research besides the investigation of perception and extended vocal techniques. The choice of the *aura* to be evoked, linked to the identity of the being who produces the utterances on which my compositions are built, shifts from people somehow involved in the poietic process or in the performance of a work to animals or individuals in a specific socio-cultural environment. This tendency arises from my growing interest in highlighting, through the analysis of their voices, social differences among individuals with divergent backgrounds or provenances, such as different inflections, or for detecting the traces that trauma engraves in the voice of human and non-human animals. My future works will, therefore, delve into specific socio-political issues through immersive collaborations with refugees and communities, and through the investigation of new means of production and non-traditional performance spaces.

BIBLIOGRAPHY

Agamben, G. (2004). *The Open*. Stanford: Stanford University Press.

Angius, M. (2007). *Come avvicinare il silenzio: la musica di Salvatore Sciarrino*. Roma: RAI Radiotelevisione Italiana.

Anhalt, I. (1984). *Alternative Voices: essays on contemporary vocal and choral composition*. Toronto: University of Toronto Press.

Arnold, D. et al. (2014). 'Cori spezzati', *Grove Music Online*. Available at www.oxfordmusiconline.com/subscriber/article/grove/music/06486 (accessed on 18 September 2015).

Attinello, P. (2007). 'Dialectics of Serialism: Abstraction and Deconstruction in Schnebel's *für stimmen (... missa est)*', *Contemporary Music Review*, 26/1, pp. 39-52.

Baillet, J. (2000). *Gérard Grisey: Fondaments d'une écriture*. Paris: L'Harmattan.

Benjamin, W. (2008). Translated by J. A. Underwood. *The Work of Art in the Age of Mechanical Reproduction*. London: Penguin Books.

Berliner, P. F. (1978). *The Soul of Mbira: Music and Traditions of the Shona People of Zimbabwe*. Berkeley: University of California Press.

Bossis, B. (2004). '*Les Chants de l'amour* de Gérard Grisey: Entre le rigueur formelle et jubilation humaniste', in Cohen-Levinas, D. (ed.), *Le Temps de l'écoute: Gérard Grisey, ou la beauté des ombres sonores*. Paris: L'Harmattan, pp. 229-266.

Bresson, J., Agon, C. and Assayag, G. (2006). *The OM Composer's Book*. Vol. 2. Paris: Delatour.

British Library (2015). 'Giraffe Dance Group. Mbira lamellophone song. Session 2 of 3. Narihoa'. Available at http://sounds.bl.uk/World-and-traditional-music/John-Brearley-Botswana/025M-C0065X0050XX-1300V0# (accessed on 26 November 2015).

Buchmann, B. (2010). *The Techniques of Accordion Playing*. Kassel: Bärenreiter.

Burgaretta, S. (1989). '"Cuntu" e contastorie nella Sicilia di oggi', *La Ricerca Folklorica*, 19, pp. 121-125.

Calvino, I. (1993). *Fiabe italiane*. Torino: Einaudi.

Calvino, I. (1980). Translated by G. Martin. *Italian Folktales*. New York: Harcourt Brace Jovanovich.

Cerha, F. (2011). 'Work Introduction'. Available at www.universaledition.com/Fuer-Marino-Gestoerte-Meditation-for-piano-Friedrich-Cerha/composers-and-works/composer/130/work/13789 (accessed on 27 August 2013).

Daubresse, E. and Assayag, G. (2000). 'Technology and creation – the creative revolution', *Contemporary Music Review*, 19/2, pp. 61-80.

Deleuze, G. and Guattari, F. (1987). Translated by B. Massumi. *A Thousand Plateaus: Capitalism and Schizophrenia.* Minneapolis: University of Minnesota Press.

Derrida, J. (1973). Translated by D. B. Allison. *Speech and Phenomena: and other essays on Husserl's theory of signs*. Evanston: Northwestern University Press.

Dudeque, N. (2005). *Music Theory and Analysis in the Writings of Arnold Schoenberg (1874–1951)*. Aldershot: Ashgate.

Fallowfield, E. (2009). 'Cello Map: a handbook of cello technique for performers and composers', PhD thesis, University of Birmingham.

Ferneyhough, B. (1995). *Collected Writings*. Amsterdam: Harwood Academic Publishers.

Fineberg, J. (2000). 'Guide to the Basic Concepts and Techniques of Spectral Music', *Contemporary Music Review*, 19/2, pp. 81-110.

Fitch, L. (2013). *Brian Ferneyhough*. Bristol: Intellect.

Freeman, R. and Scelsi, G. (1991). 'Tanmatras: The Life and Work of Giacinto Scelsi', *Tempo*, 176 (March), pp. 8-18.

Gee, E. (2013). 'The Notation and Use of the Voice in Non-semantic Contexts', in Utz,

C. and Lau, F. (eds.), *Vocal Music and Contemporary Identities*. London: Routledge, pp. 175-199.

Grisey, G. (2000). 'Did you say spectral?', *Contemporary Music Review*, 19/3, pp. 1-3.

Haselböck, L. (2009). *Gérard Grisey: Unhörbares hörbar machen*. Freiburg im Breisgau: Rombach Verlag.

Heathcote, A. (2003). 'Liberating Sounds: Philosophical perspectives on the music and writings of Helmut Lachenmann', MA thesis: Durham University.

Hiekel, J. P. (2013). 'Escaped from Paradise?', in Utz, C. and Lau, F. (eds.), *Vocal Music and Contemporary Identities*. London: Routledge, pp. 158-174.

Hirs, R. and Gilmore, B. (2009a). *Contemporary Compositional Techniques and OpenMusic*. Paris: Delatour.

Hirs, R. (2009b). 'On Tristan Murail's *Le Lac*', in Hirs, R. and Gilmore, B. (eds.), *Contemporary Compositional Techniques and OpenMusic*. Paris: Delatour, pp. 46-85.

Hirs, R. (2009c). 'Frequency-based compositional techniques in the music of Tristan Murail', in Hirs, R. and Gilmore, B. (eds.), *Contemporary Compositional Techniques and OpenMusic*. Paris: Delatour, pp. 93-196.

Hockings, E. (1995). 'Helmut Lachenmann's Concept of Rejection', *Tempo*, 193 (July), pp. 4-10 and pp. 12-14.

Huber, N. A. (2008). 'Translation of Huber's Essay "Konzeptionelle Rhythmus-komposition" on Conceptional Rhythm Composition', *Contemporary Music Review*, 27/6, pp. 569-577.

IRCAM (2015). 'Sonogram'. Available at http://support.ircam.fr/docs/AudioSculpt/3.0/co/Sonogram%20Introduction.html (accessed on 15 July 2015).

Jassem, W. (1962). 'The formant patterns of fricative consonants', *STL-QPSR*, 3/3, pp. 6-21.

Lachenmann, H. (2004). *Musik als existentielle Erfahrung.* Wiesbaden: Breitkopf und

Härtel.

Leroux, P. (2008). 'The Model of the Model in *VOI(REX)*', in Bresson, J., Agon, C. and Assayag, G. (eds.), *The OM Composer's Book*. Vol. 2. Paris: Delatour, pp. 149-164.

Levine, C. and Mitropoulos-Bott, C. (2002). *The Techniques of Flute Playing*. Kassel: Bärenreiter.

Malherbe, C. (2008). 'Locus: rien n'aura eu lieu que le lieu', in Bresson, J., Agon, C. and Assayag, G. (eds.), *The OM Composer's Book*. Vol. 2. Paris: Delatour, pp. 179-191.

Malt, M. (2008). 'Some Considerations on Brian Ferneyhough's Musical Language through his Use of CAC – Part 1: Time and Rhythmic Structures', in Bresson, J., Agon, C. and Assayag, G. (eds.), *The OM Composer's Book*. Vol. 2. Paris: Delatour, pp. 7-19.

Mann, A. et al. (2015). 'Canon', *Grove Music Online*. Available at www.oxfordmusiconline.com/subscriber/article/grove/music/04741 (accessed on 18 September 2015).

Matvejevic, P. (1999). Translated by M. H. Heim. *Mediterranean: a cultural landscape*. Berkeley: University of California Press.

Merriam-Webster (2015). 'Antithesis'. Available at www.merriam-webster.com/dictionary/antithesis (accessed on 10 June 2015).

Merriam-Webster (2015). 'Alliteration'. Available at www.merriam-webster.com/dictionary/alliteration (accessed on 10 June 2015).

Mohammad, I. (2004). 'What Has Lachenmann Done With My Mozart?! A Note On Whatever Is Recorded On The Tape In *Accanto*', *Contemporary Music Review*, 23/3–4, pp. 145-147.

Moscovich, V. (1997). 'French Spectral Music: An Introduction', *Tempo*, 200 (April), pp. 21-27.

Murail, T. (2005a). 'The Revolution of Complex Sounds', *Contemporary Music Review*, 24/2–3, pp. 121-135.

Murail, T. (2005b). 'Villeneuve-lès-Avignon Conferences, Centre Acanthes, 9–11 and

13 July 1992', *Contemporary Music Review*, 24/2–3, pp. 187-267.

Nilsson, M., Bartunek, J. S., Nordberg, J. and Claesson, I. (2008). 'Human Whistle Detection and Frequency Estimation', in *CISP '08: Proceedings of the 2008 Congress on Image and Signal Processing, 27-30 May 2008, Sanya, China*. Vol. 5, pp. 737-741.

Nouno, G., Cont, A., Carpentier, G. and Harvey, J. (2009). 'Making an orchestra speak', *Sound and Music Computing Conference,* 23-25 July 2009, Porto, Portugal. Available at: <hal-00839067>.

Paddison, M. (2010). 'Music and Social Relations: Towards a Theory of Mediation', in Paddison, M. and Deliège, I. (eds.), *Contemporary Music: Theoretical and Philosophical Perspectives*. Farnham: Ashgate, pp. 259-276.

Parsons, T. W. (1987). *Voice and Speech Processing*. New York: McGraw-Hill.

Pasolini, P. P. (2014). Translated by S. Sartarelli. *The Selected Poetry of Pier Paolo Pasolini: a bilingual edition*. Chicago: University of Chicago Press.

Pätzold, C. (2002). '*Carceri d'Invenzione* von Brian Ferneyhough: Kompositionstechnische und höranalytische Aspekte', PhD thesis, University of Freiburg.

Peterson, G. E. and Barney, H. L. (1952). 'Control Methods Used in a Study of the Vowels', *The Journal of the Acoustical Society of America*, 24/2, pp. 175-184.

Piston, W. (1978), rev. and expanded by Mark DeVoto. *Harmony*. London: Gollancz.

Pitt Rivers Museum (2015). 'Masks at the Pitt Rivers Museum'. Available at www.prm.ox.ac.uk/masks.html (accessed on 15 November 2015).

Ramazzotti, M. (2007). *Luigi Nono.* Palermo: L'Epos.

Robinson, R. (2007). *Narratives of the European Borders*. Basingstoke: Palgrave Macmillan.

Rose, F. (1996). 'Introduction to the Pitch Organization of French Spectral Music', *Perspectives of New Music*, 34/2, pp. 6-39.

Schaeffer, P. (2004). ‘Acousmatics’, in Cox, C. and Warner, D. (eds.), *Audio Culture: Readings in modern music*. New York: Continuum, pp. 76-81.

Sciarrino, S. (1998). *Le figure della musica da Beethoven ad oggi.* Milano: Casa Ricordi.

Shenton, A. (2008). *Olivier Messiaen’s System of Signs: Notes towards understanding his music*. Aldershot: Ashgate.

Siciliano, E. (2005). *Vita di Pasolini*. Firenze: Mondadori.

Stacey, P. F. (1989). *Contemporary tendencies in the relationship of music and text with special reference to ‘Pli selon pli’ (Boulez) and ‘Laborintus II’ (Berio)*. London: Garland Publishing.

Stockhausen, K. (1964). ‘Music and Speech’, *Die Reihe*, 6, pp. 40-64.

Stone-Davis, F. (2015). ‘Vocalising Home: An Interview with Trevor Wishart’, *Contemporary Music Review*, 34/1, pp. 5-21.

Stuparich, G. (1979). *Un anno di scuola e Ricordi istriani*. Torino: Einaudi.

Tenney, J. (1988). *Meta-Hodos and Meta Meta-Hodos: a phenomenology of 20th-century musical materials and an approach to the study of form*. Oakland: Frog Peak Music.

Tomizza, F. (1992). *Destino di frontiera: dialogo con Riccardo Ferrante*. Genova: Marietti.

Tóth, K. (2014a). *ALL MACHINE*. Budapest: Magvető Kiadó.

Tóth, K. (2014b). *ALLMASCHINE*. Stuttgart: Solitude.

Veer, G. van der (1998). *Counselling and Therapy with Refugees and Victims of Trauma*. Chichester: Wiley.

Wannamaker, R. A. (2008). ‘The Spectral Music of James Tenney’, *Contemporary Music Review*, 27/1, pp. 91-130.

Wishart, T. (1989). ‘The function of text in the *VOX* cycle’, *Contemporary Music*

Review, 5/1, pp. 189-197.

Wishart, T. (1996). *On Sonic Art*. London: Routledge.

APPENDICES

Appendix 1

Re pipi fatto a mano senza penna e calamaro	O King Pepper, made by hand,
sei mesi a setacciarti	But pen to paper put I not;
sei mesi ad impastarti	Six months to refine thee,
sei mesi per spastarti	Six months to fashion thee,
sei mesi per rifarti	Six months to undo thee,
sei mesi alla nicchiola e ti viene la parola	Six months to redo thee,
	Six months in the niche,
	And thou shall speak our speech!

English translation by George Martin in Italian Folktales *(Calvino, 1980)*

Appendix 2

Narcissus Dancing

I am black with love
neither boy nor nightingale
intact as a flower
I yearn without desire.

I arose amid violets
at the day's first light,
sang a song forgotten
in the unchanging night.
I said to myself: 'Narcissus!'
and a spirit with my face
darkened the grass
with the glow of his curls.

English translation of 'Dansa di
Narcìs' by Stephen Sartarelli
(from Pasolini, 2014)

Dulà ch'a è la me patria	***Dansa di Narcis*, *Agreste n.3* and *Li Letanis***	**Expressive indication**	**Vocal technique**	**Theatrical action**
La gnoransa	Als, als, als A sgrisulin, a uitin, a piulin	*Sognando*	Murmuring the text	Walking quietly up and down the stage.
La pasiensa		Biting/Hoarse	Sprech-gesang	
Li passions				
Bestemis	Sensa sen soj	*Furioso*/Angry/ Dismayed		Arm stretched and gaze directed towards a person a long way off. As shouting at him/her.
Ombrena di pensadis rudis	Sclariva, vualiva, scuriva	*Mesto*/With resignation		
La patria a è par me na seit sierada ta un sen arsit dal sec	Narcis, vis, ris/violis	*Flebile*/as if having the throat dry and burned. Uttering words is painful and tiring.	Inhaling	The singer should touch the ground as if looking for a shadow on the grass.
Crous dal lavour	Tal so grin	*Agitato*/*Nervoso*		The singers tries to stand up several times, always falling back on the ground.
Italia, non lusint?	Ciantant,ciant, dismintiat	*Celebrativo*		Standing, holding the hand mirror upside-down as a microphone. Declaim the text as an official speech of a political leader to the nation.
Doman a si mour	Jesus, Jesus, Jesus	*Dolente/Lamentoso*		

Correspondences between fragments of text, expressive indications, singing techniques and theatrical actions in Narciso

Appendix 3

Several were the interpretations of the map T-O. The shortest line of the letter 'T' represented the

Mediterranean Sea between three continents, while the 'O' stood for the primordial ocean which surrounded the earth surface. Some versions stressed the connection of the map to theology, others its relationship with the war in Africa and the journey across the sea during the Roman Empire. Nowadays, the question is how the journey transmutes the wide space of the sea, where sounds travel long distances, into the narrow boundaries of the mind, in which thoughts and memories multiply and repeat themselves in an obsessive mechanism of echoes. Sometimes, the physical destination can be reached, but the sea monster with seven heads and ten horns, which Christianity depicted in the Apocalypse in order to discourage navigation, turns into reverberating delusions. How does Western society deal with post-traumatic disorders, and how do they influence the public's perception of immigration?

ECLAT Festival concert, 9 February 2014 – Programme notes

Appendix 4

Hungarian version	German translation
VEZÉRLŐ	CONTROLLER
maga alá helyezi	unter sich platziert seine
a személyiséget műanyag	persönlichkeit mit kunststoff
védi az áramköröktől	vor stromkreisen geschützt
gombokban futnak	in schaltern laufen zusammen
össze vezetékei	all seine kabel
idegvégződések irányítják	nervenenden steuern
izgatottságát és ridegségét	seine aufregung und lieblosigkeit
ujjainak hőmérsékletét	die temperatur seiner finger
indítja a billentyűzetet	setzt die tastatur in gang
hidegre kisebb	bei kälte weniger
melegre mélyebben	bei wärme tiefer
merül ereszkedik a gomb	versinkt der schalter
közelebb enged	macht näher zugänglich
az alaplemezhez kitárul	die festplatte die maschine
a gép láttatja kisüléseit	gibt ihre entladung heraus
meghibásodásainak nyomait	die spuren ihres defekts
a páka beavatkozását	den eingriff des lötkolbens
a huzalokon	an ihren drähten
az elsők kísérleti	die ersten tragen in sich
anyagokat hordoznak	experimentelle substanzen
a vezérlő fedett	das bedeckte strahlen
sugárzása nem segíti	des controllers hilft

az együttműködést	der zusammenarbeit nicht
de közelebb visz	aber führt näher
a gépből az elektródák	elektroden von einer
a másikra	maschine zur anderen
összeköti a szerveket	verbindet die organe
meri agytevékenységét	misst die gehirnaktivität
kivetíti a memóriatérképet	projektiert die memory-maps
tápanyagokat adagol	dosiert nährstoffe
a gombbal táplálja	auf knopfdruck füttert
rezgést irányít így ad	steuert vibration bereitet
örömöt elektródái	so freude die elektroden
simogatják megszabadítják	streicheln befreien
a hajába ragadt flittertől	seine haare vom klebrigen flitter
szűr a légzésmérő fertőtleníti	der atemmesser filtert
a vájatokat a mélyedések	die fugen desinfiziert die muskeln
izmait karbantartja	der vertiefungen hält intakt
ne okozzon kárt	keinen schaden zu verursachen
a másik az egyetlen nem	die andere das einzige nein
ismeri az összehasonlítást	kennt nicht den vergleich
létezése tökéletes	perfektioniert ihre existenz
a vezérlőpult	das kontrollpult reagiert
azonnal reagál a kibocsátott	sofort auf die ausgesendeten
ingerekre és kezel	reize und behandelt
nem ismeri a tartósságot	nie etwas das dauert
fájdalma pillanatnyi	ihr schmerz ist jetzt
a vezérlő menti meg	controller ist die rettung
ereszkedése lassú pihenés	ihr sinkflug entspannung

HÓGÖMB	SCHNEEKUGEL
zárja a védőkupak	schutzhaube aufgesetzt
hógömbben ül	in der schneekugel sitzend
a nyomás miatt	aufgrund des drucks
délben fejre állítják	mittags auf den kopf gestellt
helye szimmetrikus	symmetrisch platziert
visszaveri a sugarakat	reflektiert er die strahlen
a padlóról leeső flitterek	der dem fußboden entstürzende flitter
nem ragadnak bőrére	klebt nicht an seiner haut
nem izzad az alakok	die schwitzt nicht die figuren
leperegnek róla zselés	blättern von ihm ab geleeartiges
ápolóanyag vonja be	pflegemittel überzieht ihn

tartósít és finomít	es konserviert und verfeinert
a felszínen nyugtatja	beruhigt auf der oberfläche
szívja a salakanyagot	saugt die ausscheidungen
visszaalakítja a károsból	rückverwandeln von schadstoffen
létrehozza a szükségest	erschafft das notwendige
a hordozó az örömön	der träger teilt sich mit ihm
osztozik vele a vezérlő	die freude der controller
legjobbjait örökíti	verewigt die besten seiner art

ELBA	DIE ELBE
a nő csikóhal combján válla	die frau ein seepferd der schenkel über ihrer schultern
hal sellőn hullám az Elba	ein fisch eine welle über eine meerjungfrau ist die elbe
a hangok a sípcső alapon	klänge aus dem orgelpfeifengrund
száján adja ki egyszerre	durch ihren mund gleichzeitig hinaus
ereszti a levegőt	atmend die luft
testét átfúrják az énekléshez	ihr körper durchbohrt für den gesang
a sípcsöveket kihúzzák engedi	orgelpfeifen herausgezogen atmet sie
a levegőt száján és az új	luft durch den mund aus und
helyeken felületéhez	an neuen stellen auf ihrer oberfläche
rakják fújnak a kis réseken	angebrachte pfeifen durch enge spalten
áténekelnek a mellkasán	singen aus ihrer brust

Text of the three poems from ALL MACHINE *used in* Controller *and* Die Elbe

```
// - vowel O -
playnote(snd1,track=1,transp=-6.5,amp(0,0.7),at=710)
playnote(snd1,track=2,transp=1,amp(0,0.5),at=660)
playnote(snd1,track=3,transp=20,amp(0,0.1),at=745)
```

Example of coding used with QRT in Controller

Appendix 5

Guide to documentation on Disc1 and Disc2.

Disc 1: Recordings, patches and technical requirements

- Patches for *Controller*. - Patches for *Cera*. - Technical Requirements. - *T-O*, Neue Vocalsolisten, ECLAT Festival 2014, Theaterhaus (Stuttgart, February 2014). - *Controller*, Silvia Rosani and Kinga Tóth, HKI (Stuttgart, December 2014). - *Die Elbe*, Trio vis-à-vis, HKI (Stuttgart, December 2014).

Disc2: Videos
- *T-O*, performed by the Neue Vocalsolisten at ECLAT Festival 2014, Theaterhaus, Stuttgart (9/2/2014). - *Controller*, performed by Silvia Rosani and Kinga Tóth at HKI in Stuttgart (5/12/2014). - *Die Elbe*, performed by Trio Vis-à-vis at HKI in Stuttgart (5/12/2014).

One more version of *T-O* can be listened to via my website at <http://silviarosani.webs.com/music>. It is the recording of the performance of the Neue Vocalsolisten at MATA Festival 2014, New York (20/4/2014). This version, though, is for two sopranos, one mezzo-soprano, tenor and bass. At the same page, one can also listen to *Omertà* for voice and live electronics.