Harmony As Superimposition: Composing with Polychords, Sets and Aggregates in 21st Century Peru

By

Antonio Gervasoni

A thesis submitted to
the University of Birmingham
for the degree of
MASTER OF ARTS IN COMPOSITION

Department of Music
School of Humanities
College of Arts and Law
University of Birmingham
September 2020

ABSTRACT

Complex harmonic structures, such as polychords, have played an important role in the development of contemporary classical music. Composers have used them—some more than others—in many ways but a standard theory of their use has yet to be formed, despite occasional mentions from a handful of authors. This commentary discusses the use of these and other complex harmonic structures in excerpts from relevant composers' pieces and compares them to examples of the pieces featured in the attached portfolio. The analysis shows their potential not only as a means to effectively delineate the development of harmony, but also as a means of expression and definition of musical form. Some strategies, tools and points of view for the analysis are also suggested, which may be useful for their study and application.

DEDICATION

To Mercedes, Ernesto, Adolf, Gladys, Luisa and Fernando, without whose help and support it would have been impossible for me to carry out this work.

ACKNOWLEDGMENTS

I would like to express my gratitude and appreciation for my supervisor, Professor Michael Zev Gordon, whose guidance, support, and encouragement have been invaluable throughout this study. I also want to thank all the members of the Music Department staff who have played a role, however small, in making it possible for me to meet the goals of my study programme.

Contents

List of Figures

List of Tables

Chapter One

Prologue

1.1 Introduction

Harmony has always been the aspect of music that most attracts my attention. When I compose, I usually start by deciding the harmonic colour of what I want to write. I sit in front of my MIDI controller and, unless I already have a musical idea in mind, I start looking for harmonies that, in my view, reflect whatever I want to express.

The evolution of harmony in Western music in the 20th and 21st centuries is of particular interest to me. After more than 100 years of harmonic development, from Debussy to Lutosławski (and beyond), is there anything else to do? Is there a path that perhaps has not been sufficiently explored? Micro-tonality is certainly one of those paths, but I think there are still possibilities outside the micro division of sound space and one of them is that offered by complex harmonic structures.

Polychords are a type of such structures. They appear most notably in the works of Stravinsky and Prokofiev, but can even be found in the music of composers not commonly associated with this concept, such as Britten and Shostakovich. They have been briefly

studied by a handful of authors, such as Persichetti and Ulehla, but a standard opinion on them has not been generally adopted and there is still ample room for research and musical creation based on their use.

Even though the initial proposal for this master's programme contemplated exploring the potential of polychords as a means of developing a particular sound, while writing the pieces, I discovered that I could see these harmonic structures from other points of view. This led me to redefine the main theme of my study as the superimposition of harmonic elements and to propose alternative ways of designing harmonic complex structures, which will be discussed later.

1.2 Research Process

I began my study by transcribing several polychords from different sources, especially Persichetti. The result was a document I titled 'Polychord Book', an extensive catalogue from which I then extracted a smaller, more practical list titled 'Usable Polychords and Their Character', containing the polycohords that I found most interesting or that I believed had the best potential. These two documents can be found as appendices and will be explained in detail in the following chapter.

In addition to the above, I analysed the appearance of polychords in the works of different composers, from which some excerpts will be presented to illustrate the discussion about their use.

1.3 Context

Before moving on to the main subject, a few words about the context of Peruvian music and the personal context that shaped my musical style.

The corpus of works by Peruvian composers is remarkably eclectic. After Peru's independence from Spain in 1821, Peruvian academic music made an acrobatic leap from Baroque to operatic Romanticism, which dominated the rest of the century. Then, in the early 20th century, without any post-romantic movement, we moved on to impressionism and nationalism which, as Petrozzi points out, 'does not refer to an ideological nationalism, but to the use of musical elements from popular traditions.' (Petrozzi, 2010, p. 48)

The so-called 'generation of the 50's'—of the 20th century—is even more diverse, with composers borrowing elements from popular music (Iturriaga, Pulgar Vidal), while others develop an interest in avant-garde techniques and electronic music (Valcárcel, Bolaños). Of the following generations, Petrozzi writes:

> 'Aesthetically, the "sons" of avant-garde composers of the sixties and seventies have rebelled against the avant-garde attitude of rejection of tradition and not only include diatonic or tonal elements in their compositions (Garrido-Lecca, Velarde), rather, they take up elements rejected by the avant-garde, such as the use of melody and counterpoint, narrative, and even programmatic music (Cuentas). On the other hand, in many cases, there is no real contact with the previous tradition or, in the case of Peruvian music, there are no means to know it, since it is not regularly interpreted and editions and recordings are practically non-existent. An influence of rock, pop and other popular genres not only Peruvian but also from the international market is also present in several composers (Cuentas, Velarde), perhaps constituting a current version of Creole

internationalism in the 19th century.' (Petrozzi, 2010, p. 48)

I would indeed be counted among those rebels that Petrozzi mentions. On the one hand, I don't find a good justification for consciously adopting a language that belongs to cultural and historical contexts so distant from mine and, on the other hand, it simply doesn't emerge as a natural consequence of my compositional process. I grew up listening to flamenco music and Italian folk songs, mixed with pop music and the classical works I played on the piano. Moreover, Peruvian folklore was not part of my family culture—of more European traditions—and, as inferred from the above, previous generations of Peruvian composers were pretty unknown to me, although in recent years, thanks to the work of our national casts, I have been able to come into contact with their music.

Chapter Two

Harmony

This chapter and the following chapters discuss different aspects of the music featured in the portfolio. However, it should be noted that these aspects, although discussed separately, overlap in much the same way as harmony and counterpoint do, both being different views of the same phenomenon.

2.1 Polychords

A polychord is commonly defined as a chord that is made up of two or more stacked chords. In his book 'Twentieth Century Harmony', Persichetti says the following:

> 'A polychord is the simultaneous combination of two or more chords from different harmonic areas. The segments of the polychord are referred to as chordal units. (...) Clear grouping of the chordal units is a requisite of polyharmony, and rearranging the tones of these units can destroy the polychordal organization.' (Persichetti, 1961, p. 135)

Therefore, according to Persichetti, the pitches that form a polychord must be organ-

ised in such a way that they are perceived as independent units that occur simultaneously. Sometimes, these units can indeed be perceived independently, if, for example, they are widely separated or if different timbres are assigned to each one, but generally, the effect is similar to what happens when we listen to an interval. In other words, we perceive a sound that, depending on our musical experience and training, we may identify as a confluence of different independent units, whether we hear them clearly or not.

The definition in Jazz theory is quite similar:

> '(...) by superimpositions we'll understand the vertical coincidence of two or more chords (...). The chords that make up the superposition can have the number of notes that we desire, although the most common is the use of triads.' (Vergés, 2007, p. 266)

However, not any combination of chords is accepted in Jazz. Vergés is quick to observe that many of them 'can be excellent, others of a sound within the limits of the reasonable and others, in the extreme case, even out of all logic. (...) To avoid this, the superstructures must be governed by the only possible logic: the harmonic series (...).'

The foregoing excludes various polychord possibilities in Jazz music, but that is not the case in contemporary classical music, where the acceptable combinations are practically unlimited. Therefore, the logical first step before embarking in the composition of the works for this programme was to identify as many polychords as I could.

2.2 Classification

As noted in the Prologue, the appendices contain a document titled 'Polychord Book', which is actually not intended to contain all the possible polychords that exist—an unnecessary

task for the purpose of my study—only the ones that I believe could be more useful in a composition.

The Polychord Book classifies polychords into various categories according to the chordal units involved, but does not provide information on how they sound. The list is also quite large and I was afraid that I would easily get lost in it. Therefore, I decided to reduce the possibilities to a more practical number and classify them not in terms of their components but their overall colour.

I then prepared a smaller list called 'Usable Polychords and Their Character', in which a subset of entries from the Polychord Book are organised into three categories: Relaxed, Spicy and Tense, three names that respond to my own perception of the colour of each polychord, which is mostly related to its interval content and the way in which the intervals are arranged. Between the staves, a symbol represents the general sonority of the polychord (plus sign = major; minus sign = minor, h = hybrid, etc.). Beneath the system, a number from 1 to 3 differentiates three degrees in each category, with 3 for those that sound closest to the next category. A descriptor for identification purposes follows the latter, and is then followed by the Forte number of the pitch-class set associated with each polychord. When composing, a cipher like R9(2), for example, indicates the ninth polychord in the Relaxed category, transposed so that its lower chord has pitch class 2 (D) as its root.

2.3 Sets

A second way to use polychords is to treat them simply as harmonic starting points by looking at them as pitch-class sets. Persichetti would argue that in this way we are effectively destroying their sound and no longer using polychords, but why would this be a problem if the result meets our expressive needs? After all, it is this result that interests us. In a sense,

we could say that although it doesn't organise the pitches as polychords, it is the direct result of 'polychordal thinking'.

Also, a quick glance at the Polychord Book will reveal that two polychords can share the same pitch-class set and yet be classified as different. Therefore, by looking at them in this way, we can use a type of supra-entity (the pitch-class set) that represents multiple polychords at the same time, an idea that introduces an interesting concept: harmonic ambiguity.

2.4 Aggregates

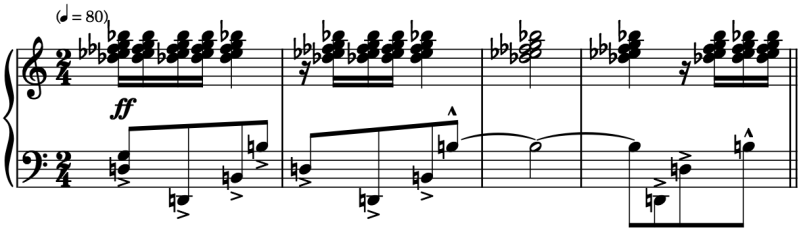
A third option is to go beyond the definition of polychords and no longer consider just adding simple triads but any group of pitches. This is where the concept of aggregates comes into play.

In his book 'The Music of Lutosławski', Charles Bodman Rae uses the term 'aggregate' to refer to 'pitch collections that contain two or more superimposed chords'. (Rae, 2012, Chapter 3, para. 9) He calls them this way instead of using the term polychord because he's describing the twelve-note chords formed by the superimposition of three seventh chords that Lutosławski used in many of his works.

In the third composition of the portfolio, 'The Spirits of Cahuachi', I used a similar type of harmonic construction, although I came to it in a different way than Lutosławski, not adding chords but extracting them from a 'super chord', as I'll explain below.

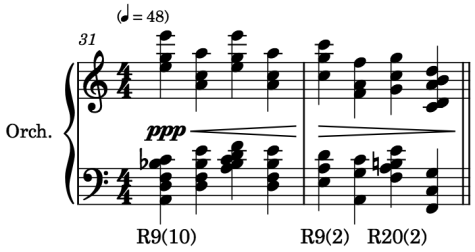
2.5 Polychords: Presentation

The first and most obvious way to present a polychord is simply to write it as Persichetti suggests: with its units separated by enough space to allow the harmonic conflict of their simultaneity to be perceived. However, every time I tried to use them this way, I felt that the resulting sound was a bit boring and unappealing. The two triads can sometimes be heard too clearly and I wanted a more ambiguous sound, one in which the basic components could be difficult to identify. Therefore, I preferred a more indirect approach, like the one Stravinsky takes in this excerpt of his Symphony in Three Movements.



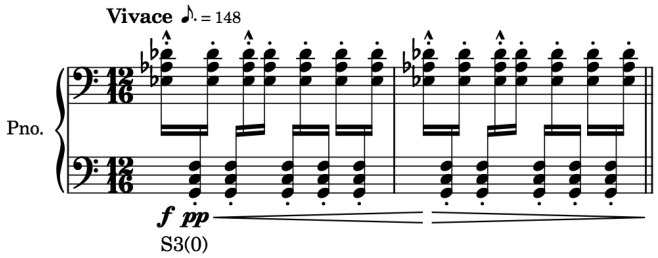
Example 2.1: Stravinsky, Symphony in Three Movements, fig. 102

A way to analyse this example would be to say that two chords (which could be E-flat and C-sharp diminished 7th) have been merged into a cluster while a third is presented as an arpeggio. The destruction of the characteristic sound of polychords by merging their component chords into a cluster is therefore a possible way to use them, like in the following excerpt from my piano concerto:



Example 2.2: Gervasoni, Piano Concerto, 1st mov., b. 31-32

Another way to destroy the characteristic sound of a polychord is to write its units closer together (although not close enough to create a cluster), as in this example of the opening bars of the second movement of my concerto. Other than that, I have also exchanged a pitch between the units. Furthermore, as a result of them being presented alternately, the presence of a polychord as the basis for the entire passage becomes even less clear. However, its sound, its essence, so to speak, is preserved.



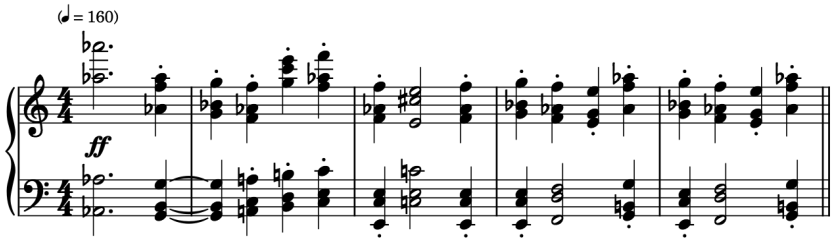
Example 2.3: Gervasoni, Piano Concerto, 2nd mov., b. 1-2

2.6 Polychords: Harmonic Masking

The harmonic complexity of a polychord, even a very simple one, has the potential to hide—or at least make it difficult to identify—highly discernible harmonic structures, an effect that we might call 'harmonic masking', much like the same concept found in psychoacoustics.

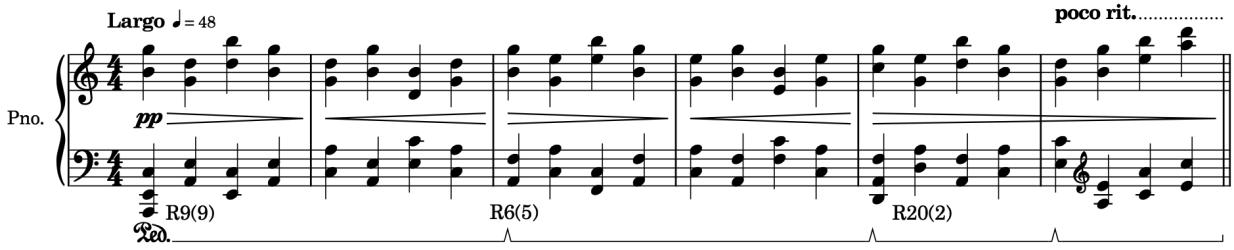
This phenomenon has been used extensively by composers like Stravinsky, and it remains an effective way to breathe new life into old ideas.

In this second example of Stravinsky's Symphony in Three Movements, it is unclear whether these are polychords with missing fifths or simply thirds in opposition. However, the chords (perhaps dyads would be a better word) are written in different registers, a feature of polychord writing. Played separately, the two parts have a fairly simple sound, but together, that simplicity is hidden and becomes difficult to distinguish.



Example 2.4: Stravinsky, Symphony in Three Movements, 1st mov., b. 3-7

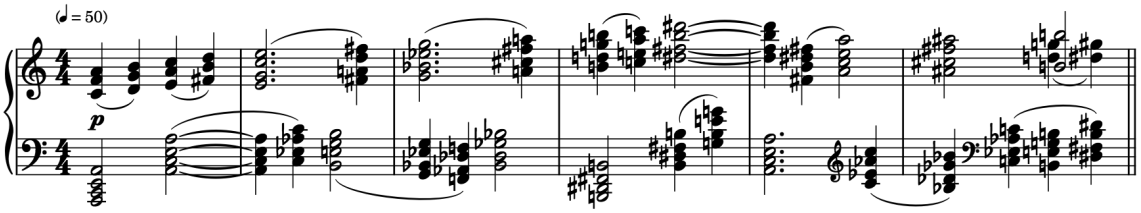
I took a similar approach in the opening bars of my piano concerto. Here we can see simple arpeggios on the triadic units of different polychords. In this way, despite the fact that arpeggios are a fairly common sound in Western music, their simultaneous appearance in the conflicting chordal units of a polychord makes them difficult to recognise unless one pays close attention.



Example 2.5: Gervasoni, Piano Concerto, 1st mov., b. 1-6

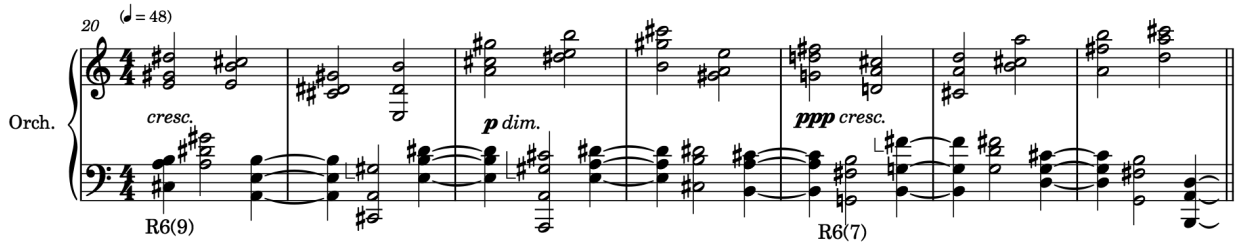
2.7 Polychords: Voice Leading & Pitch Re-Arrangement

This example from Rautavaara's Cantus Arcticus shows careful writing of the external voices. This makes the passage sound more convincing because those voices are more exposed and the ear, accustomed to the common practices in traditional harmonic voicing (diatonic movement, preference for small intervals over large ones, consonant leaps, etc.), finds certain logic in their progression.



Example 2.6: Rautavaara, Cantus Arcticus, 2nd mov., fig. 1

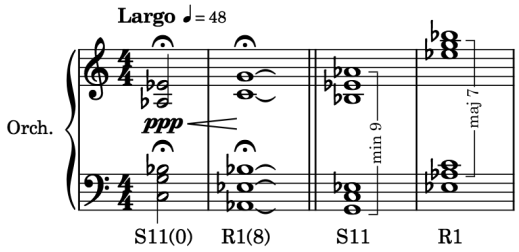
The following passage from my piano concerto shows the same characteristic and adds one more: the constant rearrangement of the pitches of a single polychord. The result is, of course, the perception of some form of chord progression—which could be easily determined—but the fact is that I was only rearranging the pitches of a single polychord when I wrote it.



Example 2.7: Gervasoni, Piano Concerto, 3rd mov., b. 20-23

In a similar case, the opening bars of the third movement show a remarkable characteristic of polychords: their ability to sound radically different depending on the arrangement of their pitches. Indeed, the chords of the first and second bars share exactly the same pitches, however the intervals produced by their particular arrangement in each chord make them sound so different that I've listed the first as a 'Spicy' chord and the second as a member of the 'Relaxed' category.

On the right, I've written the chords as they appear in 'Usable Polychords and Their Character' (but transposed to match the pitches in the example). In the first chord, there is a minor ninth between two pitches of the chordal units (G and A-flat). In the second, however, the pitches are arranged for a major seventh to appear. During the composition process, however, the decision to write the first chord with a closer spacing resulted in the disappearance of the minor ninth and its replacement by a semitone. But the fact remains that, in my catalog, both chords are considered different and are listed in separate categories.

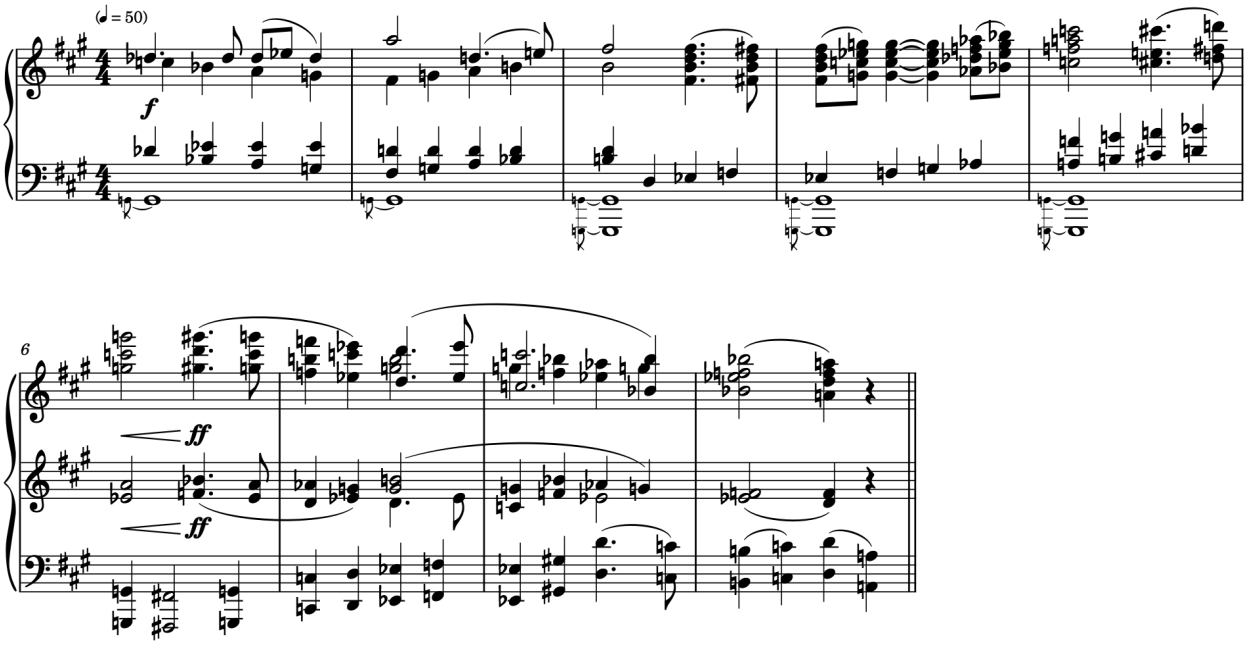


Example 2.8: Gervasoni, Piano Concerto, 3rd mov., b. 1-2

2.8 Polychords: Tension & Release

Since polychords introduce more tension than simple triads, they have often been used to establish high-tension points, preceded and succeeded by lower-tension events, in parallel with the traditional opposition of dissonance and consonance to achieve a sense of movement.

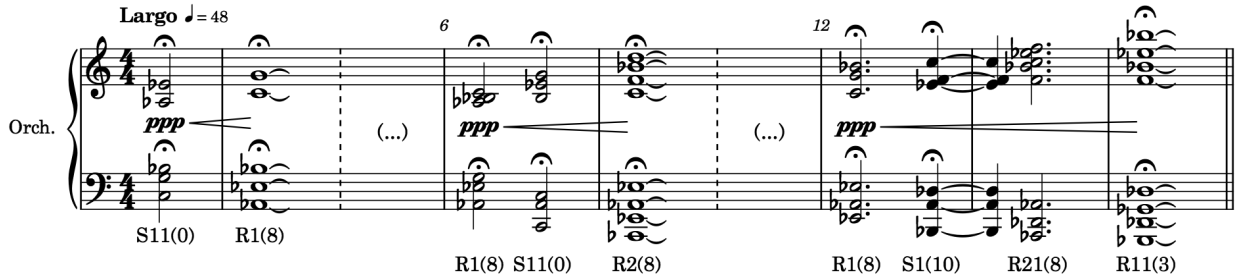
The following example, by Shostakovich, serves to illustrate this concept:



Example 2.9: Shostakovich, Symphony No.5, 3rd mov., 2 bars before fig. 82

The passage makes use of chromatic scale progressions that gradually introduce more and more tension until a climax is reached in the third beat of the sixth bar in the form of a polychord which could be described as a B-flat dominant 7th chord on top of an augmented chord over F-sharp. This is followed by a progression that resolves the tension into a simple triad, a C minor chord, which is then quickly abandoned through another progression leading to a D minor chord.

In a piece written entirely with polychords, this process can be accomplished by varying the degree of tension of the polychords. This is where the list 'Usable Polychords and Their Character' takes on great importance. The beginning of the third movement of my piano concerto serves as an example. In it, an idea is repeated three times, each time introduced by a series of chords on the strings. Here is a reduction of the three introductory passages of the strings, of which the first one has already been presented in Example 8:

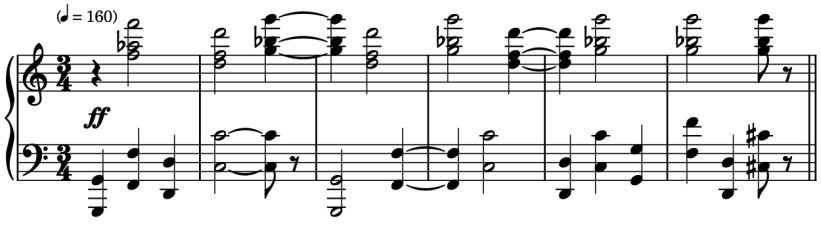


Example 2.10: Gervasoni, Piano Concerto, 3rd mov,. b.1-2, 6-7 & 12-14

The movement begins directly on a somewhat tense polychord, as we have seen before. Then the tension is reduced by moving to a polychord from the Relaxed category. The next two introductions show an R-S-R progression, again following the idea of varying the degree of tension to create a sense of movement.

2.9 Polychords: Density

Density changes can be used in a number of ways, from simply introducing contrast to creating a sense of direction. The following example shows a much lower density than the one shown in Example 2.1 (Polychords: Presentation), but both come from the same movement of the same piece by Stravinsky.



Example 2.11: Stravinsky, Symphony in Three Movements, 1st mov., fig. 3, b. 3

An example of density creating a sense of direction can be found in the passage already quoted in Example 2.7, which begins a gradual crescendo towards the climax of the piece at bar 40. If we follow the chord progression and write down the density of the chords (the number of pitches they contain), we get the following:

Bar	Density
20	6
24	6
28	7
30	6
32	5
34	6
36	5
37	6
38	4
38, 3rd beat	6
39	6
39, 3rd beat	6
40	7

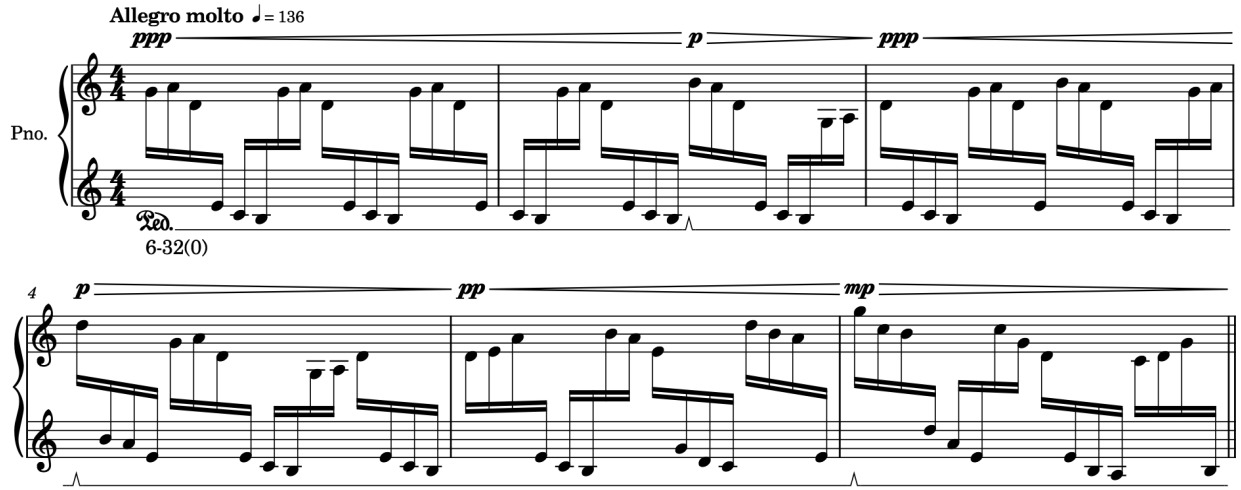
Table 2.1: Gervasoni, Piano Concerto, 3rd mov., b. 20-40, chord density

As we can see, the density starts around 6 and decreases to 4 at bar 38, which coincides with a decrescendo to pianissimo from which the crescendo that leads to the climax will begin. This is reached at bar 40, where a fortissimo dynamic coincides with a density of 7.

Of course, density is not the only factor contributing to the sense of direction in this passage; others, such as dynamics and melodic movement, also participate.

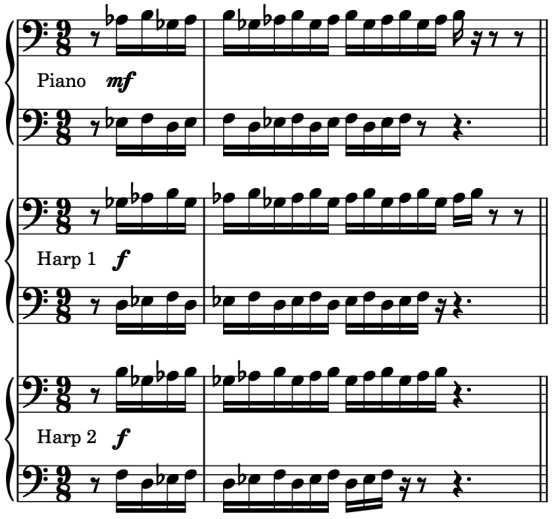
2.10 Sets: Moving Clusters

At the beginning of this chapter I mentioned a second way to use polychords: their treatment as harmonic starting points by looking at them as pitch-class sets. This is what I did in the opening of the fourth movement of my piano concerto, in which the use of polychords was temporarily suspended in favour of a harmony based on pitch-class sets.



Example 2.12: Gervasoni, Piano Concerto, 4th mov,. b. 1-8

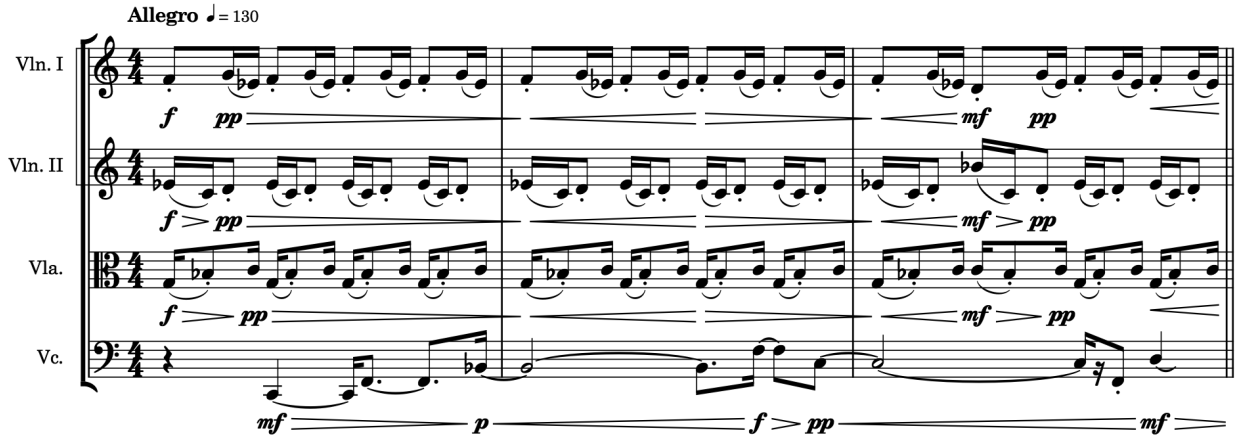
Examples of this can be found in the music of composers such as Lutosławski, as in the following excerpt from his Fourth Symphony:



Example 2.13: Lutoslawski, Symphony No.4, fig. 26

In this passage, the instruments play two subsets of set 6-27: 3-7 in all the upper staves and 3-2 in all lower staves. The parts are out of phase, resulting in a cluster that conveys a sense of movement when, in fact, it is completely stable.

I took a similar approach in my piece Northern Landscapes, for string quartet. In this excerpt from the initial bars, the harmony arises from the texture created by the counterpoint. One single pitch-class set dominates the piece in the first 11 bars: set 6-32, a simple pitch collection known as the 'diatonic hexachord' (the scale of D'Arezzo in his Micrologus).

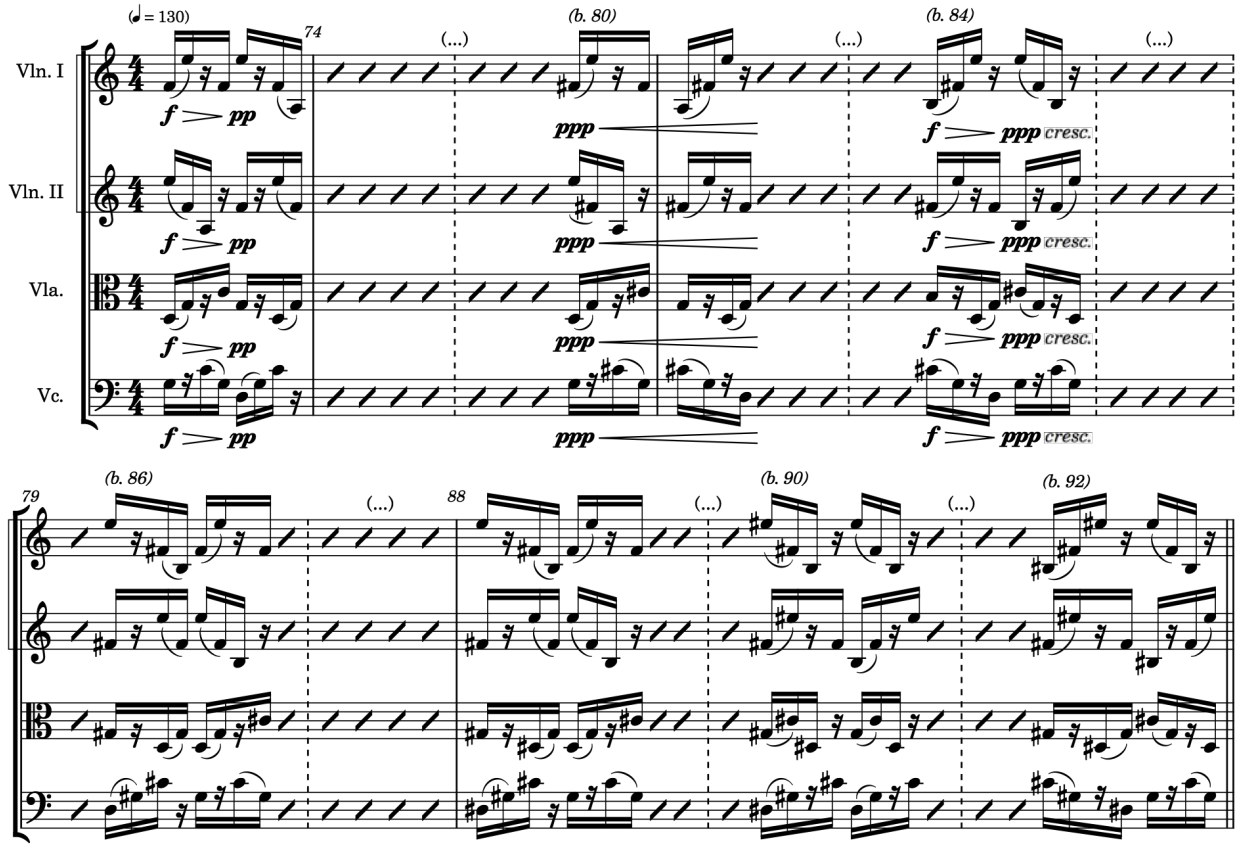


Example 2.14: Gervasoni, Northern Landscapes, b. 1-4

The harmonic material couldn't be simpler than that, but the counterpoint makes the harmony feel like a kind of moving diatonic cluster that serves as the background for the long durations in the cello.

Analysing the first beat, it contains the first six pitches of the scale of B-flat major (the D'Arezzo hexachord transposed to that pitch). The fast tempo puts the pitches so close to each other that the spaces between the notes become irrelevant and we perceive them all together as a kind of cluster. But this cluster is not stable. The melodic patterns emphasize different pitches of the hexachord, effectively changing its colour in the same way that a kaleidoscope constantly alters its visual patterns.

Deeper in the piece, mid-bar 73, begins a section in which the harmony slowly shifts from one pitch-class set to another by changing one or two notes at a time. In fact, the number of sharps increases progressively—making it seem like some kind of glissando is taking place—until at bar 97 all the notes are sharps. Again, the counterpoint creates a cluster effect with the same kaleidoscopic characteristic as the previous example.



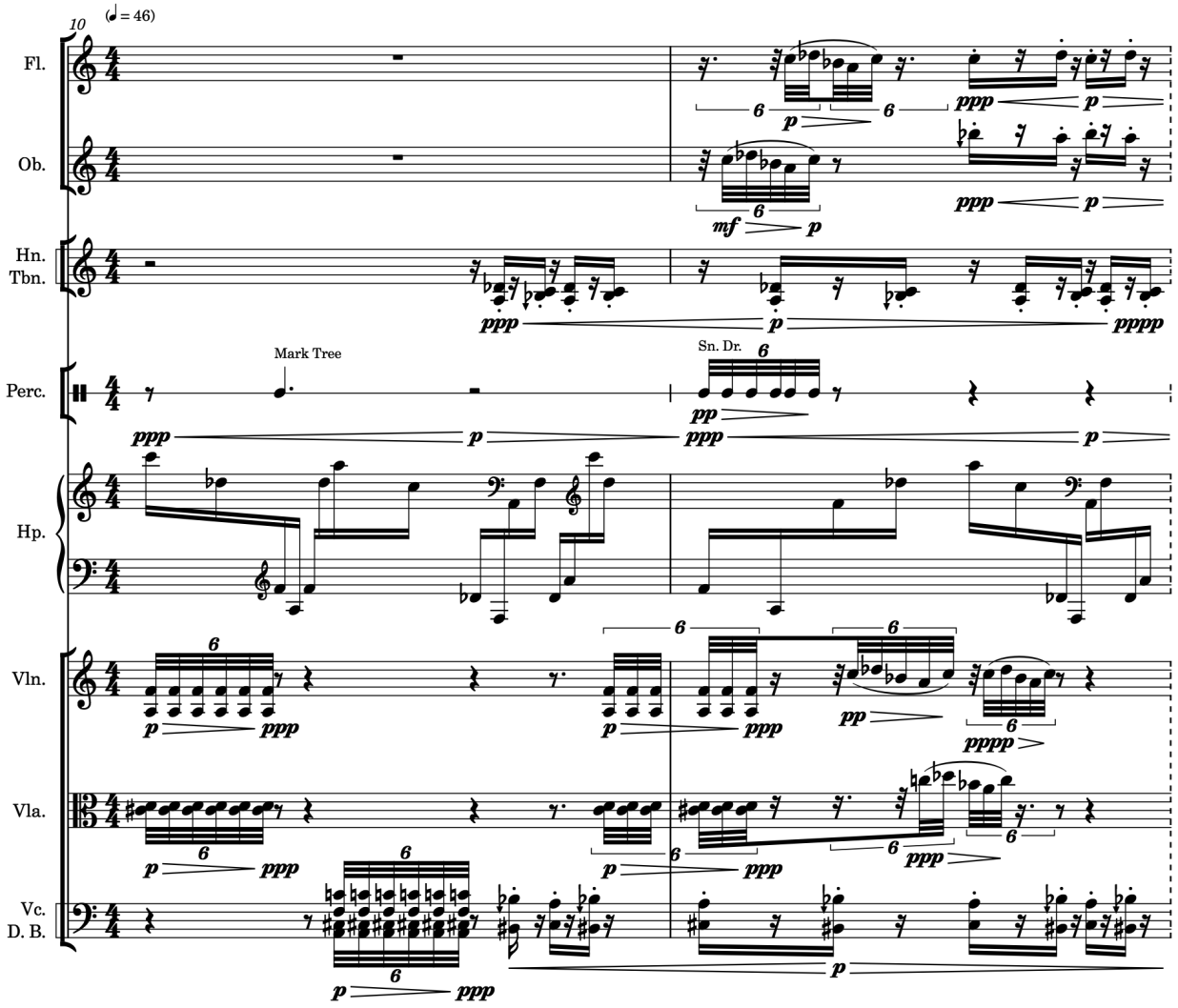
Example 2.15: Gervasoni, Northern Landscapes, fig. 4

2.11 Aggregates: Harmonic Field

I based my piece 'The spirits of Cahuachi' on the tones of the pipes of various Andean pan flutes, known as 'antaras', which were discovered in 1994 in a temple in the city of Cahuachi, the political and cultural center of the Nasca culture. I brought all the tones closer to our modern tuning system (some tones had to be written as quarter tones) and then stacked them as chords. The idea was to write the piece by grouping subsets of tones from each antara into individual non-triadic units and superimposing them in various ways.

In bars 10 to 13, several ideas are juxtaposed in different ways: sextuplets on the

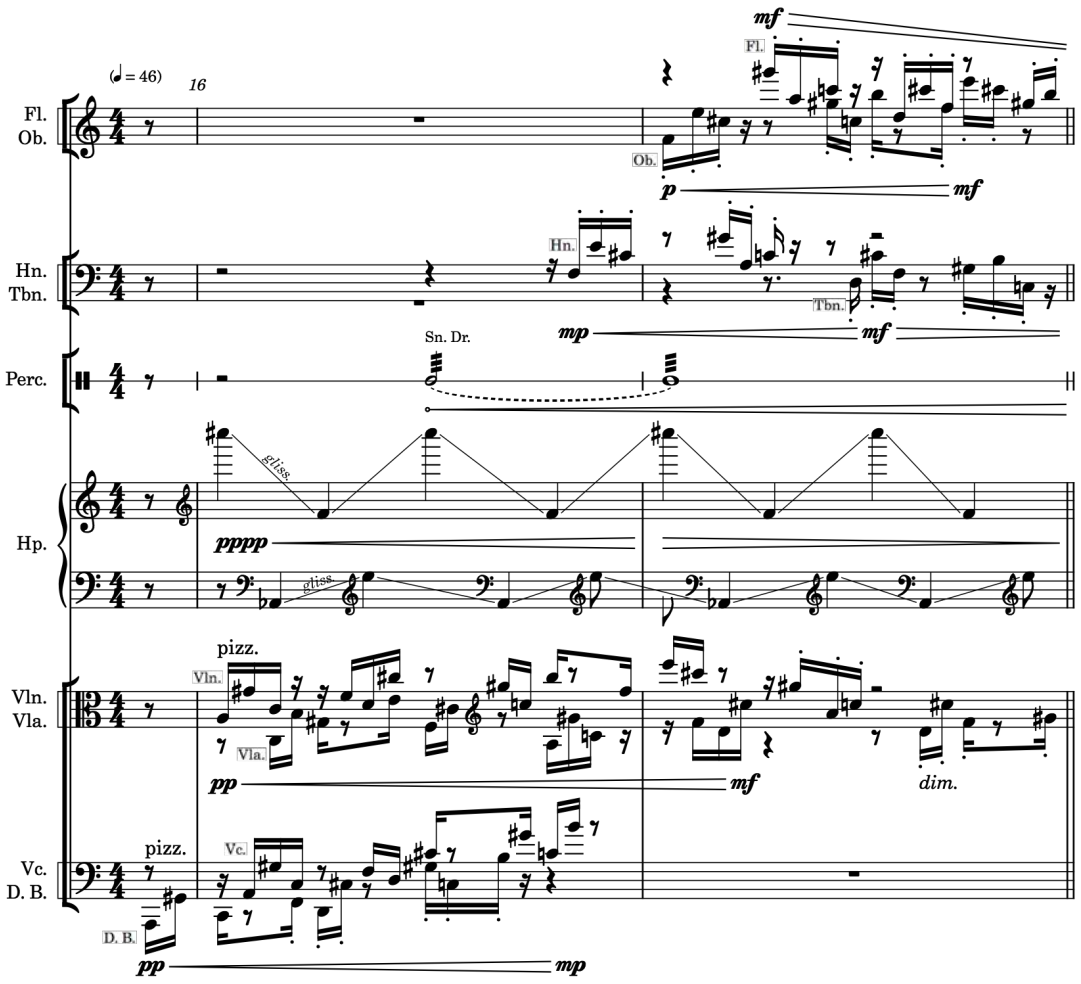
strings, an arpeggio on the harp, a kind of 'ticking motif' that jumps from one pair of instruments to another and a melodic motif also in sextuplets that is played in strict imitation by the oboe and flute. They are all based on different subsets of pitches from antaras 10 and 11 (both antaras share the same pitches, so I consider them a single unit). By presenting all of these elements as close as possible in a short period of time, an effect similar to the moving cluster described above is obtained, which I like to call 'harmonic field'.



Example 2.16: Gervasoni, The Spirits of Cahuachi, fig. 2

In bars 16 to 19, the pitches of antaras 16 and 17 (another pair sharing the same

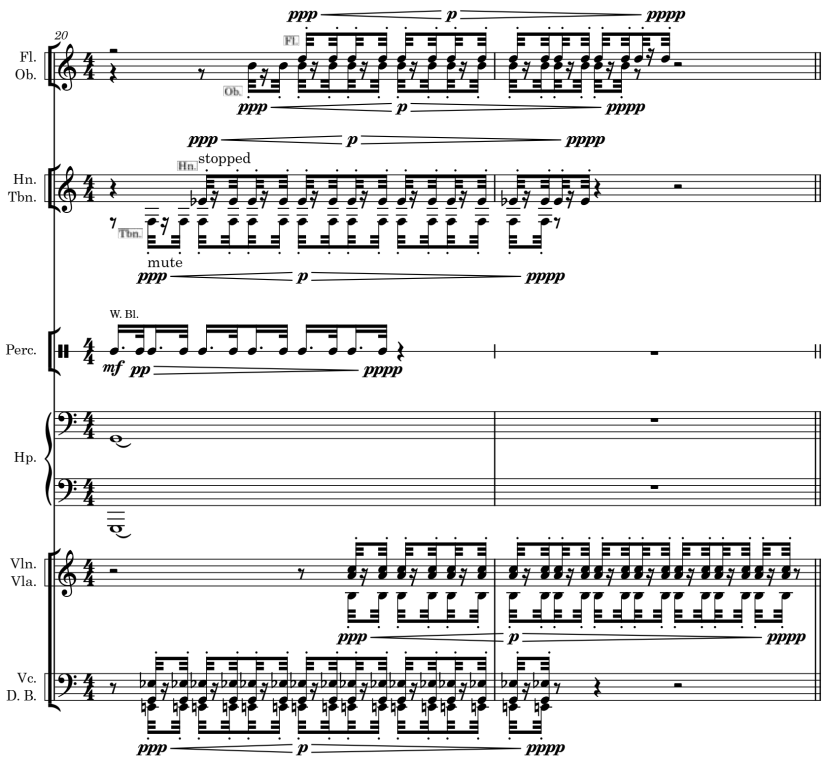
pitches) are used to create a canon made up of a chain of non-repeating melodic patterns that ascend and then descend. As with any canon, a harmony quickly arises, in which the tones of the antara (8 in total) are constantly rearranged, changing the overall colour of the passage.



Example 2.17: Gervasoni, The Spirits of Cahuachi, fig. 4

2.12 Aggregates: Chordal Approach

To end this chapter, an example of a more chordal approach from the same work. In bars 20 to 23, the pitches of antara 24 have been divided into three subsets. One of them has been assigned to the violin and viola, another to the cello and double bass and a third one to the winds. The pitch collections are presented simultaneously, but they are all intentionally out of phase, a characteristic feature of the work that is carried out in various ways throughout its different sections.



Example 2.18: Gervasoni, The Spirits of Cahuachi, fig. 5

Chapter Three

Expression

In this chapter, I'll discuss the role of harmony in my decisions regarding expression. I should start by clarifying first what I mean when I use the word 'expression'. In the context of this commentary, I use it to refer to the evolution of harmony in relation to an idea or concept that I wish to symbolise through music. In this sense, the listener's ability to identify the subject in question is not relevant. The concern here is how certain ideas determine the evolution of harmony, not whether that evolution can effectively convey any real meaning.

The evolution mentioned above can be designed in many different ways. One of them is by intuition. In other words, I can conclude that a certain idea must be expressed with this or that harmonic change by pure intuition. However, there are also times when the harmonic development of my music is strictly based on rational decisions or even on psychological concepts that I put into practice. In addition, there are also decisions that have a narrative basis, that is, that originate from an underlying narrative.

3.1 Ambiguity

One of the ways in which expression is manifested is through the presentation of conflicting materials, that is, through musical ambiguity, which can be defined as the potential of a syntactic element to be considered in different ways depending on the context or point of view, or both. Sloboda says the following about it:

> '(...) optionality is indeed highly probable when we are dealing with complex patterned material like music. Such material often displays structural ambiguity; that is, it can be grouped in different ways if different principles are invoked (rhythmic, harmonic, melodic, etc.,) or a given element can be serving a double function with respect to surrounding elements.' (Sloboda, 1986, p. 99)

Meyer points out another way of obtaining ambiguity, one that arises from the simultaneity of conflicting elements:

> 'If the number and diversity of the individual elements in a texture are so great as to obscure one another or if their placement is such that they cannot be perceived as clearly separated entities, then ambiguity may arise.' (Meyer, 1961, p. 192)

Ambiguity has, indeed, a strong relationship with the subject of this commentary, since polychords are essentially ambiguous harmonic constructions. Their appeal is based precisely on their conflicting nature, on their indefinite and sometimes vague character due to the opposition of their constituent components. This vagueness is not only related to their labeling, but also to the way they are heard, similar to the way we perceive a combination of two or more colours: sometimes we can easily identify which ones have been mixed, but sometimes this is hard to say, except, perhaps, for experts in color theory.

We can see ambiguity in Example 2.4. In the second beat of bar 2, for example, the F on the upper stave can be used to complete the lower triad, making it an F major chord. At the same time, the C in the lower stave can be used to complete the upper triad, turning it into an F minor chord. However, this is only one way of analysing this passage. Perhaps, instead both triads are simply lacking their fifths: E in the lower triad (minor chord) and B in the upper triad (diminished chord). This is where the ambiguity arises, but its lack of clarity, instead of presenting a problem, becomes a way of giving music more than one reading, making it less rigid and, at the same time, more interesting and more helpful to me as a composer.

Another example, out of many, of ambiguity, as Mayer describes it, can be found in the first section of the third movement of my piano concerto—already discussed in part in the previous chapter—in which I took some harmonic decisions based on purely rational ideas. One important aspect of the piece is that each movement is inspired by a poem. The one for this movement in particular begins with these words:

> 'I like for you to be still: it is as though you were absent, and you hear me from far away and my voice does not touch you.' (Neruda, 2017, Poem 15)

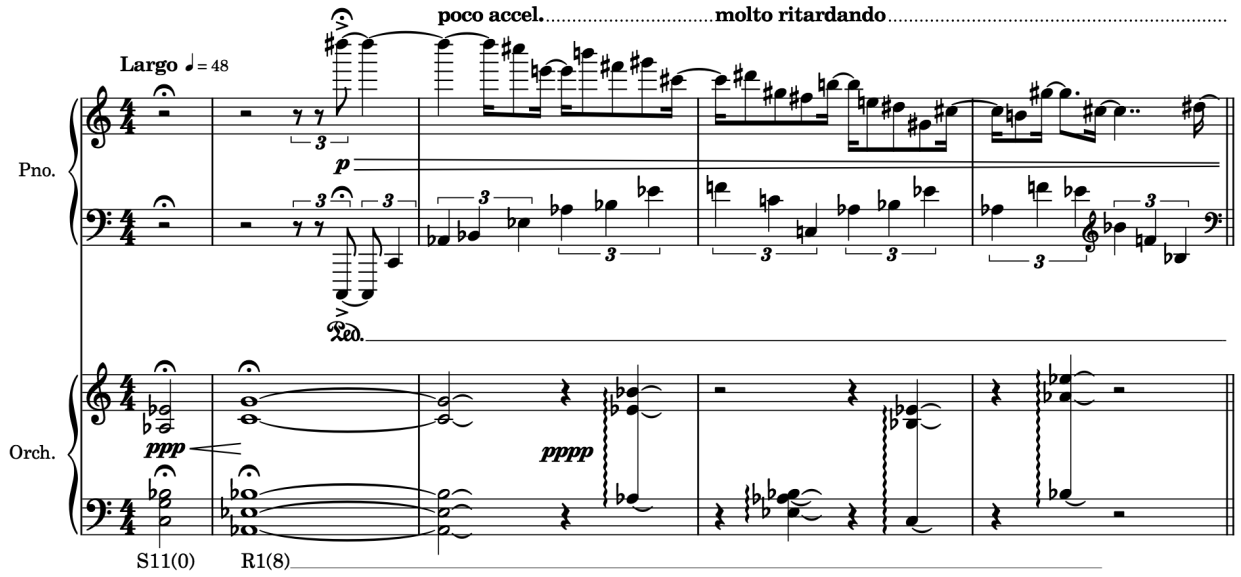
The strings play three chords and sustain the last one for four consecutive bars (they remain 'still'). In the solo part, a sort of contradiction occurs, which originates in the superimposition of different pitch-class sets in each hand. The chord on the strings corresponds to set 5-27 on G, the ones in the left hand form set 6-32 on E-flat and those in the right hand form the same set on C-flat (written enharmonically). The following table shows how these three sets overlap:

<table>
<tr><td>Strings</td><td>—</td><td rowspan="2">G, B-flat, C</td><td rowspan="3">A-flat, E-flat</td></tr>
<tr><td>Left Hand</td><td>F</td></tr>
<tr><td>Right Hand</td><td colspan="2">C-flat, D-flat, E, G-flat</td></tr>
</table>

Table 3.1: Gervasoni, Piano Concerto, 3rd mov., b. 1-6, harmonic layers

There are only two common pitches among the three sets: A-flat and E-flat. The strings and the left hand share three additional pitches, but the right hand doesn't share any other pitches with them. The left hand is, therefore, closely related to the chord in the strings, while the right hand plays several pitches that don't belong to that chord: it is 'far away'.

The result is an ambiguous harmonic construction ('it is as if you were absent'), but the ambiguity doesn't stop there. The winds take notes from the chord in the strings, three at a time, and establish a progression of cross-faded non-tonal triads that make the harmony seem to be constantly changing. Also, since the chord on the strings remains still, these chords in the winds tend to interact more with the notes on the piano, and since both hands play different sets, the result adds even more ambiguity to this section.



Example 3.1: Gervasoni, Piano Concerto, 3rd mov., b. 1-6

In a sense, the harmony is constantly twisted. The sustained chord acts like a pedal, suggesting the permanence of a musical element (the polychord) but the overlapping chords in the winds and melodic figures on the piano act as an opposing force, gently but effectively altering the overall colour of the harmony almost from one beat to the next. This effect is directly related to the conflicting nature of the chordal units of the polychord, mentioned above. A slight emphasis on some pitches pushes the harmonic colour in one direction, a subsequent emphasis on other pitches moves it in a different direction. Successive elements obscure each other, as Meyer indicates, creating ambiguity.

There is also ambiguity, albeit milder, in the last section of the movement. The strings play with the pitches of polychord R9, which rearrange every other beat. Since not all the pitches are presented together and since the bass line moves from one pitch of the chord to another, the passage sounds like a progression of different chords, although in reality everything is based on the same polychord.

The following table shows this chord progression in the strings written as sets. The number in parentheses indicates the relative transposition for each set. The bottom row shows the bass line, written as a sequence of numbers (C = 0, C-Sharp = 1, etc.)

Bar	64		65		66		67	
Set	4-14(4)	3-2(6)	4-22(4)	4-23(6)	4-11(4)	3-7(6)	3-9(9)	3-6(9)
Bass	8	6	4	8	6	9	11	1

Bar (cont.)	68		69		70		71	
Set (cont.)	[9,11]	4-10(6)	4-22(9)	4-10(6)	[9,11]	3-7(11)	3-7(8)	3-7(8)
Bass (cont.)	9	6	4	8	9	1	8	1

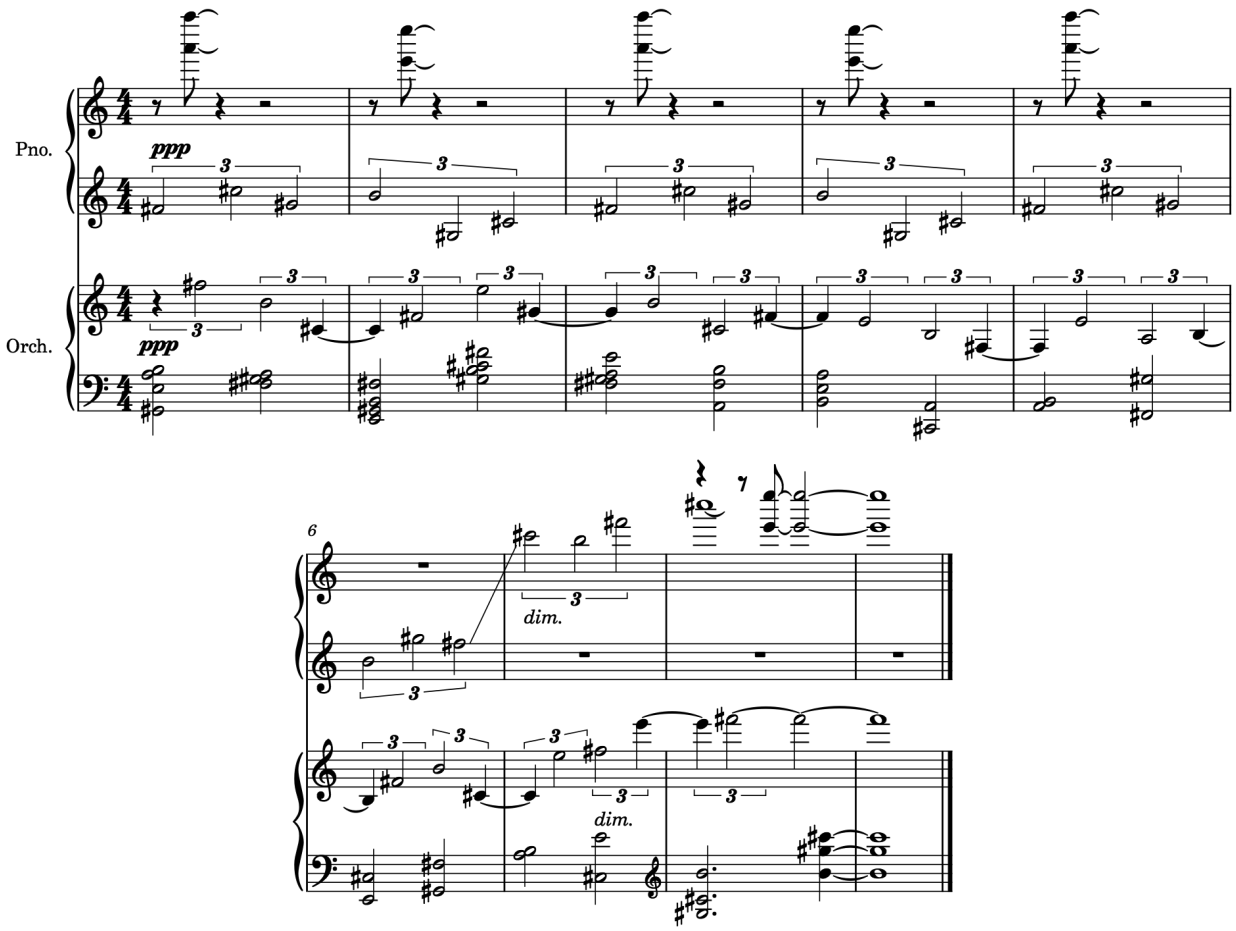
Table 3.2: Gervasoni, Piano Concerto, 3rd mov., b. 64-71, string part set progression

As mentioned before, the entire progression has been derived from polychord R9: an E major chord on top of an F-sharp minor chord, which produces set 6-32. However, the complete set is never used. Instead, various subsets are derived from it with the intention of producing a variable colour progression. Much diversity can be noticed in the harmonic density, which even drops to two pitches in bars 68 and 70. At the same time, no specific pitch dominates the bass line.

A second harmonic layer is established by the left hand and the winds, which play with four notes of the polychord: F-sharp, G-sharp, B and C-sharp, thus producing set 4-23. Differences in timbre help separate this line from the progression on the strings, favoring the opposition of elements already discussed.

Finally, a third harmonic layer is superimposed on the previous two: an alternation between the notes A and E on the right hand sustained by violin harmonics, an idea taken

from the first movement that refers to the vowels in the name of the dedicatee.



Example 3.2: Gervasoni, Piano Concerto, 3rd. mov., b. 64-72

Each independent layer tries to push the harmony in a different direction. However, it cannot be denied that the result is perceived as a single element in itself, as a clearly identifiable independent entity, just as we do with a mixture of colours or flavours whose basic components are difficult for us to define.

3.2 Narrative

I use the word 'narrative' in its traditional sense, as many authors have done in the analysis of musical works. For example, in his book 'Music and Sentiment', Charles Rosen says the following about the beginning of Beethoven's Sonata in E minor Op. 90:

> 'Starting with two opposed phrases, a rise and a descent, and then combining high and low registers together in a more intense expression, has the effect of a narrative form. It has a plot.' (Rae, 2012, p. 95)

The concept of narrative thus arises from the idea that a piece seems to tell some kind of story or express an idea, or a feeling, as in the clash between opposite musical characters that Rosen describes.

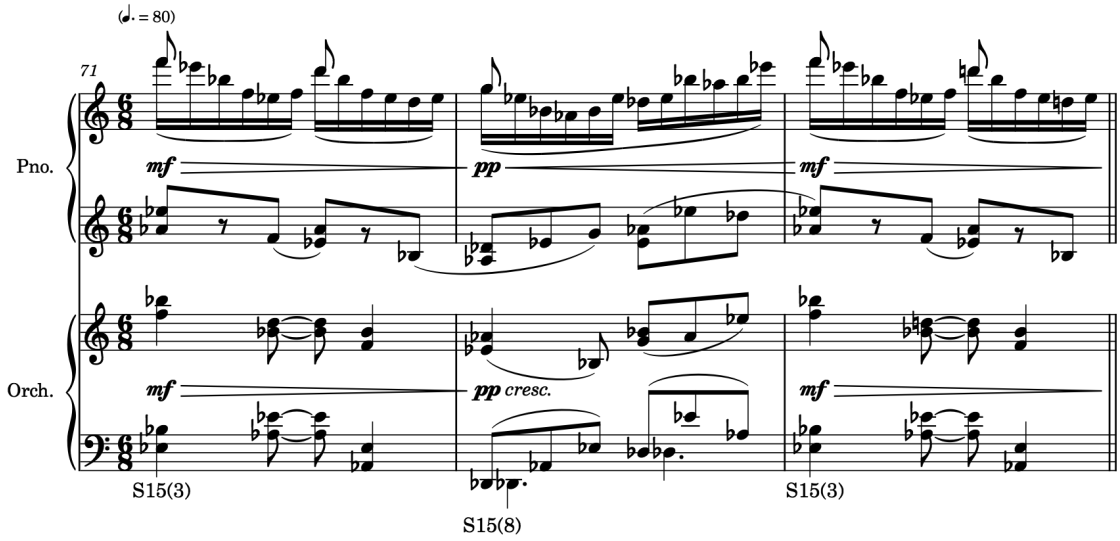
We could define two types of narrative, one based on extra-musical elements (a story, a character, a painting, etc.) and the other that arises from musical elements when considering their introduction, dissolution, reappearance, development, etc., as a plot in itself.

Both types of narrative can be found in my piano concerto, especially the first, since the work was conceived as a tribute in memory of a close person who passed away unexpectedly in 2019. There is a narrative in the general structure of the whole concerto: each movement has a title that begins with a consecutive letter of the name of the dedicatee. The titles reflect four traits of that person and, in turn, define the character of the music. Further, as mentioned before, each movement is related to a poem by Pablo Neruda, his preferred author.

The title of the first movement, 'Kind', reflects the gentle, relaxed sound of the harmony. The poem related to this movement is also very tender. Lines 7 and 8, however, make up a different section, a kind of brief interlude. Line 7 reads:

'Bonfire of awe in which my thirst was burning.' (Neruda, 2017, Poem 6)

Up to this point, only polychords from the 'Relaxed' category have appeared. However, this section makes use of a single polychord that is constantly transposed: S15, a major chord over an augmented chord by fourths. In the intervallic content of this polychord we find a major seventh, a tritone and a major ninth, which add tension to the harmony.



Example 3.3: Gervasoni, Piano Concerto, 1st mov., b. 71-75

This added tension is in keeping with the words of the poem but is not excessive, as it would be contrary to the character of the movement. From a harmonic point of view, it also develops an underlying narrative: my feelings regarding the loss of a loved one. However, other characteristics of the music, such as metre and rhythm, come into play and soften the sound of this passage. The Lombard rhythm of the left hand coupled to the hemiola of the strings, for example, gives the passage a dance-like character. In the right hand, the semiquavers are the same length as the demisemiquavers of the previous passage, thus maintaining the level of activity. The music sounds lighthearted and carefree.

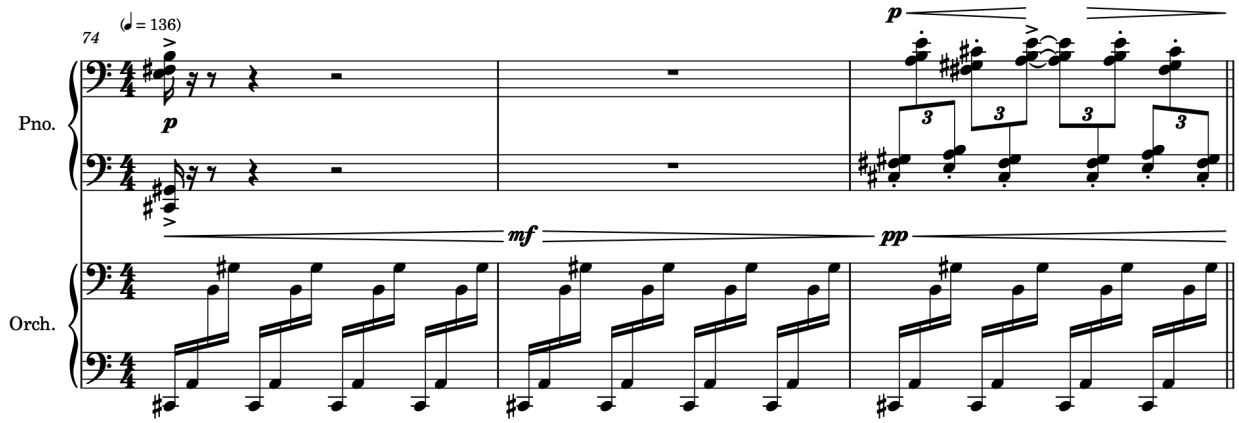
The result creates a contrast with the previous section in terms of character and

harmony but without deviating from the idea established by the title of the movement. After all, it is clear that line 7 does not describe a real bonfire or burning thirst, but figurative ones. It is a passionate declamation of burning love. Therefore, the slight tension of the harmony is softened by other elements to generate a similar contradiction, another example of ambiguity.

In Example 3.1, I showed how the words in the poem associated with the third movement of the concerto influenced my decisions regarding the music and resulted in the emergence of an ambiguous harmonic construction. In the same way, in other movements of the piece, the poems affected the narrative, as in the fourth movement, where the character of the second theme is directly related to line 9 of the poem, which says:

> 'Suddenly the wind howls and bangs at my shut window.' (Neruda, 2017, Poem 14)

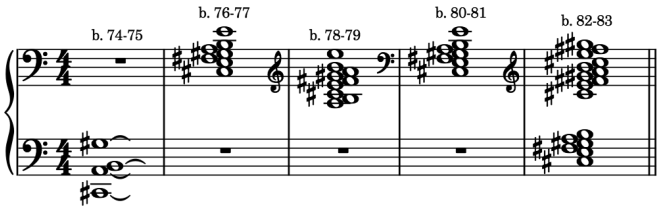
The theme is made up of a succession of quartal chords played staccato between both hands:



Example 3.4: Gervasoni, Piano Concerto, 4th mov., b. 74-77

Taken together, the chords form set 6-32 (the diatonic hexachord) but due to their

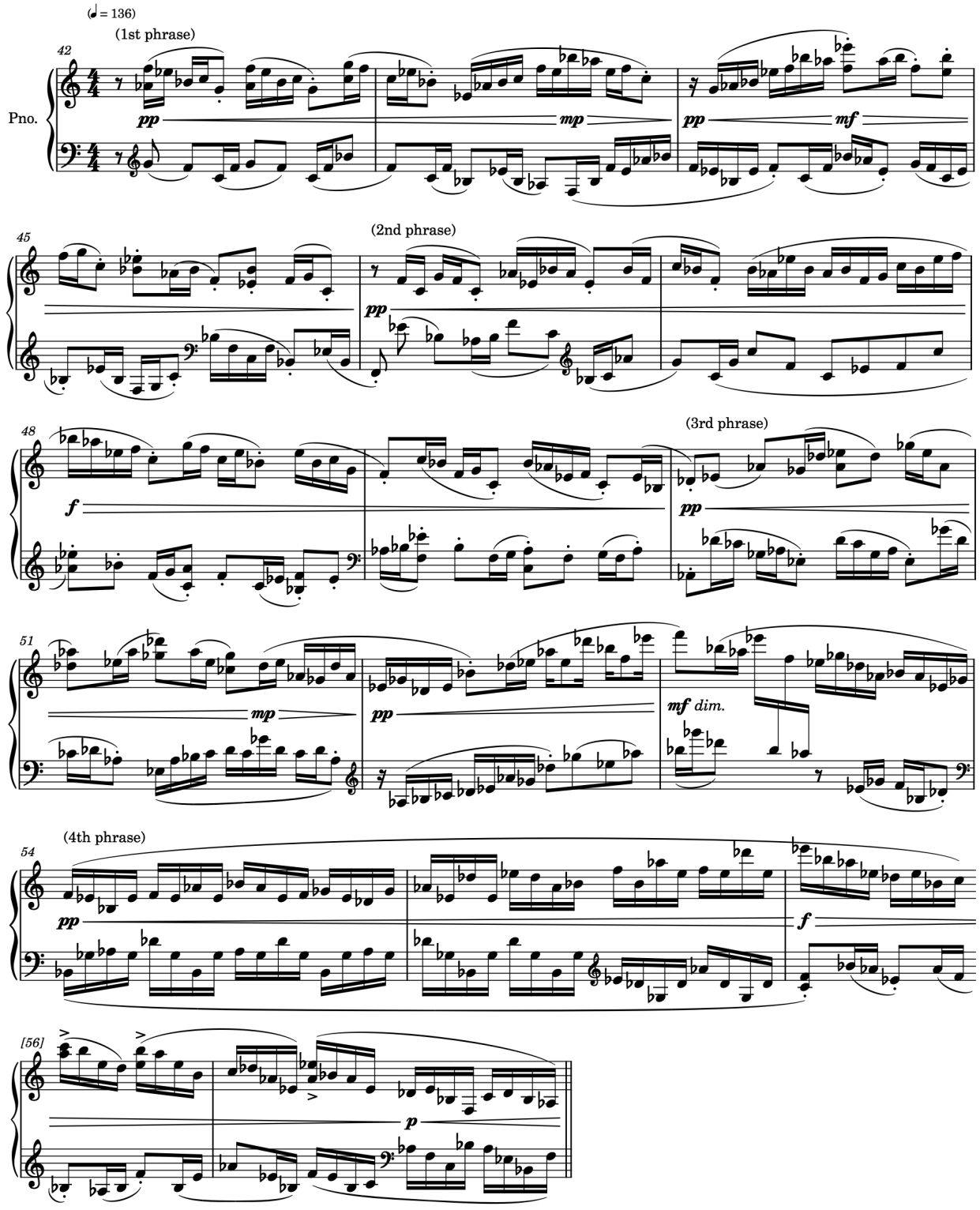
rapid alternation, a cluster effect is produced: a moving cluster, as we have seen before. To this we must add the sustained chord on the strings and the harp, which is formed by the first four notes of the Phrygian mode in G-sharp and serves as a stable background (a window) on which the moving cluster is constantly 'howling' and 'banging'. The following graph summarizes the harmonic scheme of bars 74 to 83.



Example 3.5: Gervasoni, Piano Concerto, 4th mov., b.74-83, diatonic clusters

This combination of mild dissonances on the piano and the tetrachord of the Phrygian mode in the orchestra give the second theme its own character, somewhat tense and melancholic at the same time, and differentiate it from that of the first theme which has a tendency to Lydian and is, therefore, lighter.

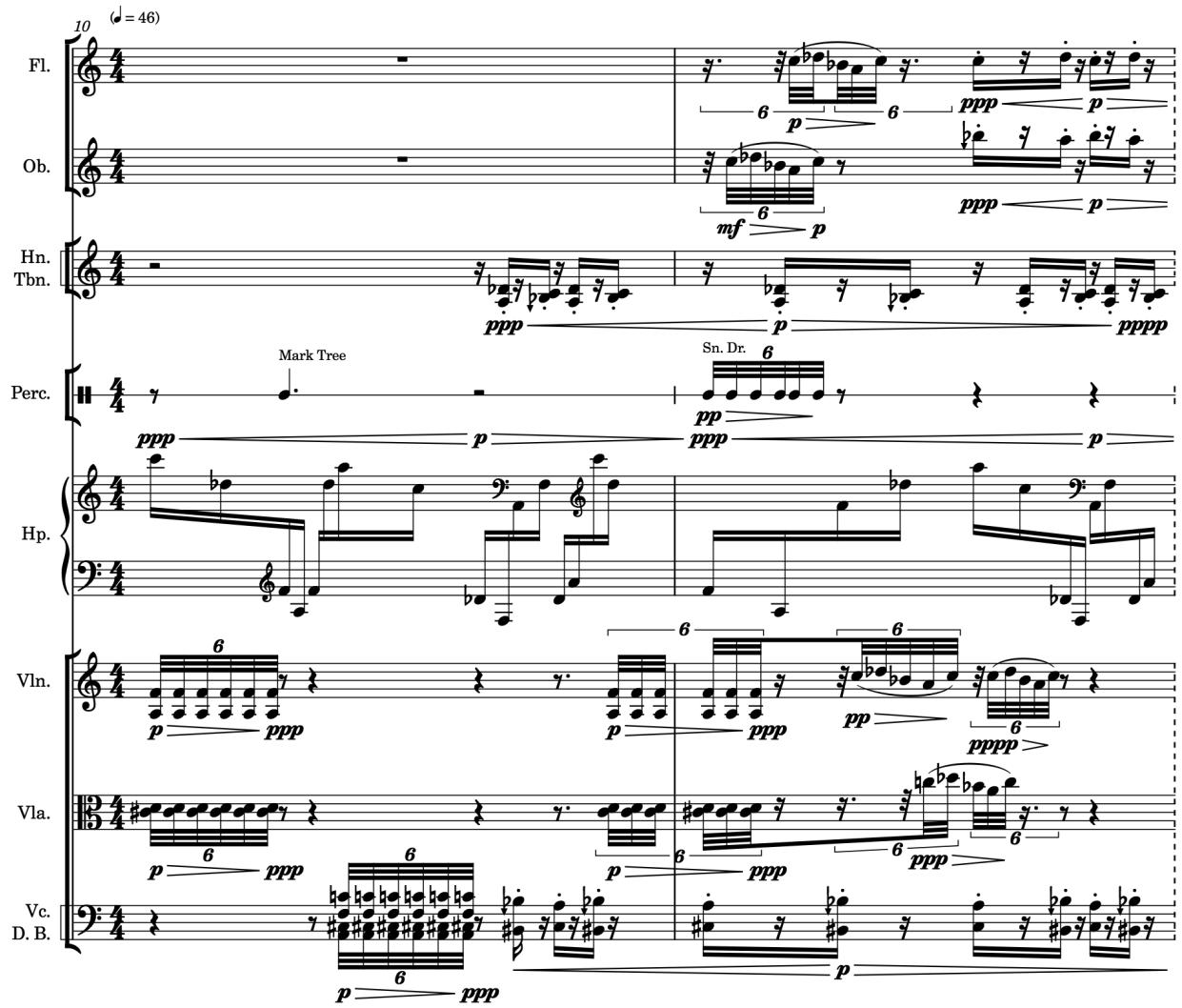
The passage discussed in Example 3.2 shows a case of narrative that arises from the musical elements themselves. The theme consists of four phrases of four bars each, constructed in such a way that all of them have more or less the same expressive intensity. This results in the first part of the theme being somewhat uniform and lacking the typically expected climax.



Example 3.6: Gervasoni, Piano Concerto, 4th mov., b. 42-57 (piano part)

Just as in orchestration, in which the withdrawal of a timbre for a period of time emphasizes its reappearance, the suppression of a certain type of harmonic colour in the structure of a piece can reinvigorate its return. Therefore, the interlude already discussed in section 3.1 was introduced not only to create ambiguity but also to momentarily change the way the harmony sounds, giving strength to the reappearance of the preceding harmonic colour and thus contributing to the establishment of a climax, which highlights the ternary form of the first theme.

We don't have to limit ourselves to thinking of narrative as something that arises from the presentation of events in a sequential way. It can also appear in events that occur simultaneously. Figure 2 of my piece 'The Spirits of Cahuachi', already cited in Example 2.16 and repeated here for convenience, divides the harmonic macrostructure—the aggregate—into different subsets to give each element a distinctive sound.



Example 3.7: Gervasoni, The Spirits of Cahuachi, fig. 2

The first harmonic field in this example is made up of the harp and the strings, which play with set 4-19—the minor-augmented tetrachord—,the harp by means of a constant arpeggio, the strings by nervous sextuplets that appear discontinuously. The second harmonic field is formed by the sextuplets played in strict imitation by the flute and oboe using set 4-3, a non-invertible set of two minor seconds and one major. Finally, the third field combines set 3-7—an incomplete minor-seventh chord—with a quarter tone (a type of event that is outside of Forte's classification) and is presented as a kind of 'ticking motif'

that jumps between the low strings, the brass and the woodwinds.

Each of these fields has a different harmonic colour which contributes to the character of their independent narratives: continuous on the harp, erratic on the strings and woodwinds sextuplets, pulsating on the ticking motif. The combination of these three narratives creates a broader and, of course, ambiguous one, since all of them have more or less the same degree of participation. Also, their superimposition gives rise to a larger harmonic field formed by set 6-z24, a subset of the harmonic-minor mode (the Spanish gypsy scale), and a quarter tone.

Chapter Four

Flow

This chapter deals with the flow of harmony in a composition. As a composer, I find the idea of flow very interesting. I tend to think of the flow of musical events in my works and perhaps even occasionally discuss it with other colleagues, but the concept seems rarely discussed in music literature.

The Cambridge Dictionary defines flow as 'the movement of something in one direction.' That same definition is applied here to refer to the flow of harmonic constructions, such as polychords and sets, throughout a piece.

For the present discussion, I looked for general ways to analyse different types of flows and found some useful categories in the field of fluid mechanics that can help with definitions and concepts of musical flow. These include, in particular, flow types such as uniform/non-uniform and steady/unsteady. However, before discussing these categories, I'll start by simply showing examples of harmonic flow in my music and some interesting conclusions derived from their analysis.

4.1 Harmonic Flow

The following example has already been discussed in Chapter Two, section 9 (Polychords: Density & Tension). This second table shows how many beats each polychord is held for in that passage.

Chord	Bar	Beats
R6(9)	20	16
R6(7)	24	16
R20(7)	28	8
R9(5)	30	8
R16(7)	32	8
R6(6)	34	8
S6(1)	36	4
R6(5)	37	4
R7(6)	38	2
R9(2)	38, 3rd beat	2
S16(5)	39	2
R6(11)	39, 3rd beat	2
R21(1)	40	16

Table 4.1: Gervasoni, Piano Concerto, 3rd mov., b. 20-40, harmonic flow

I wanted this section of the piece to act as a slow climb towards the climax so I thought it was crucial to carefully control the duration of each chord. First, I established a base, a point from which to ascend. Therefore, I held the first two chords for 16 beats each and, to make the passage more stable, I made them the same chord but with different

transpositions.

The ascent begins at bar 32, coinciding with a decrescendo from mezzoforte to quadruple pianissimo. From there, the flow of harmonic changes undergoes progressive acceleration, going from 8 beats to 4 beats and finally to 2 beats. At bar 40 we reach the summit. The harmony stabilises and a single polychord is maintained again for 16 beats.

All of this suggests that a flow of polychords can be set up similarly to a flow of triads and this is true to some extent, but there are differences, as we've seen in Chapter Two. For instance, multiple inversions of a single polychord can be used to create a passage with great harmonic variety, something that cannot be achieved with common triads, and this is precisely what happens in this example, in particular, in the long sections with a single polychord.[1]

A similar example, but with sets, occurs in Figure 4 of 'Northern Landscapes' (Example 2.15). First, set 6-32 is held for 29 beats. Then, at bar 80, the C and F become sharp, changing the set to 6-z25, which lasts for 15 beats (almost half the previous length). Then after 7 beats (half the duration again), A is changed to B, thus producing the inversion of set 6-z25. This shows an acceleration in the flow of harmonic changes. In the following bars, the flow decelerates although not in such a linear way.

As mentioned in the previous chapter, the first theme of my piano concerto's fourth movement is divided into three parts: a theme, an interlude, and a brief reappearance of a fragment of the theme. The following table shows the polychords used in each part:

[1]This property of polychords, of producing great harmonic variety through successive inversions, can be related to the concepts of weak and strong progressions. Compared to simple triads or four note chords, polychord inversions are able to produce enough contrast that they are not perceived as weak progressions, but, in my opinion, still far from being perceived as strong progressions. This places them somewhere in between the two and makes them capable of adding variety without interrupting the harmonic flow.

Theme 1	Interlude	Theme 1 (frag.)
R21, R9, S12	R1	R21, R9, S12 (R1, R2)

Table 4.2: Gervasoni, Piano Concerto, 4th mov., first theme harmonic flow

Interestingly, all polychords have a similar interval content but, as will be discussed in more detail below, they are perceived differently. The polychord in the interlude, differs more in interval content from the others in this regard, so its introduction feels like a stronger harmonic change. The same is perceived, but in reverse, when the theme returns. In this way, the flow of harmonic changes helps to emphasize the ternary form of the first theme.

From a general perspective, being a piece conceived mainly with polychords, only the three categories in which I have organised them are relevant for the analysis but in several sections of this movement (introduction, 2nd theme, coda) I used a harmony based on sets instead of polychords. Since set is a more general concept than polychord, my first attempt was to analyse the harmonic flow from that point of view. However, all my efforts to draw meaningful conclusions from this analysis were in vain, as the interval content of all the sets involved is quite similar. It seemed that the form of the piece, from its top level, was not very accentuated by the harmony, but I knew this was not true because I could perceive those harmonic changes when I wrote the music.

Here I should point out that the method I chose to analyse the piece differs from the way I wrote it, which was quite intuitive. I felt my way through the piece, so to speak, using various polychords and sets, but without thoroughly analysing what I was doing from a larger perspective.

I needed a structure-based analysis that takes into account that the order in which we hear a group of pitches and their frequency within a certain time frame affects the way

we perceive the relationships between those pitches. In this sense, an analysis based on sets is of little use since a set is, by definition, an unordered collection of pitches. Therefore, to study this piece I chose a different type of analysis, one based on modes.

As mentioned above, the first theme has a tendency to the Lydian mode, while the second theme sounds more like Phrygian. At the same time, the introduction leans towards Aeolian and the coda alternates between the latter and Mixolydian. Thus, we find a new type of flow: one of modes, which emphasizes the divisions in the structure and helps to give more definition to the form.

Intro	Theme 1	Theme 2	Theme 1	Theme 2	X	Intro	Coda
Aeolian	Lydian	Phrygian	Lydian	Phrygian	Lydian	Aeolian	Mixolydian Aeolian

Table 4.3: Gervasoni, Piano Concerto, 4th mov., modal analysis

The section called X corresponds to the repetition of the climax of the previous movement, a distortion in the shape of the piece that is intended to create a sudden break in the flow of ideas. It is also one of the most intense climaxes of this movement, the second one located on the final bar.

To analyse this flow of modes I used a pitch counting plugin in Sibelius and combined it with my internal perception of harmonic colour to determine the length of the different regions in the piece, resulting in the following table:

Chord	Bar	Beats
Intro	23.5	Aeolian
	5.5	Lydian
	8	Aeolian

Continuation of Table 4.4		
Section	No. of Bars	Mode
Theme 1	4	Lydian
	4	Dorian
	4	Lydian
	4	Aeolian
Interlude	12	Phrygian
Theme 1 (var.)	2	Lydian
	2	Aeolian
Theme 2	18	Phrygian
Transition	16	Chromatic
Theme 1	4	Lydian
	4	Dorian
Interlude	7	Phrygian
Theme 2	8	Phrygian
Transition	8	Chromatic
X	8	Lydian
Intro (var.)	13	Aeolian
Coda	34	Mixolydian
		Aeolian

Table 4.4: Gervasoni, Piano Concerto, 4th mov., harmonic flow

It is interesting to note that the interlude after the first theme uses the same mode as the second theme, which makes it easy for the latter to appear suddenly in the second part of the piece and be felt as if it has been prepared. Furthermore, the coda, like the introduction, also uses the Aeolian mode, which combines with Mixolydian, and both have a similar length,

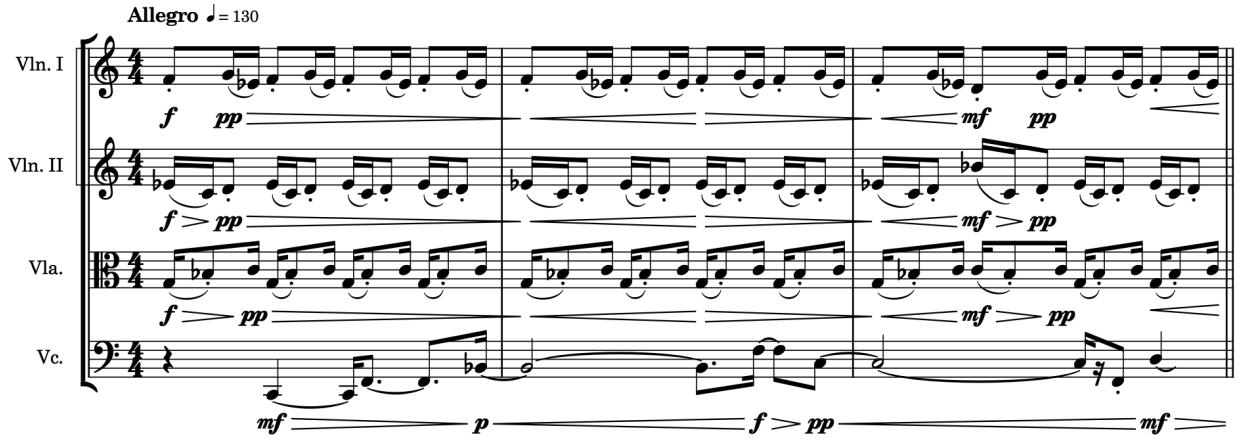
a symmetrical feature that counteracts the asymmetry of the thematic sections.

In relation to the harmonic flow, the table shows how in the second part of the piece each section lasts approximately half of its previous duration. If we could set a 'tempo' for this flow of modes, we could say that on the second part of the piece it almost doubles. This acceleration of harmonic changes, which is linked to the compression of thematic materials, helps to emphasize the sudden appearance of the section borrowed from the third movement.

4.2 Uniform/Non-Uniform

Now I will move on to the categories that were mentioned at the beginning of this chapter. The Merriam-Webster Dictionary defines uniform as 'presenting an unvaried appearance of surface, pattern, or color.' [sic] In reference to harmonic flow, this amounts to stasis, in other words, a fixed harmony over a long period of time. Its opposite, non-uniform, describes a changing harmony. In the latter case, the flow can also be steady or unsteady, as we'll see later.

We find an example of this type of flow in the opening bars of my piece 'Northern Landscapes', which were discussed earlier, in Example 2.14, repeated here for convenience.

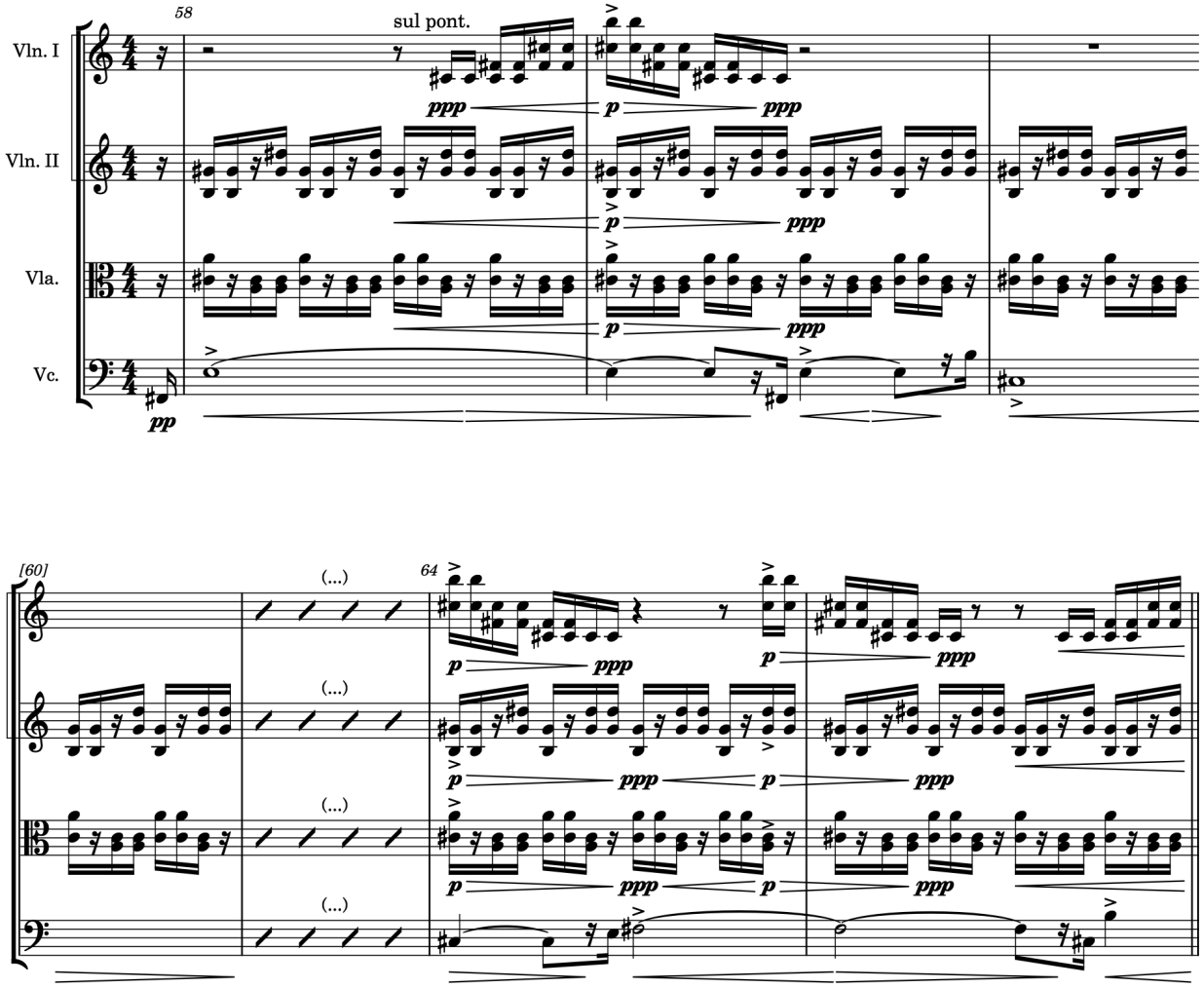


Example 4.1: Gervasoni, Northern Landscapes, beginning

The violins and the viola play different recurrent motifs. They are all part of a single unit: the moving cluster, which presents set 6-32 (the diatonic hexachord) on B-flat at each beat, thus establishing a uniform flow.

In contrast to them, the cello plays isolated pitches in a much slower flow, with only three pitches in the first few bars and then gradually introducing the rest. In a melodic line devoid of motifs, each individual pitch becomes a significant element, so a slower flow is needed to create a sense of progression. There is no regularity in this flow of pitches (not even in the durations or positions) so we must consider it as a non-uniform flow.

We can also find an example of uniform/non-uniform flow in bars 58 to 66:



Example 4.2: Gervasoni, Northern Landscapes, b. 58-65

Here the second violin and viola are responsible for the texture, which, although it has its origin in the idea of the moving cluster, is now based on the alternation of two chords. The rhythmic patterns also alternate on each instrument between two configurations but from a distant perspective, the texture appears uniform and actually sounds like this. At the same time, two additional layers to the texture are superimposed: a variation of the isolated pitches on the cello, and erratic bursts of semiquavers on the first violin.

The sum of all the parts creates a non-uniform harmonic flow. The texture plays with

two sets: 4-11 (a cluster formed by the first tetrachord of the Lydian mode) and 4-25, the French sixth. However, both alternate so fast that they blend into a single harmonic entity: set 5-24 (the first five notes of the Phrygian mode) which is changed to 6-33 (the first six notes of the Dorian mode) when the first violin is integrated. The cello plays many of the same pitches but adds the E, producing set 7-35: the diatonic scale (a specific mode is hard to pin down, although it seems like Aeolian). All of these trends move the harmony in one direction or another through a non-uniform flow of change, sometimes towards set 7-35 (e.g. bars 58-59), sometimes towards set 5-24 (e.g. bar 60) and other times towards set 6-33 (e.g. bar 65), thus producing a very ambiguous passage, from a harmonic point of view, that is not only interesting and exciting for me as a composer, but also adjusts to what the piece intends to communicate, which is the representation of a series of images or landscapes that we pass through.

Other sections of the piece play with the idea of simultaneous flows in different combinations of instruments, such as the third section, in which the opposition between a uniform texture and a non-uniform flow of isolated pitches is 2 to 2 instead of 3 to 1, while some, like the fifth section, already shown in Example 2.15, show a more linear progression, with all the instruments participating together in creating a non-uniform harmonic flow.

4.3 Steady/Unsteady

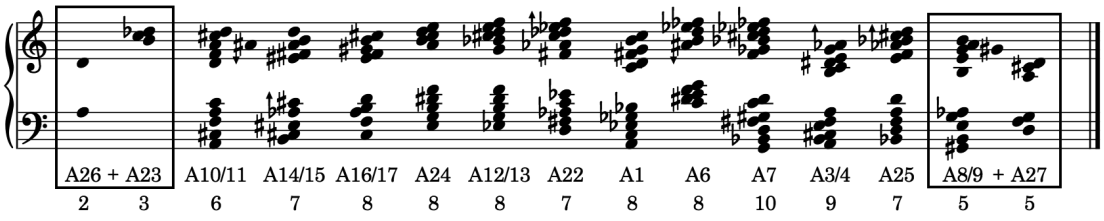
A flow can also be steady/unsteady. The Cambridge Dictionary defines steady as 'happening at a gradual, regular rate.' With respect to harmonic flow, this refers to introducing changes in the harmony on a regular basis. Its opposite, unsteady, changes the harmony at irregular intervals of time.[2]

[2]In the context of complex harmonic structures, the use of a steady versus an unsteady flow may be of little importance from the listener's perspective, as they are difficult to differentiate, but as a composer I

There is an example of a steady flow in my piano concerto, as we've seen in Table 4.4. This type of flow is a characteristic of the first theme—which is also an example of non-uniform flow—as it changes its harmonic colour at a regular rate. All of this differentiates the first theme from the second, which has a uniform flow and therefore displays only one colour. I used this as a way to create contrast between the two and it is also related to the poem that inspires the movement, since the first theme corresponds to sections of great literary variety while the second theme relates to others mostly focused on the subject of winds and storms.

As for an unsteady flow type, we've also seen one at the end of the previous section, in bars 58 to 65 of 'Northern Landscapes', where the harmonic flow is not only non-uniform but also unsteady.

In my piece 'The Spirits of Cahuachi', different types of flows can be seen from different perspectives. The diagram below shows the aggregates and the order in which they were used.



Example 4.3: Gervasoni, The Spirits of Cahuachi, General Plan

The aggregates have been labeled with the numbers of the antaras that form them. A slash is used for antaras of identical pitch content and a plus sign indicates that two antaras with different pitch contents have been merged into a single aggregate. The pitches

am interested in studying them, as it is important for me to find ways to justify one or the other within my compositional process.

have been transcribed in their original octave. The numbers on the second line indicate the number of pitches in each aggregate. Since each section uses only one aggregate (or sum of aggregates, in the case of the first and last), we can say that all of them are independently uniform from a macro perspective.

Viewed as a whole, the piece has a non-uniform and an unsteady flow, as can be seen in the following table, which shows the duration of each section in number of crotchets.

Section	Crotchets
A26+A23	28
A10/11	22
A14/15	8
A16/17	15
A24	21
A12/13	33
A22	36
A1	16
A6	20
A7	19
A3/4	8
A25	16
A8/9+A27	28

Table 4.5: Gervasoni, The Spirits of Cahuachi, harmonic flow

Looking closely at the table, there is an interesting feature in the flow: the last five durations are very similar to the first five but in reverse.

First 5 Sections	28	22	8	15	21
Last 5 Sections in Reverse	28	16	8	19	20

Table 4.6: Gervasoni, The Spirits of Cahuachi, length comparison of first five and last five sections

Although unintentional, this characteristic affects the harmonic flow of the piece and therefore its form. Conversely, the order of the aggregates was totally intentional and the objective was to organise them in an arc of densities, with the aggregate of higher density, A7, occurring approximately two-thirds of the way through and reserved for the climax of the piece.

The use of non-uniform and unsteady flows in 'The Spirits of Cahuachi' is partly related to the variety of the musical materials with which I worked, that is, the pitch collections of the antaras. I felt that an irregular flow was more appropriate than a regular one due to the richness of the harmonic materials and the approach taken in their organisation. However, this harmonic flow is different from that of the piano concerto in that the segments into which the aggregates were divided are almost always kept separated by characteristics such as timbre, register and motifs, in a concept already defined as 'harmonic field'. All of this was in keeping with the expressive aim of the composition, which was to suggest a mystical and mysterious atmosphere; as mystical and mysterious as it is for us the role that these antaras must have had in the rituals of the Nasca people.

Finally, it is necessary to observe that the harmony of this piece has been discussed from the point of view of its design, of its vertical and horizontal organisations, but this approach is valid only for analysis. It is not possible to guarantee that the harmonic flow will actually be perceived during the listening process, but this is not important as what

will most certainly be perceived is the overlapping of conflicting harmonic elements, which, as mentioned before, is related to the goal of the piece and is also the main subject of this commentary.

Chapter Five

Conclusions

I began my study with the intention of discovering the potential of polychords as building blocks of harmonic development in music. This is not the first time that I have established a priori the basic harmonic components of a composition. I have done this before in a number of works. However, it is the first time that I categorise them to create a colour palette from which I can objectively choose the ones that I feel best meet my expressive needs.

After creating the category lists, based on my perception of the harmonic colour of these building blocks, I thought the path was paved and the only thing left was to use them. I couldn't have been more wrong. I soon noticed some blind spots in my initial assessment of their potential and was forced to broaden my point of view. This is how the concepts of sets and aggregates also became part of my study.

Each new bar presented additional questions that I was forced to resolve. The need for harmonic flexibility, for example, led me first to temporarily suspend the use of polychords in the second movement of my piano concerto and then to also consider the possibility of incorporating pitches not present in the proposed harmony, in the third movement. Outside of the field of harmony, a region no less important, I found interesting challenges when considering the need for a certain virtuosity in the piano concerto. The need for fluidity of

ideas in all the pieces was also constantly on my mind.

As I said, it was interesting to discover the weaknesses of polychordal thinking, to realise that they must be combined with other approaches to provide an optimal result. It was equally interesting to realise that Set Theory analysis in music has its limitations and that the harmonic colour of a set of pitches cannot be explained only by their interval relationships (i.e. the interval vector), but must also take into account our auditory perception.

From the point of view of expression, it was fascinating to see how harmonic ambiguity can arise from some very rational decisions based on poetic texts. Also, while not a new finding, it was good to rediscover that character cannot be determined by harmony alone and that the intervention of other musical variables can smooth out harmonic tension.

The study of the flow of harmonic changes in my pieces has been equally rewarding. So far I have approached this aspect of music in a totally subjective way, but now it has become something that I want to control more consciously in my next works.

All of the above has certainly broadened my vision and my vocabulary, and I now have a new set of tools, as well as some interesting ideas on the development of harmony in the context of complex constructions, such as polychords and aggregates.

I'm particularly interested in the possibilities opened up by the third movement of my piano concerto, the final sound of which I could not anticipate—even after completing the draft as a piano reduction—and has become something of a revelation to me.

I have made equally interesting finds in the chamber works. The concept of moving clusters, while not new to Western musical development, is certainly new to my language. I was also very interested in finding out what kind of piece would come out of the arbitrary preorder of the pitch aggregates in 'The Spirits of Cahuachi' as well as finding ways to efficiently integrate the quarter tones into the harmony. I'm very pleased with the result and

will certainly return to this approach in future compositions.

Despite covering more than 30 minutes of music, I cannot consider the works included in the portfolio as comprehensive examples of the possibilities offered by the use of the studied materials. There are still ideas that could be developed further and some new pathways to explore. Rather than seeing this as the end of my findings on these forms of harmonic development, I consider that there is great scope to advance and expand polychordal thinking in conjunction with other types of groupings.

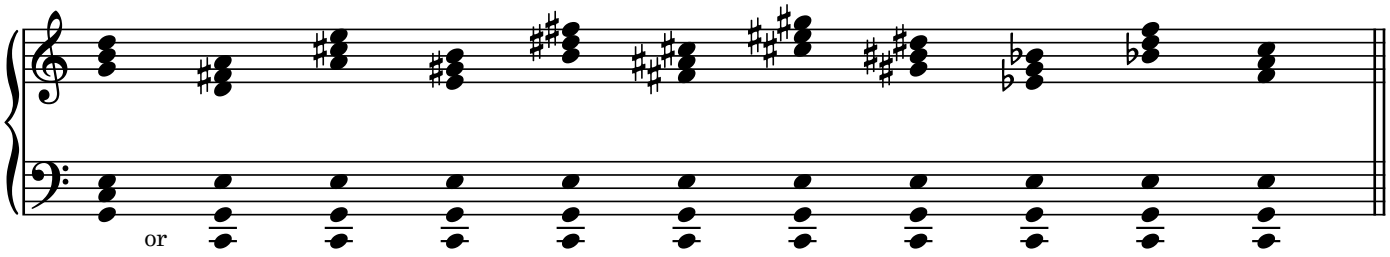
Appendix One

Polychord Book

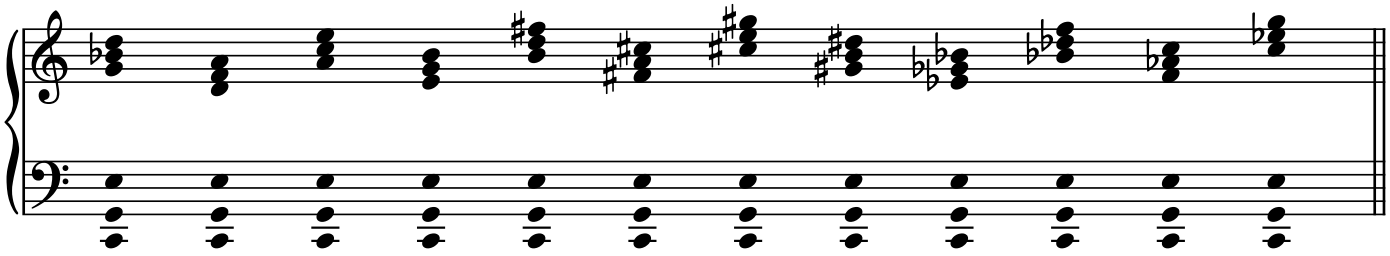
Polychord Book

1. Polychords: Two Triadic Units

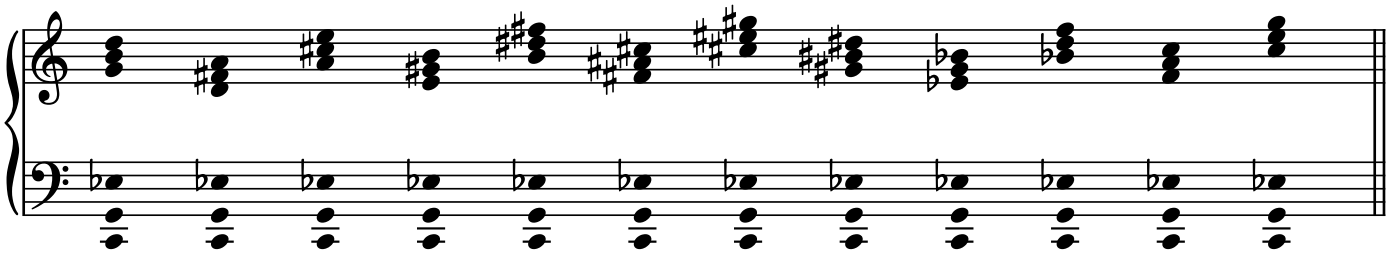
M | M



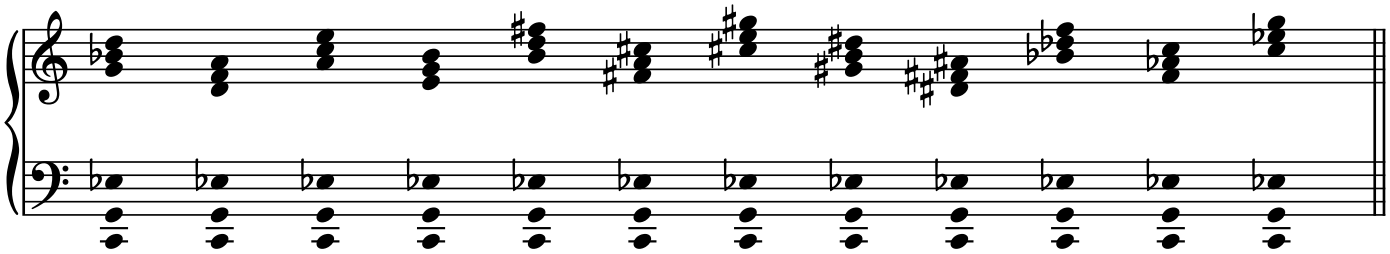
M | mi



mi | M

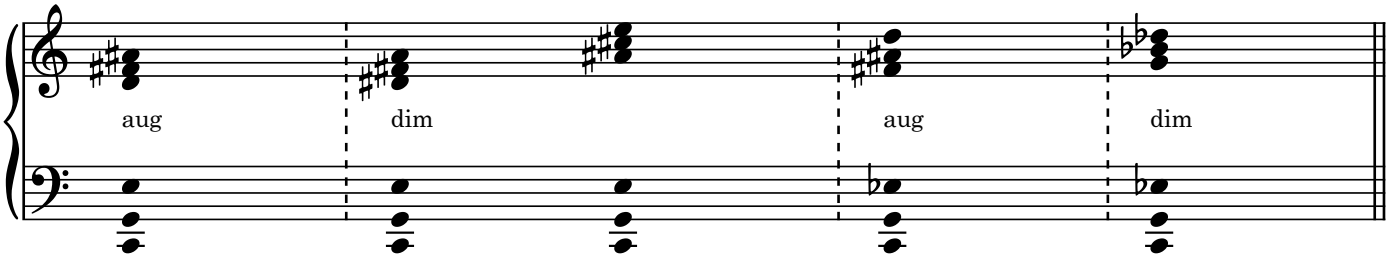


mi | mi

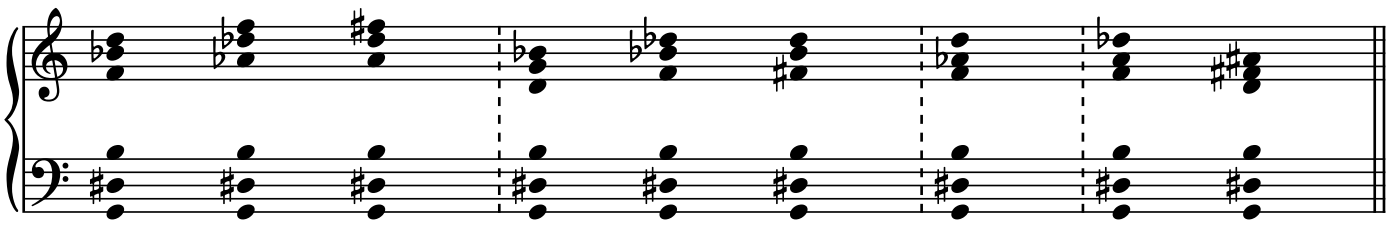


Polychords: Two Triadic Units

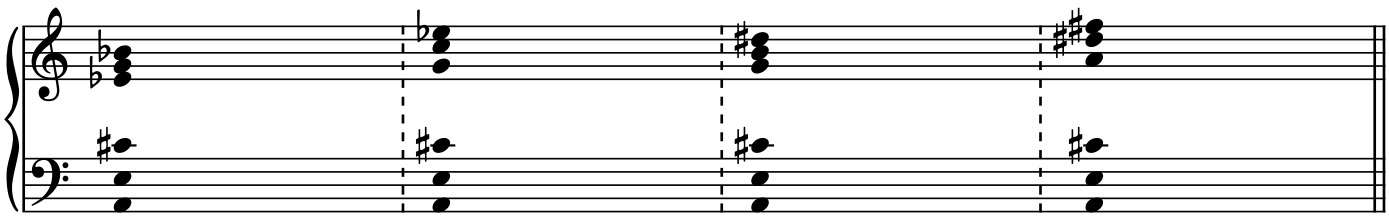
M | aug/dim



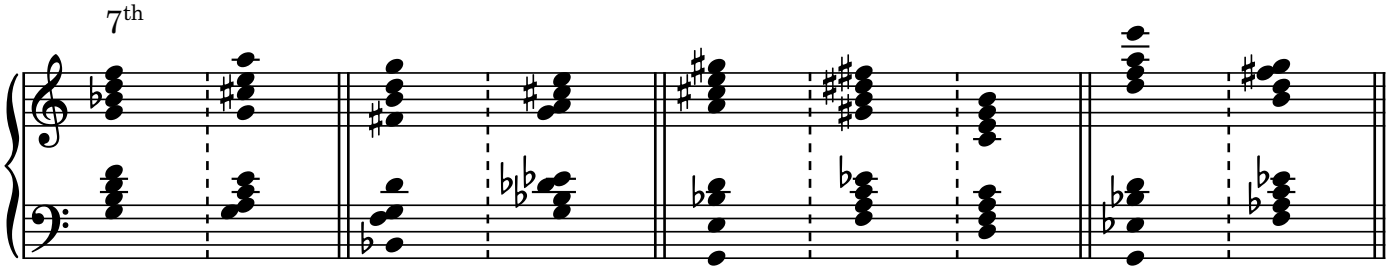
aug | M aug | mi aug | dim aug | aug



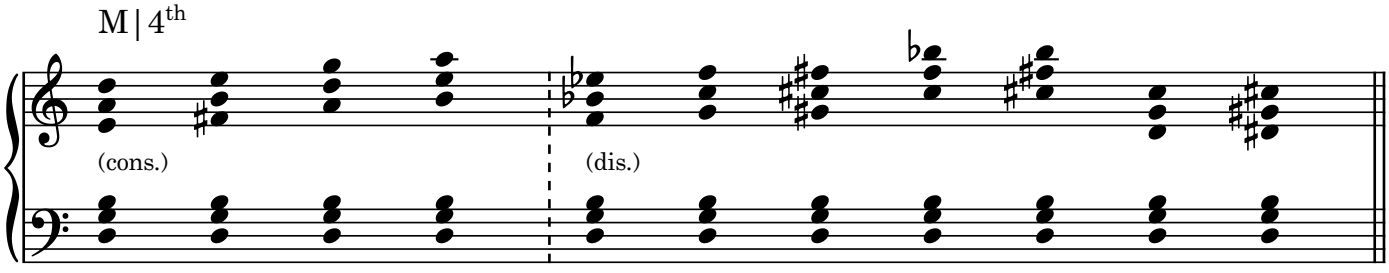
dim | M dim | mi dim | aug dim | dim



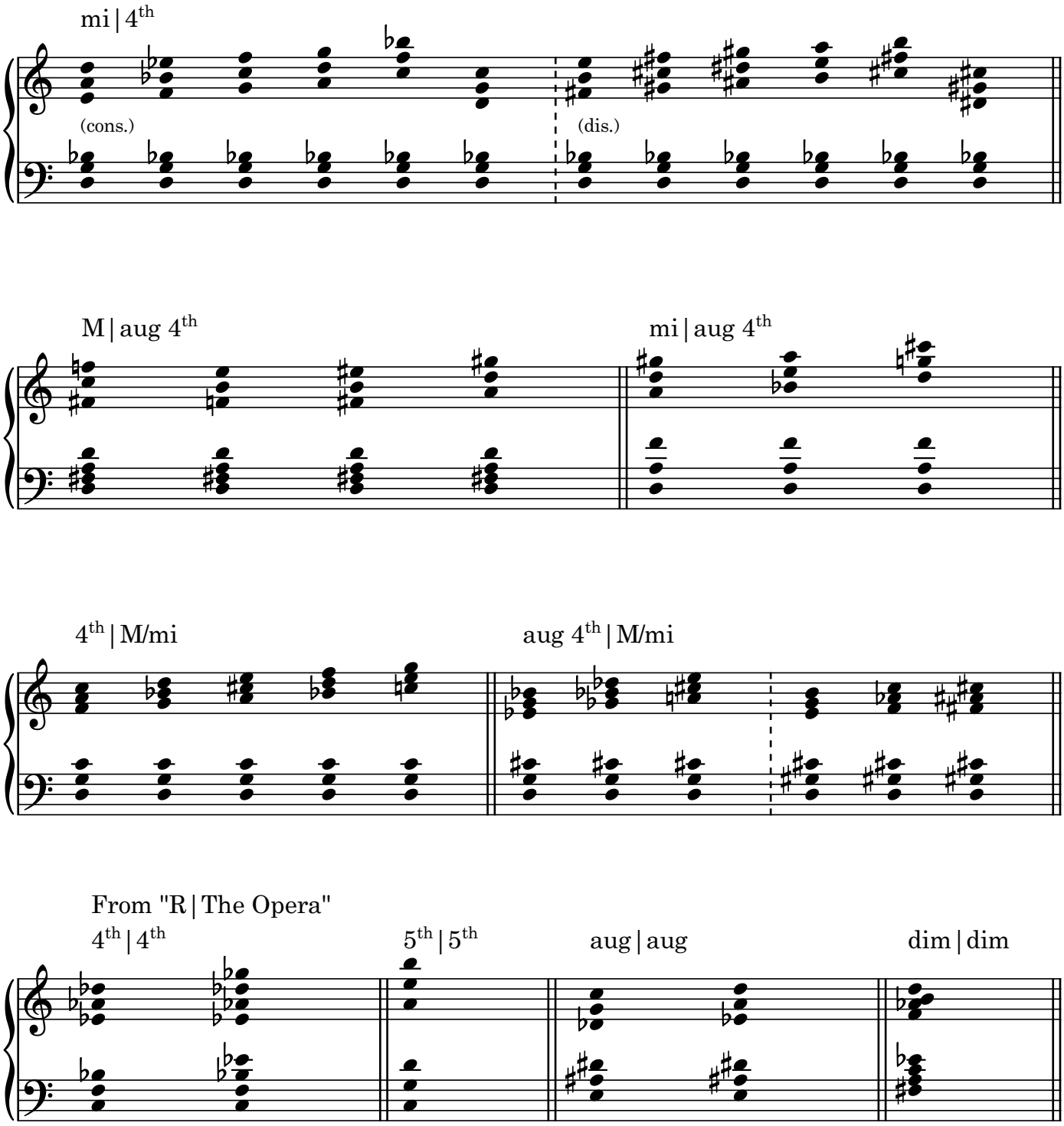
7th



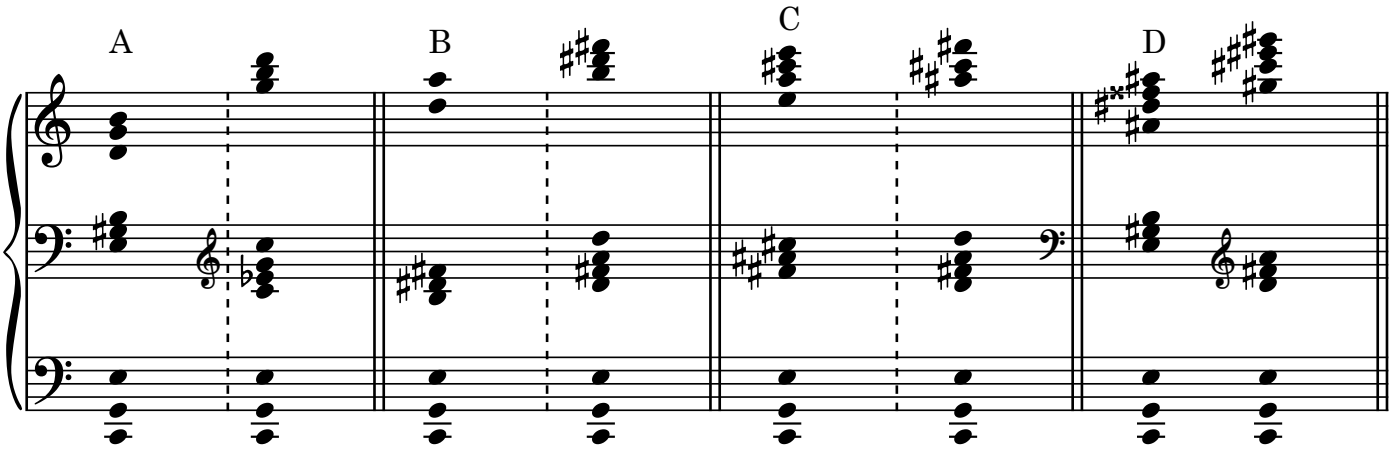
M | 4th



Polychords: Two Triadic Units



2. Polychords: Three Triadic Units



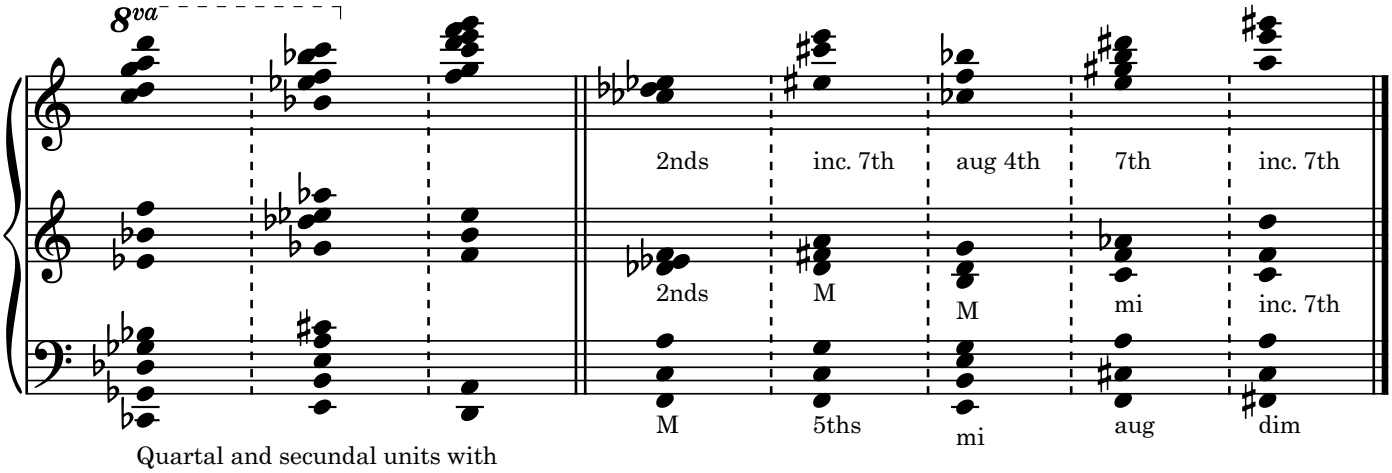
Built on the 3rd, 5th and root of the bottom triad

Built on overtones of the 3rd and 5th of the bottom triad

Built on overtones of the overtones of 3rd and 5th of the bottom triad

Built on overtones of the root, 3rd and 5th of triads other than the bottom one

Other Polychordal Combinations



Quartal and secundal units with triads by thirds

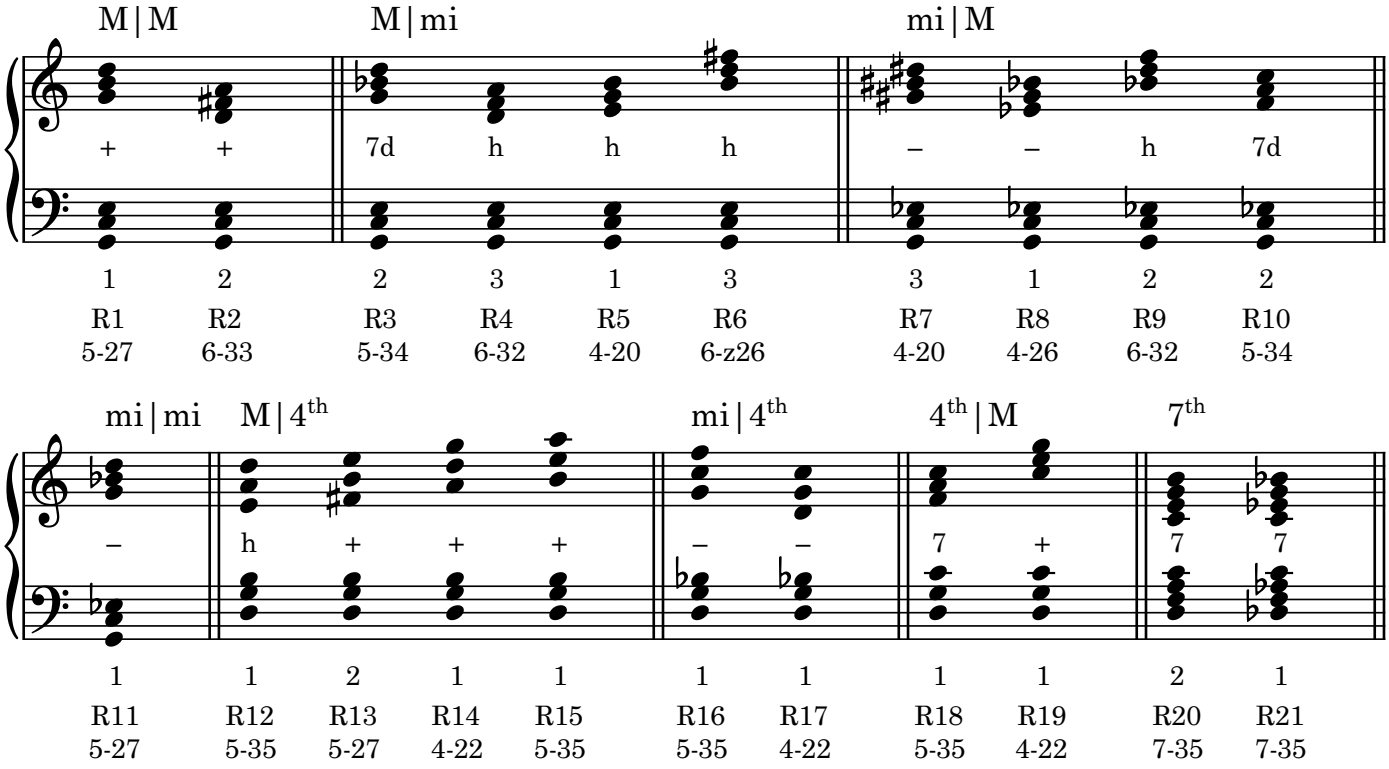
Appendix Two

Usable Polychords and Their Character

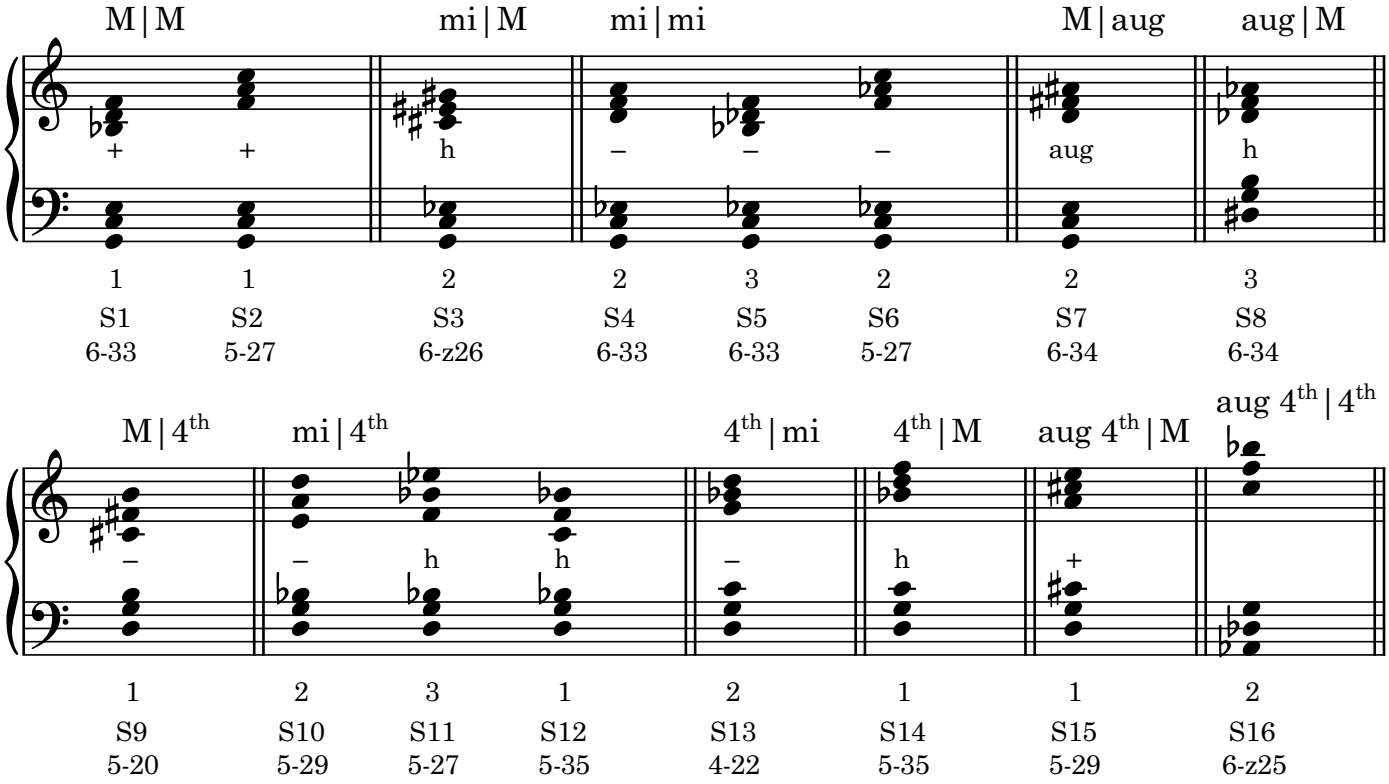
Usable Polychords and Their Character

Antonio Gervasoni

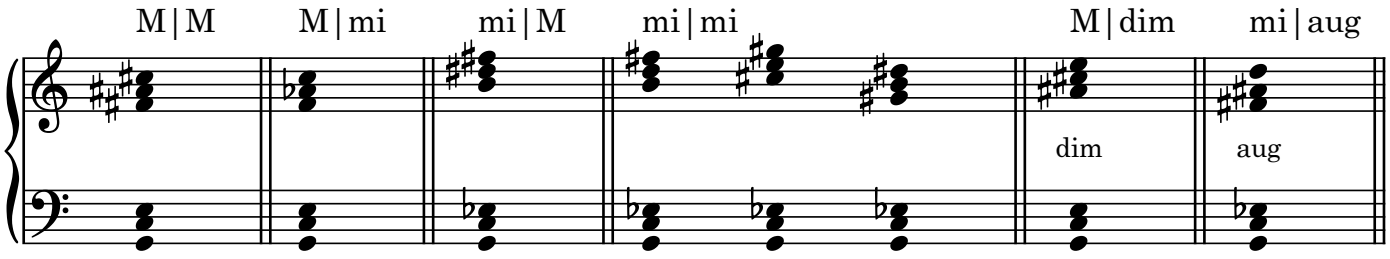
1. Relaxed



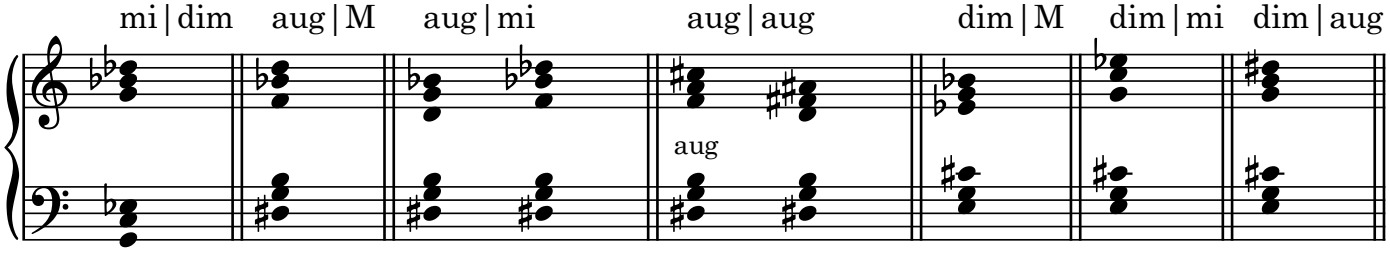
2. Spicy



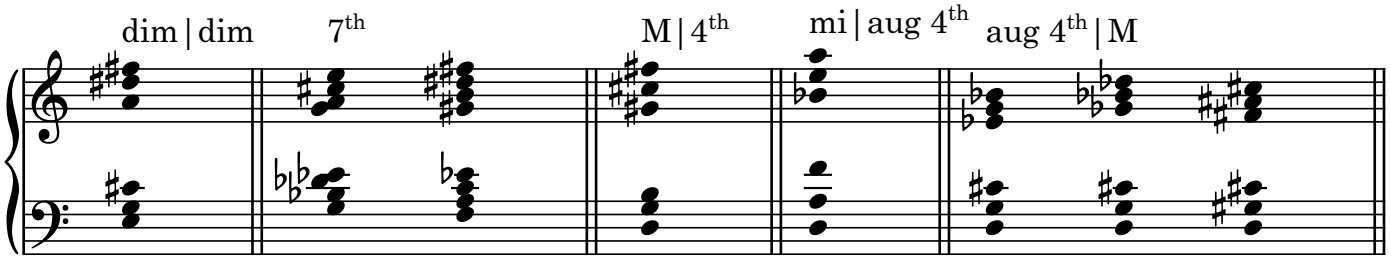
3. Tense



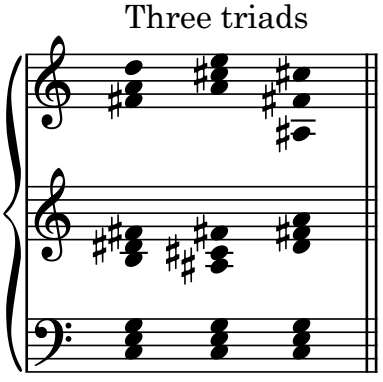
1	1	2	3	1	3	1	3
T1	T2	T3	T4	T5	T6	T7	T8
6-30	5-z17	5-22	6-z19	6-z19	5-21	5-31	6-31



3	3	3	3	2	2	2	3	2
T9	T10	T11	T12	T13	T14	T15	T16	T17
5-25	6-31	5-21	6-34	6-35	6-20	5-31	5-16	5-26



1	3	3	1	1	2	3	3
T18	T19	T20	T21	T22	T23	T24	T25
6-z23	6-30	7-31	6-18	5-20	5-z38	5-22	5-30



3	3	3
T26	T27	T28
8-26	7-31	8-27

References

Meyer, Leonard B (1961). *Emotion and meaning in music*. University of Chicago Press.

Neruda, Pablo (2017). *Veinte poemas de amor y una canción desesperada*. Ediciones Cátedra.

Persichetti, Vincent (1961). *Twentieth century harmony*. WW Norton New York.

Petrozzi, Clara (2010). "Identidades en la música peruana del cambio de milenio. El caso circomper". In: *Cuadernos de Música, Artes Visuales y Artes Escénicas*.

Rae, Charles Bodman (2012). *The music of Lutosławski*. Bobcat Books.

Rosen, Charles (2010). *Music and Sentiment*. Yale University Press.

Ross, Alex (2012). *The rest is noise: Listening to the twentieth century*. HarperCollins Publishers.

Rowell, Lewis Eugene (1983). *Thinking about music*. University of Massachusetts Press Amherst.

Sloboda, John A (1986). *The musical mind: The cognitive psychology of music*. Oxford University Press.

Vergés, Lluis (2007). *El lenguaje de la armonía de los inicios a la actualidad*. Editorial de Música Boileau.

NOTE: Quotes from entries in Spanish have been translated by the author of this commentary