

Some Aspects of a Preliminary Analysis of Argumentation in Western Tonal Music

Patrick Saint-Dizier¹

Abstract. In this paper we present some aspects of argumentation as it is realized in a non-verbal system: western tonal music. We show via examples (Bach's organ Passacaglia and Beethoven's piano sonatas) that argumentation is very much developed in music, but very abstract, leaving space for various interpretations. We investigate the means used by these two composers and analyze their psychological impact on the mental state of the listener.

1 Introduction

It may seem at first glance that music has limited relation with argumentation. It is commonly admitted that arguments essentially have a language support with a clear contents, coming from either written documents (e.g. news) or oral communication (e.g. dialogue, political speech). Argumentation is a rational process whose goal is to convince someone of a certain statement or view. Nevertheless, non-verbal media, which may seem less rational, such as sound, images and video may also play a major role in argumentation.

The very preliminary analysis presented here originates from the fact that music is a natural, but very abstract, language, with a well-defined syntax for low level constructions (melody, harmony) as well as for high level constructions (musical rhetorics). The structure of a piece of music cannot be accounted for using the tools used in computational linguistics: any attempt to find close analogies would probably fail, but there are some principles which can be considered [3, 6].

Instead of developing their ideas and feelings via language, composers used the means offered by music, via its emotional and symbolic dimensions, to characterize mental states, which originate from both melodies and harmony but also from its very structure. A number of composers had internal debates about essential points in their lives, which can be very clearly identified as arguments. These arguments can get a very strong emotional strength, rarely reached in language. These emotional states can then lead to rational attitudes.

The work we present here remains largely exploratory. Considering a well-identified period of musical production (western tonal music), we aim at elaborating a model that accounts for the means developed by composers to develop arguments, argumentation and the associated rhetorical relations. Identifying and modelling these means is a useful challenge and an interesting extension to argumentation analysis and development. It is also a set of means which could be re-used in concrete communication situations. In parallel with the linguistic (semantics and pragmatics) aspects of argumentation and related schemes (e.g. [9]), which are now relatively well developed, we argue that it is possible and of interest to investigate more abstract

modes or psychological approaches that give a more comprehensive and global analysis to argumentation.

The relations between music and language and reasoning have not been much investigated. Let us note the very insightful investigation of Generative Theory applied to music production [1, 3], which essentially addresses syntactic aspects. To the best of our knowledge, no work has been carried out to model the rhetoric and argumentation aspects of music following the analysis principles applied to language. There is a relatively abundant literature on musical rhetorics, but oriented towards musical analysis or production, which serves very different aims.

2 Music as a science of numbers and proportions

Music is basically a science based on numbers and proportions. Pythagoras was probably the first, in our western world, to initiate this view, with the well-known definition *music are numbers made audible*. Till the Renaissance, music was part of the *Quadrivium* together with geometry, arithmetics and astronomy. Saint Augustine (in the confessions and *De Musica*) and Boece (470-525, in the consolation) justify that music is a science, with rational knowledge based on numbers, that manages the harmony of movements. Roughly, music is not only a mathematical object that accounts for harmony and rhythm, but it is also a form of abstraction, with a strong explicative power, that reflects creativity and perfection. The Medieval period developed a very strong view of music via a metaphysics of sound organization: music becomes a part of theology. In the Gregorian song, music is viewed as a 'perfect sound with a unified view of body movements, pitch, metrics and text', it is an art of the orator (*jubilus*).

From the Renaissance, music was associated with a more analytical vision, with, among others, the following major points of investigations:

- analysis of proportions and their 'psychological' effects, e.g.: proportions between notes (intervals in a melody), between durations, leading to rhythms.
- analysis of the facets of the tension-resolution mechanism in tonal harmony, which allows the introduction of contrasts,
- from the two points above points, development of polyphony techniques together with their symbolism and the analysis of their communicative dimension on the listeners, culminating in the late baroque period,
- analysis of the numerous types of metaphors introduced in the construction of melodies and in harmony: orientational (moving up is positive, moving down is negative), spatial (*ambitus*, distance between voices or notes, etc.) and metaphors based on colours

¹ IRIT-CNRS Toulouse France, email: stdizier@irit.fr

(keys and chords are associated with colours, modulations and sequences of chords draw colour undulations).

- development and analysis of musical structures and their underlying symbolism, with the emergence of typical forms (e.g. ricasar for scholarly music, forms of dance such as the minuet for more popular forms such as ternary forms) and techniques of thematic development. From these elements emerged a rhetorics of music, with a first stage culminating in the late-baroque with J. Mattheson treaty on musical rhetorics (circa 1722).

3 Argumentation in Tonal Music

3.1 Some epistemic considerations

In the examples below, we sketch some basic elements in musical discourse which are proper to argumentation:

- it is a system that uses all the means of the 'language' at stake: argumentation is not an abstract process. Arguments and argumentation are constructed from the means offered by the language: sounds, pitch, harmony, duration at a low level, and formation of themes, musical development and rhetorics at a higher level. The analysis of their effects on the listener is then a central issue.
- it is clearly a system designed for communication, where the speaker prevails.
- it is a form of interaction, which, given a question, presents various views or reactions, positive or negative. It is therefore capable of presenting contrastive views, in particular via theme elaboration, opposition between themes, and variation techniques.
- it is normalized and quite generic in the sense that it follows rules recognized by a certain group of listeners, in a certain context or historical period,
- it is figurative in the sense that it uses forms, largely symbolic, which have a clear impact on listeners with the goal to help him/her to deepen himself the initial question, with the help of the musical support.

To summarize, these points argue that music and musical structure are potential means that can support listeners internal debates about a question raised by the composer (or similar questions proper to the listener). Those means, while being symbolic, do define the main trends of a debate, its importance, its strength or even its violence. Musical elements can be extremely powerful in terms of persuasion.

3.2 The emergence of argumentation in tonal music

The period of tonal or modal music that is considered here starts roughly at the end of Renaissance or the early baroque (1600, with e.g. H. Schütz) till the dissolution of tonality into various systems in the early 20th century. In the next sections, we concentrate on the end of the 18th century and the beginning of the 19th century, where argumentation is the easiest to characterize in a few sentences. During the baroque period, ending 1750 (death of JS Bach), musical works were essentially constructed around a unique theme, which underwent a number of variations and amplifications. Even the most achieved form of the baroque period, the fuga, was constructed around a unique theme (or subject) with a response and one or more counter-subjects, but the root (or the head, in linguistic terms) remains the unique seed.

From J. Haydn works (sonatas, symphonies and string quartets) emerged the idea of the confrontation of two very different themes,

with very elaborated forms of symbolic contrasts or 'fights' between them. Although themes of a given musical work had major differences in rhythm, melody and harmony, these often had a lot of musical material in common. This is comparable to opposite views in language which also share a number of prerequisites, topics, etc. This preserves the cohesion of a debate.

This was the beginning of the 'Sturm und Drang' period where the authors' feelings dominated their musical production, in contrast with the baroque period which had more general purpose considerations (religion, ceremonies, etc.). This view, typical of the German and Austrian Romanticism, was initially developed by a number of authors, including Mozart, Schubert and Beethoven. Then, this confrontation became more shallow and more complex, with the emergence of cyclic themes in the late Romantic period (J. Brahms, C. Franck, G. Mahler, etc.). In this short article, to illustrate this point, we will concentrate on a few works by L. van Beethoven, which are readily accessible, and will make our approach more clear. It is interesting to note that, given a certain question or statement, related arguments are found in a number of different works, not a single piece like a sonata of a string quartet. Argumentation was indeed related to very foundational questions that Beethoven raised and which he elaborated over several years. We then developed a different view of argumentation from JS Bach's work.

4 Beethoven and his 'Muss es sein?' question

In Spring 1801, Beethoven, who had fragile health, felt the first effects of deafness. He also encountered a large number of personal difficulties, including financial. At that period, he seriously thought about committing suicide, as witnessed in the well-know *Heiligsstadt Testament* [4]. In this document, Beethoven raised essential questions about destiny in general, and how to behave: rebellion (and how) or acceptance. Beethoven was very close to several poets of that period (including Goethe, Schiller, Brentano and Eichendorff) who were very idealistic about society and people. Beethoven has always been a 'humanitarian idealist', following Kant's views: *the sky with stars above us, and morality in us*. All these aspects were of much interest to Beethoven and subject of several questions which were immediately transposed into his musical works.

Questions about destiny were the most crucial. These are often realized by means of very recurrent, powerful, if not brutal or violent, musical means [2]. Questions are followed by responses of very different natures, also based on quite recurrent musical means. Let us present here very briefly a few relevant examples taken from his piano sonatas.

Typical forms of questions appeared as early as 1801, in the **8th sonata** (op. 13, 'pathetic'). They all have approximately the same melodic profile and rhythm, that globally follow the natural intonation used in language. The introduction of the 8th sonata is abrupt and has the typical intonation profile of painful and doubtful questions: gradually ascending melody, minor mode, with a typical rhythm (example 1)²: long duration followed by a short one, repeated a number of times, in a quite obsessive way, quite typical of question intonation. After a climax (bar 4), the sequence goes on via an elaboration (bars 5 to 8), the question ends by a long descent (bars 9-10), anticipating the response. The main part of the first movement is then composed of a first theme in C minor which is very dynamic and abrupt, symbolizing fight to maintain this idealism in spite of the corruption of the society in which he had to live (and survive). It is

² Examples are given at the end of this paper. These score extracts are free of any reproduction rights, see <http://imslp.org/>

composed of 4 bars with an ascending melody staccato followed by a 4 bars descending melody with long values. The second theme, in A flat major tone, sounds like a folk song, it introduces a form of rest or relaxation which reinforces the strength of the first theme. The question appears again twice (4 bars long each time). The movement ends abruptly, with a portion of the first theme, unfinished, leaving little space for optimism.

The next major 'step' is **sonata nb. 23, op. 57** (Appassionata in F minor, a particularly 'dark' tonality). It was inspired from 'The Tempest' by Shakespeare with the opposition between young people undergoing a dramatic wreck (literally and metaphorically) and the wise Prospero. The question was again about destiny: acceptance or rebellion? The first movement starts by this question, with a melodic profile and a rhythm close to the op.13, but darker and more violent, and with more contrast between long and short durations, making the atmosphere very distressing (example 2). This first theme (bars 1 to 11) is followed by 2 variations (12 bars each), based on specific fragments of the theme. These variations are meant to reinforce the question, outlining its main features. The second theme (from bar 36), in A flat major, has the same rhythm, but develops a luminous melody, very enthusiastic (example 10). Via this theme, Beethoven expresses his faith in positive aspects of destiny leading to positive conclusions of his life (e.g. marriage with Josephine de Brunswick, which unfortunately never happened). These two themes, which seem so antagonistic, are based on the same rhythmic structure and melody, but with reversed orientations (called mirror in musical analysis) and opposite modes (minor versus relative major): the question with a very negative colour, and this very positive second theme realizes a symbolic form of an argumentation scheme. This movement concludes in a chaotic way, with thematic material borrowed to the two themes, in the lower, 'dark', part of the keyboard, leaving the listener with negative feelings about the initial question. The underlying, somewhat symbolic, message in this argumentation scheme is that it is difficult and painful to reach the positive conclusion: 'accept destiny', and that numerous difficulties and failures pave this way, as suggested by the music.

Due to a lack of space, we will not discuss the **sonata nb. 29** (Hammerklavier) which is a crucial step in Beethoven's production. The last works we want to briefly investigate here are the last two **sonatas, nb. 31 (op. 110) and 32 (op 111)**, composed around 1821. The question is raised in a very brutal way in the sonata nb. 32, with a global shape (example 3), once again, quite similar to the op. 13, which is about 20 years younger. In Sonata nb. 31, the question is raised by totally different means: a very slow and short sequence, in minor tone, a kind of *recitativo* as found in baroque cantatas, characterizing the emotional state associated with the question.

Let us now consider the responses. In the case of the sonata nb. 32, it is a set of variations in C major which roughly progresses in a way quite similar to the variations of the op. 57. From a relatively melodic and peaceful start (with incursions in A minor) the melody becomes more and more luminous. The initial rhythm of the question is now used as a support for a kind of folk dance (as in symphony nb. 7). The variations end by an extensive use of trills which have a symbolic role, that of liberation and of the evocation of Heaven and angels. The cycle of Beethoven's sonata therefore ends by a positive conclusion, after a number of arguments supporting the argument 'acceptance', based on different musical language means, opposed to others supporting 'revolt' found in previous works.

Sonata nb. 31 offers the same conclusion but more gradually, and with more symbolic means. After the question, there is an *arioso dolente*, very painful. Then starts a fuga, with a positive, ascending

theme (example 5). The fuga is in general felt to be the 'ideal' musical form, thus reflecting perfection. In Beethoven's view, a fuga always means a form of liberation of pain and oppression, which are by nature imperfect. However, the second part of this fuga becomes darker and darker, with more violence in the theme, which is now in the minor mode, in octaves, with syncopas in the counter subject suggesting anger and pain. The fuga ends in a negative mood, suggesting a negatively oriented response to the question. Then follows again an *arioso dolente*, in the same manner as the previous one. However, this *arioso* progressively 'climbs' up in the upper part of the keyboard. It ends by several very luminous chords in G major. Then follows another fuga, using the same theme as the previous fuga, but in mirror (example 6, melodic intervals are symmetric to the original theme as a mirror). The fuga becomes more and more luminous, using rhythmic variation effects expressing joy and happiness (rhythmic structures are also inverses to those of the question: roughly a short duration followed by a longer one). It ends by a kind of choral that symbolizes victory. This form is very close to the last movement of the 9th symphony: the celebration of victory after several failures.

Obviously our comments are very short and informal, they nevertheless suggest the non-verbal, in a rather symbolic form, arguments for or against a certain attitude that traversed Beethoven's life. The rhetoric symbols he used are powerful tools with an immediate impact on listeners, with strong persuasion effects.

From a rhetoric and argumentation point of view, this analysis shows:

- analogy with language forms, e.g. question intonation, stress and rhythm,
- numerous musical elements shared by the various pros and cons arguments showing strong interactions,
- alternations between major and minor modes, ascending-descending melodies, etc. to illustrate pros and cons,
- proto-rhetorical forms such as mirror effects, which suggest opposition or resistance to the initial figure,
- use of highly symbolic forms such as fugas, trills, etc.

5 Symbolism and argumentation in JS Bach C Minor Passacaglia: 'Quaerendo invenietis'

The late works of JS Bach are extremely symbolic and follow very strict rhetoric schemas. The citation above from Bach's Musical Offer (*quaerendo invenietis*: investigate and you'll understand, an analogy to the Biblical 'ask and you'll receive') indicates the needs to explore the structure of his works to understand the topics addressed and how they are addressed. This late baroque period was very much influenced by works in philosophy and mathematics. Bach made an extensive use the symbolism of numbers (there is a large literature on this topic). Leibnitz in particular (he also lived in Leipzig) had an important influence on Bach.

Let us investigate here a rather accessible work, the Passacaglia in C. Minor, BWV 582 (1716), for organ, which was written when Bach was 31 years old [8, 10]. It had a major influence on composers from the 19th and 20th centuries. The work is based on a powerful theme, used as an ostinato (repeated theme), mainly at the bass, of 3/4 times over 8 bars. It is repeated a total of 21 times (a symbolic figure: 3 x 7: here trinity and perfection). The three voices above the bass are counterpoint elaborations that embody the messages and here the arguments Bach wants to push forward in this work. Each of these 21 sequences is associated with a very precise symbolism that

forms a coherent network of signs. Let us very briefly present them below.

When analyzing the rhetorical structure of this work and the symbols in the various sequences, it becomes clear that there is a strong symbolic dimension associated with the structure of the work:

- numerical proportions in melodies and rhythms: 3 for the Trinity, 7 for the seven days of the creation, etc.

- use of symbolic forms in melodies, such as the cross, formed from the notes: B,A,C,A (or equivalently: B A C H, which is Bach's signature),

- use in each sequence of Lutheran choral fragments borrowed from the *Orgelbuchein* (e.g. *Nun komm' der Heiden Heiland*, *Christ lag im Todesbanden*) that make more clear the underlying contents of each sequence.

Radulescu [5] shows that this work is an argumentation in favor of the necessity of crucifixion. See also: <http://www.davidrumsey.ch/Passacaglia.pdf>. The 21 sequences reflect that debate, the conclusion being acceptance.

The organist MC Alain divides the 21 sequences of this work into groups of 3, each contributing to an organized form of debate, related to crucifixion and redemption, and each with a specific melodic symbolism and a specific choral. The different facets of the debate, each sequence, is an argument, the whole piece being the argumentation leading to the acceptance of crucifixion. The global rhetorical architecture of the work follows the classical Renaissance rhetorics, with two views which are apparently in opposition, but which can be merged into a conclusion. Very briefly:

- **Expositio and Elaboratio:** the three first sequences introduce the atmosphere and the general problematics: perversion of humanity, very introspective counterpoint of the melody, which is gradually descending with numerous syncopas suggesting pain; the organ registration must be sober.
- **Exordium:** introduces the facets of the debate (God is unhappy with humans), sequences 4 to 6, descending intervals in canonical form in sequence 5 (example 7), or voices going in opposite directions. The contents is suggested by choral short extracts and for sequence 6 by a rather suggestive rhythm at the bass (2 anacrustic fourths followed by a quaver with an accent). XXXXX
- **Propositio:** general statement (humanity needs sacrifice), necessity of crucifixion becomes clear with very recurrent symbols, giving a strong persuasion force to these statements. This is realized in sequences 7 to 10, (with the use of groups of 4 notes: examples 8 (a) and (b) symbolizing the cross, and the inclusion of choral fragments in quarter note), reference to God's son (choral: *Vom Himmel kam der Engel Schar*).
- **Confutatio:** counterarguments: sequences 11 to 13, sequence 12 is in general analyzed as the climax of the work, where the theme progressively disaggregates at the bass and climbs to the upper part (sequence 13), in contrast with the other sequences, as a large complain (example 9). These three sequences express doubts (theme disaggregation) and anger (dramatic use of the theme on the upper part, no pedal), they therefore constitute a kind of schema for a symbolic counter-argument, furthermore a contrast is introduced by the lack of pedal which was so far present, suggesting a very stable atmosphere.
- **Confirmatio:** going beyond the two views for or against, reinforcement of the initial proposal, crucifixion is accepted. Sequences 14 to 16 contain intertwined melodic fragments from the two previous rhetoric structures.
- **Peroratio:** conclusion of argumentation, crucifixion entails re-

demption, sequences 17 to 19, with a new dynamics in rhythm symbolizing happiness and a reference to Easter period chorals.

- **Final conclusion (coda):** redemption and celebration, sequences 19 to 21, using ascending intervals, organ registration must be brilliant.

It is clear that Bach's music is not as direct as Beethoven's: symbols are deeper, more abstract and more complex to perceive. However, at his period, chorals and their main melodic characteristics were known by almost everyone, facilitating understanding. From reports and comments of this period, it seems that understanding such a work was accessible to a wide audience.

6 Conclusion

In this short paper we have informally presented some very preliminary aspects suggesting abstract forms of argumentation in western tonal music. These aspects remain largely symbolic or psychological, but this is a constitutive part of argumentation. However, music is at least as complex as language, using more abstract means. Obviously there is always a rational, almost textual, contents which is implicit, and which can be retrieved in the composer's life (Beethoven) or in the liturgy (Bach).

In this paper, we have presented two composers, with very different profiles and culture. We have also attempted to show how musical themes are treated and transformed using a model based on alternations, but with very different processes. We also aim at analysing the different musical means deployed by composers in terms of pre- or proto-rhetoric forms (e.g. mirror, theme fragment amplification, fugatos), as we could have in language proto rhetoric relations. We feel some form of **argumentative signature** could be defined.

There are many other composers worth considering to investigate argumentation, in particular from the 19th century. If some of them are rather flat in terms of internal debate, there are other composers which are of much interest. Besides R. Wagner, a particularly interesting case is R. Schumann, who himself created two characters, Eusebius (quiet, dreaming, pessimistic) and Florestan (noisy, optimistic, unpredictable, etc.), to characterize his personal debates. In his work, these two characters correspond to different musical moods, types of melodies, rhythms, etc. His questioning concerned several aspects of his artistic creation, ending in a suicide in the river Rhein, not at night, but on a gloomy, dull morning, as 'predicted' in his *Gesange der Frühe*.

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Grave.

Example 1

Allegro assai. (♩. = 126.)

Example 2

Op. 111. Componirt im Januar 1822.

Maestoso.

Example 3

Example 4

Fuga. Allegro, ma non troppo.

Example 5

11 (120) *Lo stesso tempo della Fuga.*
Poi a poi di nuovo vivente.
(Nach und nach wieder auflebend.)

sempre una corda
L'inversione della Fuga. (Die Umkehrung der Fuge.)

Example 6

Example 7

Example 8 (a) and (b)

Example 9

cresc.

Example 10