

# The Phenomenon of the Number 3 in Music

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**Abstract:** In this publication, broad evidence is presented for the influence of the number three on different levels in the musical art: three properties, three values, three characteristics and others, observed in different elements of the musical language, in different relations and interconnections. This concerns the separate tone, as well as the correlations of the tones on the vertical and the horizontal plane. Attention is pointed at the parameters of both pitch and duration of the buildings elements of music, and also at the structure of musical pieces - the musical form. In almost all direction, the importance of the number three is found.

**Keywords:** The Number Three, Tone Pitch, Tone Duration, Musical Language, Mode, Chord, Musical Form

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## 1. Introduction

Music is a complex, elitist art, insofar as it works with means of expression, which are outside the everyday life (language in communication and in poetry, forms and colors in the surrounding world and in the visual arts). The sound, that sound, which has an exactly specified pitch and duration (i.e. the tone) is the building element of musical language, and it, in particular, is not related to the everyday spatial or social orientation of people. This imposes the usage of a complex, varied and multi-level organization of the structural material, which impresses with its properties – systematicness, interconnection, symmetry, but also with its subordination to the number 3.

## 2. Subject, Goals and Tasks

The subject of this publication are the relations, which are found in the structure of musical speech - modal structures, modal functions, musical methro-rhythm, musical syntax, musical form.

The goal of the present study is to draw attention to known facts of musical theory, main characteristics, properties, principles in the structure of music, which, however, are not well-thought enough from the position of their subordination to the triad thesis-antithesis-synthesis, of the dependence on the unifying and differentiating role of the three-element structure.

The announced goal determines also the tasks:

1. To follow the influence of the number 3 in regards to the qualities of the main building element of music - the tone;
2. To reveal the manifestations of the number 3 in expressing the logic and the contents of the musical thought;
3. To identify the presence of three-element organization in the more complex elements of musical speech.

## 3. Characteristics of the Tone

The musical sound - the tone - has four basic properties: pitch, intensity, timbre and duration. Still at this level, the influence of the number 3 can be noticed - this concerns the first three qualities, because the qualities of the tone, which are determined by the different characteristics of the sound wave, are that many:

a) height (the pitch) determines the number of vibrations of the source of the sound per second; b) intensity is subordinate to the intensity, with which the resounding body is vibrating;

c) timbre is determined by the presence of overtones, accompanying the main tone. In this way, these three qualities of the tone are included in the sound wave, which is displaced in space - the reason to define the mentioned triad as a space coordinate of the musical sound.

The sound wave becomes alive in time, which represents the temporal coordinate of sound and is perceived as the duration of the tone. This fourth, but by far not least in music,

quality of the sound, is brought to life in the musical practice again through three elements – duration of the tone, metric organization, precisely defined tempo.

## 4. The Manifestation of the Number Three in the Temporal Organization of Music

The musical thought is built from sounds, which have precisely fixed pitch and duration.

### 4.1. Three Elements of Tonal Duration

Tonal duration, which controls the processuality in music, is based on three elements:

- a) Rhythm, with which the duration of each tone of the melody is marked (long - short tones);
- b) Metric, which organizes the different tonal durations through strong and weak pulsations in two basic metric forms - two-beat and three-beat (with varied combinations between them);
- c) Tempo – the speed, in which the beats alternate. Tempos also have three main types - fast, moderate, slow tempo, even though the combinations between these three main types of tempos can be numerous.

### 4.2. Three Elements of the Metric Organization

The metric organization, often in a combination with characteristic rhythmic cores, allows the distinguishing also of three main types of genres [4]:

- a) Song. Songs are as varied in the metric aspect, as the feelings they convey;
- b) Dance. The diversity of dances is characterized by a precisely specified metric, sometimes with the presence of a repeating rhythmic formula;
- c) March. The march genre is defined mainly by the strict two-beat metric pulsation – stressed-unstressed beat, distinctive rhythm and moderate tempo.

### 4.3. Three Base Elements of the Musical Contexture

Music expresses feelings, ideas, moods, again through three main elements - melody, rhythm, harmony.

## 5. Polyphony

Polyphony in music is viewed mainly in the sphere of classical harmony, which was established in the works of the Western European classical composers - XVII – XVIII century. The fundamental means in classical harmony is the chord, which in its simplest form is a triad. The definition for a triad is based on its three main qualities:

- a) The presence of three different in pitch tones (if they are two, a harmonic interval would sound, not a chord);
- b) The simultaneous sounding of these three tones (if they sound in sequence, this will result in a melody, not a chord);
- c) Alignment of the three tones (or the possibility to

arrange them) in thirds.

The third, i.e. the building element of the chord, is an interval, which includes three sequential degrees.

The chord in classical harmony has three characteristics:

- a) Structure - three-voice, four-voice, five-voice...;
- b) Functionality - stability-instability;
- c) Phonism - consonance-dissonance. (The listed qualities will be reviewed in detail further on in the exposition).

The triad has three harmonic positions - one root and two inversions.

a) The triad is in the root harmonic position, when, in the lowest voice, the root tone sounds (the one, on which the rest are stacked in thirds); it is called a first chord;

b) When the third of the chord sounds in the lowest voice, the triad is in the first inversion; it is called a second chord;

c) When the fifth tone of the chord sounds in the bass, the triad is in the second inversion and is called a third-chord.

The triad also has three melodic positions, which are determined by the tone, sounding in the highest voice.

The influence of the number three is pronouncedly visible - chord structure in thirds (i.e., build on the basis of intervals with three degrees), the presence of three simultaneously sounding tones, three harmonic and three melodic positions.

## 6. Modal Structures

On the basis of the multiple existing sound lines – differing in volume (number of degrees) and interval structure, of which the melody up to the Renaissance was built, the two most vital modal structures were established in the end of the 16th century - the major and the minor sound line, called later classical, with their variants - harmonic and melodic type.

The three-element quality has left its mark on the structure and meaning of each of the degrees of the modal structure:

a) T (tonic) - the center, unifying all elements - first degree. The two most closely related to the tonic tones, concerning the interval relation, are:

b) the tone, standing at a ascending perfect fifth - D (dominant) (fifth degree) and

c) the tone, standing at a descending perfect fifth - S (subdominant) - fourth degree. The dominant manifests instability, agility, dependence, sounds with a marked aim towards the center. The subdominant has the task to instill balance between the pronouncedly assertive instability of the dominant and the evident dominating role of the tonic. In this way, the number three appears for the first time in relation to the three main degrees of the scale - first - fifth - fourth, on which the three main triads are built.

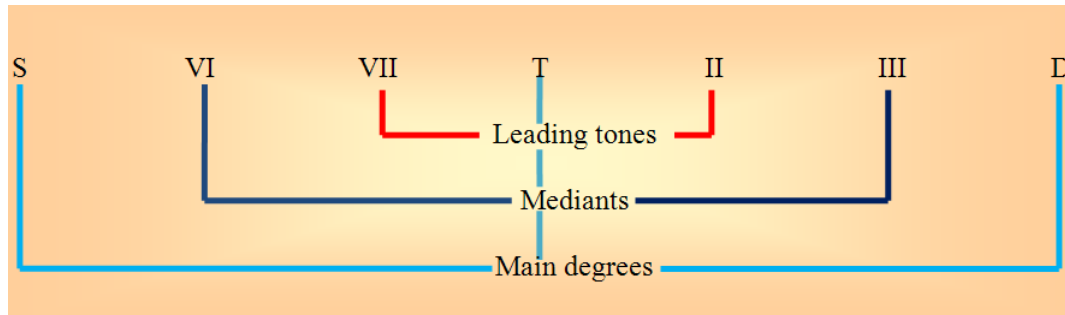
Between the tonic and the dominant and the tonic and the subdominant are found the other two degrees - the mediant. These are the two degrees, standing at a third from the tonic. Their function is to define the colours, nuance, characteristic sound of the modal structure - the more harshly sounding major modal structure (when the interval between the tonic and the upper mediant is a major third) and the softer

sounding minor modal structure (when this interval is a minor third). The two leading tones are near the first degree - the seventh and the second degree, whose role is to, through their tension, accentuate the stability of the tonic.

These are well-known facts from music theory. It is important, however, to underline that, in the pitch organization of the musical thought, there is succession, manifested through three groups (types) of functions, i.e. the

influence of the number three is established also on a higher level:

- Main function (first, fourth and fifth degrees, on which the main chords are built);
- Mediants (third and sixth degrees, controlling the modal inclination - major or minor);
- Leading (seventh and second degrees, creating tension around the tonic) - scheme № 1.

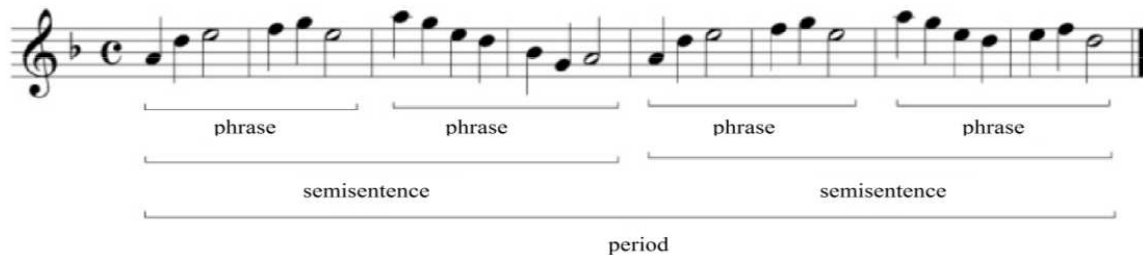


*Scheme № 1. main functions of the mode.*

## 7. Musical Forms

At the most basic level, the musical flow is organized by the metrorhythm. The groups of metric units are combined in musical constructure, i.e. the musical thought, flowing through time, is organized also on a different level, a higher musical logic - the musical syntax. The complete musical

thought, which, as a logical musical structure, has a message - specific emotional content, character, has its own structure, which is called a musical period. As a rule, the musical period is divided into semisentences, each of which usually is comprised of phrases (Figure N 1).



*Figure № 1. R. Schumann – A peasant song*

### 7.1. Three Form-Building Principles

In the long historic period of the development of music, many musical structures have been established - musical forms, through which the authors express their musical idea. In the structuring of the musical material, the main form-building principles are three:

- uniformity - repetition of musical material;
- similarity - modified repetition;
- contrast - a new emotional sphere.

### 7.2. Ternary Forms

In the song genres and instrumental miniatures, the musical forms that are observed are simple strophic (comprised of one period), simple binary (of two periods) and simple ternary (of three periods). In the simple binary form, the principle of contrast is already shown - the two periods have a contrasting (to a varying degree) emotional

content. In many of the small children's instrumental pieces (the piano miniatures of Schumann, Tchaikovsky and others), the three-element quality is manifested - contrasting first and second periods (i.e. manifestation of the principle of contrast) and a third, who repeats the first one or presents a variation of it with a small change (manifestation of the principles of uniformity or similarity). Thus, the structure of the simple ternary form is represented schematically as "a b a" or "a b a<sub>1</sub>". The ternary form is considered the most symmetric structure in music, while symmetry is an expression of equilibrium, balance, staticity.

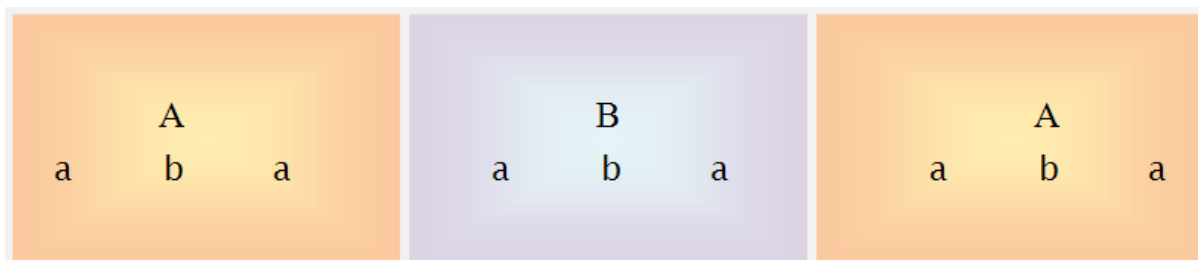
A further developed musical form is the complex ternary one. In its classical variant, each of the three partitions is in a simple ternary (more rarely binary) form. In this case, a thrice expressed contrast is observed.

- Between the small "a" and "b" partitions within the first large partition (A);
- Between "A" and "B" - the two large partitions of the

form;

c) Between the small "a" and "b" partitions within the

second large partition (B); In this way, the complex ternary form has the following structure (Scheme №2):



*Scheme № 2. classical structure of the complex ternary form.*

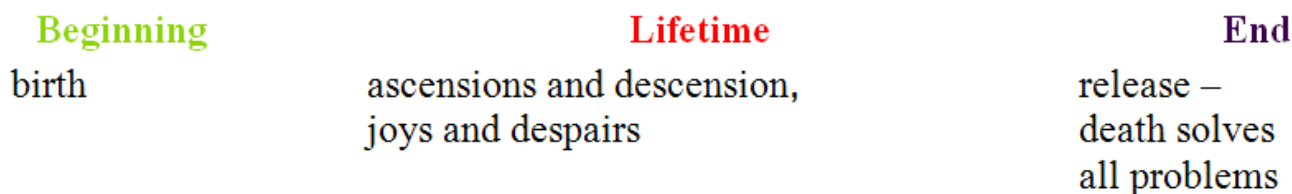
In this form, a stacking of the number three is observed: three large partitions, each of which is comprised of three small partitions.

### 7.3. Three-Element Quality of the Sonata Form

The most complex form in music is the sonata-allegro. It has a structure, in which, in the most general terms, three main structural units can be discerned - exposition, development, reprise. In the exposition (the first partition), the two main characters are presented - the first theme – main, and its antipode - the second theme. Between the two themes, there is more or less a pronounced contrast, depending on the idea of the author. When the emotional content of the two musical images is in more distant emotional spheres, this allows a more extensive, more saturated with musical events development (second partition in the sonata form). In this middle partition, through juxtaposition of elements of the two themes, a dramaturgical culmination of the structure is reached. The conflict is resolved through the appearance of

the reprise (third partition of the form), which can be different, to a varying degree, from the exposition: in the order of appearance of the two themes, in the complete or shortened performance of one of them, in the appearance of a new episode, the absence of one of the themes, and so on.

In the age of the Romanitism, the sonata form was enriched with the inclusion of more than two themes in the exposition, with influence from other musical forms, for example - variations. A good example of a romantic sonata form is the symphonic poem of Fr. Liszt, "Les préludes". The work was written on the basis of verses by the French poet Lamartine. The literary idea was expressed by Liszt: "What else is our life but a series of preludes to that unknown Hymn, the first and solemn note of which is intoned by Death?" In this piece, after the introduction, two main thematic images appear. The form is a sonata-allegro with widely used elements of variability. Through the sonata structure, the main idea is brilliantly portrayed, philosophically represented (Scheme № 3) through the triad:



*Scheme № 3. A triad in the structure of the Symphonic poem "Les préludes" by Fr. Liszt.*



**Figure № 2.** Fr. Liszt - "Les préludes" - the theme of the introduction, the first theme and the second theme (the last two are variants of the theme of the introduction).

#### 7.4. Three-Element Quality of the Rondo Form

The rondo form is characterized by a constant return to one main musical image - the main theme. Between the appearance of the theme, separate episodes sound, which gradually, with the development of the musical material,

break away in their emotional content from the main musical image, reaching a brightly contrasting musical constructure, which bears the culmination of the work. In the classical structure of the rondo, the main theme and the episodes usually are in a simple ternary form (Scheme № 4):



*Scheme № 4. Structure of the classical rondo form.*

Beside in the form of each of the large partitions, the three-element model is established also at a higher level - the larger sections "A" "B" "A" form the initial sequence in relation to the form, the "C" partition represents the contrasting antithesis, after it, the partitions, "A" "B" "A", are repeated again - the partitions, through which the main musical impression is returned.

#### 7.5. Three-Elements in Sonata-Symphonic Cycles

The sonata form is used not only as a independent musical work, but much more often as the first part of the sonata-symphonic cycle. According to the classical tradition, the cycle has four parts - the first part is in a sonata form and

with a quick tempo; the second part usually is a complex ternary form with slow tempo; the third part is again a complex ternary form - genre character (dance, most often - a minuet, but a march could also appear); the fourth part - the finale, usually in a rondo form and quick tempo. Many symphonies and chamber works have been written in such a cycle, as well as, although much more rarely, instrumental concertos and sonatas. In the greater part of the instrumental concertos and sonatas, also in some symphonies, the genre third part is not present. In that case, the following levels of the three-element structure are observed - three parts, three elements in each part and three partitions in each of the large sections of the second and third part (Scheme № 5):

I part	II part	III part
<b>Sonata-allegro</b>	<b>Complex ternary form</b>	<b>Rondo</b>
I partition   II partition   III partition	A                      B                      A	A   B   A   C   A   B   A
exposition   development   reprise	aba                      aba                      aba	aba aba aba aba aba aba aba

*Scheme № 5. Structure of a three-part sonata-symphonic cycle.*

The number three manifests its unique ability of organizing matter and ideas by far not only in music: three are the basic colours, three are the main literary genres, three are the types of building elements of the atom (protons, neutrons, electrons), three are the coordinates of space, the dialectic law, known in Philosophy as Hegel's triad, is comprised of three elements (thesis-antithesis-synthesis), three are also the main laws in dialectics. The Christians believe in the Holy Trinity. A quick look at the unique qualities of the number three and its multiples in mathematics:

*Table № 1. Additions of digits, forming sequences of multiples of the number 3.*

1	x	3	=	3					
2	x	3	=	6					
3	x	3	=	9					
4	x	3	=	12	(1	+	2	=	3)
5	x	3	=	15	(1	+	5	=	6)
6	x	3	=	18	(1	+	8	=	9)
7	x	3	=	21	(2	+	1	=	3)
8	x	3	=	24	(2	+	4	=	6)
9	x	3	=	27	(2	+	7	=	9)
10	x	3	=	30	(3	+	0	=	3)
11	x	3	=	33	(3	+	3	=	6)
12	x	3	=	36	(3	+	6	=	9)

## 8. Conclusions

1. The number three has a significant role in regards to the spatial characteristics of the tone.

2. The number three is established as basic in relation to the temporal organization in music.

3. The number three has a great importance for the modal structures.

4. The number three manifests a pronounced influence in respect to polyphony.

5. The number three has a dominating importance in the form creation in music.

6. The number three defines the main types of musical genres.

We can conclude from the above that logical orderliness and completeness of the musical system depends to a great degree on the phenomenal organization ability of the number three, whose elegant invariability invokes admiration and respect.

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