UDC 78.01 TEMPERAMENTS OF TONALITIES AS A PERMANENT FACTOR OF THE MUSIC COMMUNICATION

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Abstract:

Music communication is a complex process that encompasses layers such as content, intention, means and forms, content receivers, and feedback. This paper aims to identify permanent factors in music communication and to describe and analyse them according to the impact made in the communication process, to show how music can carry and present clear messages independent of genre, and to focus on temperaments of tonalities as a permanent tool of music communication.

Key words: temperaments, tonalities, rhetoric, communication.

1. Introduction.

'Music has a fundamentally social life. It is made to be consumed – practically, intellectually, individually, communally – and it is consumed as symbolic entity'¹. The main question of this paper is how permanent factors remain in music communication, which also depends on changing world contexts. In this article, the focus is on the examination and interpretation of the meaning of the tonalities of the compositions strongly embedded in the non-musical context 'Ode to Joy' and 'The Wall' by 'Pink Floyd', which became the symbols of the fall of the Berlin Wall. A particularly important aspect is the permanent features of the communication of the music composition after the change of the historical context.

2. Theoretical and practical approach to the tuning systems and the characteristics of intervals

Within the field of music, there exists a unique phenomenon where sounds convey a deeper meaning that may not be immediately evident. Interrelationships between music and the spoken arts are at obvious and unclear at the same time. Furthermore, the art of sound has the capability to encode specific musical meanings using various musical expressions, in addition to the inherent communicated information such as melody, harmony, rhythm, texture, intervals, tuning. All interconnected musical concepts that relate to rhetoric and oratory have their origins in the literature on these subjects by ancient Greek and Roman writers, primarily Aristotle 'Rhetoric' (350 BC), Cicero 'De Oratore' (55 BC), and Quintilian 'Institutio Oratoria' (95). We can trace the cosmological concept of music back to Pythagorean roots, which Boethius (480-524) transmitted down to the Middle Ages and had a significant impact on musical practice until the Renaissance and beyond. The Pythagoreans conducted acoustic research that resulted in the precise mathematical ratios being attributed to the basic interval structures. The Pythagoreans immediately derived these ratios by dividing the string into sections, which allowed for the determination of specific intervals. Within this system, the most basic numerical ratios correspond to ideal consonances. For instance, dividing the string in a 2:1 ratio produces an octave, while a 3:2 ratio results in a fifth. If we posit that the universe's cosmic structure is ensured by numbers, and that the perfect simplicity of the numerical relationships governing it ensures harmony, we can draw a parallel between musical harmony and the harmony of the cosmos. Thus, we can define the fundamental principle of the

¹ <u>Steven Feld</u>. 'Communication, Music, and Speech about Music'. <u>*Yearbook for Traditional Music*</u>, 16, (1984), 1–18, 1 <u>https://doi.org/10.2307/768199</u>, accessed 12 Sept. 2024.

world not only as mathematical, but also as mathematical-musical. Plato in the Timaeus² describes the World-Soul³ according to ratios which directly match the ratios⁴ in the Pythagorean system. In the Republic Plato concludes with a calculation of the number of times the best life is more pleasant than the worst: 729. 'If one turn's it around and says how far the king is removed from the tyrant in truth of pleasure, he will find at the end of the multiplication that he lives 729 times more pleasantly, while the tyrant lives more disagreeably by the same distance.' 'You've poured forth,' he said, 'a prodigious calculation of the difference between the two men-the just and the unjust-in pleasure and pain.' 'and yet the number is true,' I said, 'and appropriate to lives too, of days and nights and months and years are appropriate to them.' 'But, of course, they are appropriate' he said'.⁵ This quote sounds quite mysterious, but is it? Do we know the meaning of this quote written thousands of years ago? Is it metaphorical or have very concrete meaning? Why the king lives exactly 729 times more pleasantly, than the tyrant and who is the tyrant? Let's look closely at the next two examples.

Gb	Db	Ab	ЕЬ	B♭	F	С	G	D	А	Е	Н	F#
1024:72 9	256:243	128:81	32:2 7	16:9	4:3	1:1	3:2	9:8	27:1 6	81:6 4	243:12 8	729:51 2

1 C	3	9	27	81	243	729 Fis
2	6	18	54	162	486	1458
4	12	36	108	324	972	2916
8	24	72	216	648	1944	5832
16	72	144	432 A	1296	3888	11644

Example 1. Notes and approximate Ratios in the Pythagorean tuning

Example 2. Connection between Tyrant of Plato Republic and tritone (bastard pleasure). 432 Hz approximate tuning.

It is unlikely that Plato would have accidentally used the number 729, which is clearly revealed when analysing the Pythagorean system. Plato assigned the epithet tyrant to one of the more

² The Foundation for Platonic Studies, The Dialogues of Plato, tr. David Horan, (34C–36E).

³ In Plato's Timaeus the creation of the World-Soul, a model for the physical universe, is accomplished through the use of Pythagorean proportions; duple and triple geometric series are filled in with arithmetic and harmonic means, as a result of which one can see 'the whole heaven to be a scale and a number' (Aristotle, Metaphysics). The musical scale thus produced is that of Pythagorean tuning, and the World-Soul is created through the use of a kind of celestial monochord. 'Music of the spheres' in Haar James, eds., *Grove Music Online*, (London, 2001).

⁴ 'He made the soul from the following constituents and in this manner. From Being that is undivided and ever the same, and Being which, by contrast, comes into existence apportioned to bodies, he formed a third intermediate form of Being from both of them. [...] He began to divide it as follows: first he separated one part from the entire; after this he separated a part double the first, and next a third, which was one-and-a-half times the second and three times the first; a fourth part, double the second; a fifth, three times the third; 35C a sixth, eight times the first; and a seventh, twenty-seven times the first. After this he filled up 36A the double and triple intervals, cutting off further sections of the mixture and placing these in between them so that in each interval there were two means: one exceeding its extremes and being exceeded by them by the same portion; the other exceeding one extreme and being exceeded by the other extreme by an equal number. These connections gave rise to intervals of 3/2, 4/3 and 9/8 between the previous intervals. All the 4/3 intervals were filled up by the 9/8 intervals 36B leaving a portion of each of them, and the interval associated with this remaining portion had the numerical relation 256/243. What's more, the mixture from which these were cut was at that stage, entirely used up in the process.' The Foundation for Platonic Studies, The Dialogues of Plato.

⁵ Plato, *Republic*, (375BC), 587 d–e. Other epithets about the life of the Tyron are mentioned in different translations: 'painful'⁵, 'more wretchedly'⁵ Plato. 'The Collected Dialogues of Plato: Including the Letters', ed. Edith Hamilton and Huntington Cairns. (Princeton, NJ: Princeton University Press, 1961), 815; Great Dialogues of Plato. Tr. Eric H. Warmington and Philip G. Rouse (Mentor Books, New American Library, 1956), 388–389.

unstable and dissonant intervals – tritone⁶, but it my opinion it was not by accident. This insight also explains the importance attributed to the tritone in later periods: the Middle Ages, the Baroque. In the part on rhetoric, we will see that in the Baroque era, intervals were used very carefully. For example, the tritone was used when the text contained words such as pain, death, snake⁷. The epithets rough, unstable, very unpredictable (sly, needless, imperfect)⁸ assigned to tritone is easily explained by the results of 20th century research. From the philosophical point of view, it is particularly important to note that, despite the symmetry of the tritone and the charm of the systems based on it, despite the instability and tension caused by it that has predominated in music for the last few centuries, it should be remembered that, as Plato wrote in The Republic.

Very important argument when speaking about the dissonance or consonance is the structure of the ear, which detects and analyses sound through transduction, maintains a sense of balance, that is changing infinitely slowly. Moreover, we can say that we used to the harshness of the dissonance but is it true? The human body (ears) is a very important and, one might say, very slow-changing factor. Why is this important? Despite that culturally even the biggest dissonance⁹ doesn't surprise us anymore, but what about our body? We can assert that, despite people's acclimatisation to its sound, the tritone is no longer the same dissonant interval as it was hundreds of years ago, but this is essentially fiction. The main argument is our body, to be exact, the cochlea. Despite the possibility to have conditionally fast changes in the cultural agreement on the definition of the consonance or dissonance but for visible changes in the e.g. human ear it takes millions of years¹⁰. We can assume that when the tritone or other dissonances sounds, a sensory dissonance is felt in the human inner ear. The greater the local dissonance, the more impulses are transmitted to the cochlea

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⁶ Tritone as Diabolus in Musica was first mentioned by Johann Joseph Fux in his treatise Gradus ad Parnassum (Fux 1725: 51). Also, an epithet Mi contra Fa est Diabolus in Musica is dedicated to August W. Ambros and mentioned in his work Geschichte der Musik (Band II). August W. Ambros. *Geschichte der Musik* (Leipzig, F. E. C. Leuckart, 1880), 180.

⁷ In Bach's St. Matthew Passion, BWV 244, the tritone is used when it comes to lies, death and murder to emphasize the tragedy of the situation: 'droht den Pfleger zu ermorden; denn es ist zur Schlange worden'. Johann Sebastian Bach, *Matthäuspassion*, BWV 244, ed. Georg Schumann (1866-1952), (Leipzig: Ernst Eulenburg.1929), 52.

⁸ Creates a tension, energy effect, suitable for conveying the mood of the war; it is hateful to nature; it is annoying and irritating to human hearing. These and more epithets are assigned in Micrologus (1025/26) by Guido Aretinus (991–1033), and in the treatise Opuscula Musica (c. 1030) by Hermanus Contractus (1013–1054).

⁹ 'It is clear that individual differences and cultural background can influence significantly the musical intervals that are judged to be "pleasant" or otherwise. Thus, for example, Indian musical scales contain "microtones" in which the conventional scale is subdivided into smaller units, producing many musical intervals that do not correspond to simple ratios. Indian music often sounds strange to Western ears, especially on first hearing, but it clearly does not sound strange to Indians; indeed, the microtones, and the various different scales that can be composed from them, are held to add considerably to the richness of the music and to the variety of moods that it can create. Although there is a psychoacoustic basis for consonance and dissonance judgments, these judgments also display individual differences and follow changes in the cultural norm. Modern classical music, for example by Stravinsky and Stockhausen, contains many examples of chords that would have been considered dissonant 20 years ago but that are now enjoyed by many people'. Brian C. J. Moore, *An Introduction to the Psychology of Hearing*. (Leiden, 2012), 238.

¹⁰ Several recent studies have focused more specifically on the cochlea and have defined a number of new measurements to quantify its shape. Some of these studies have found that the cochlear morphology in fossil hominins contains important taxonomic and phylogenetic information to differentiate between African apes, Australopithecus africanus, Paranthropus robustus and early Homo specimens [...]. In particular, the length of the external border of the cochlea has been argued to be proportionally longer in the genus Homo than in early hominins. At the same time, Beals et al. (2016) found that the cochlear volume in the Krapina Neandertals was similar to that of modern humans, but larger than in gorillas and chimpanzees. Most recently, Conde-Valverde et al. (2019) carried out a detailed study of the cochleae in the SH hominins and defined a new measurement protocol. That study found that the cochlea in the SH fossils shows a mosaic pattern, with some primitive features shared with Pan troglodytes, together with other derived features shared with recent humans and Neandertals and a derived pattern of cochlear proportions, with a relatively long 1st turn and a very short 3rd turn in the latter'. Mercedes Conde-Valverde, Ignacio Martínez, Rolf Quam, Juan-Luis Arsuaga, Joan Daura, Montserrat Sanz, João Zilhão. The cochlea of the Aroeira 3 Middle Pleistocene cranium—a comparative study, Journal of Human Evolution,





Example 3. Consonance Preferences and Their Possible Acoustic Basis (McDermott, 2010) 440 Hz approximate tuning.

The experiment done by McDermott shows that more 'than 250 subjects, only the preference for harmonic spectra was consistently correlated with preferences for consonant over dissonant chords. Harmonicity preferences were also correlated with the number of years subjects had spent playing a musical instrument, suggesting that exposure to music amplifies preferences for harmonic frequencies because of their musical importance. Harmonic spectra are prominent features of natural sounds, and our results indicate that they also underlie the perception of consonance'.¹²

According to Marcin Strzelecki¹³ (2014), tritone and major seventh have the least coincidence of partial tone pairs while the perfect fifth's consonance is due to the merge of partial tones into one entity.



Example 4. Sensory dissonance: (a) perfect fifth, (b) tritone, (c) major seventh (Strzelecki 2014: 9)

Tritone's and major seventh's partial tones don't coincide but are close to each other which raise local dissonances producing harsh and dissonant sound. According to the Example 5, we can conclude that tritone's dissonance is described not only by abstract epithets such as sharp, harsh, unpleasant, and distant to nature but also by facts and the permanent factors of the music communication established by research in physics.

3. Athanasius Kircher and his 'Musurgia universalis' (1650): three basic emotions

It is important to make an introduction about the rhetorical vocabulary, characterisation of the

¹¹ 'For two tones of frequencies f1 and f2 the beating frequency (f2–f1) results in sensation of 'roughness' once its value falls within particular range. This range is related to critical bandwidth – a phenomenon created by the cochlea'. Josh H. McDermott , Andriana J. Lehr , Andrew J. Oxenham, 'Individual Differences Reveal the Basis of Consonance', *Current Biology*, 20, 11, (2010), 1035–1041, 1036.

¹² McDermott, 'Individual Differences Reveal the Basis of Consonance', 1036.

¹³ Strzelecki Marcin. *Relacje pomiędzy harmoniką a brzmieniem w muzyce XX wieku*. PhD Thesis. The Krzysztof Penderecki Academy of Music in Kraków, 2014, 9.

intervals and tonalities, which was very important in Baroque. To comprehend the theories and understand the essence of baroque music, it is important to have a thorough understanding of rhetorical vocabulary and the intellectual framework of rhetoric. Given that the entire subject has been eliminated from our educational system, the task is not easy.

The writings of Plato, (429-347 BC) Aristotle (384-322 BC), and especially Quintilian (30-35after 94) are essential for this purpose as well as Rene Descartes' influential philosophical work, 'The Passions of the Soul'. This seventeenth-century masterpiece has had a significant impact on musical theory and aesthetics. Athanasius Kircher (1602-1680) - the last man who knew everything¹⁴ – in his book 'Musurgia universalis' (written in 1647, published in 1650), analyses nature of pitch, anatomical construction of the human head and ear, demonstrates the actual hearing and response of the ear to music, constructions of the various music instruments and affects. In Baroque rhetoric was a theory which formed entire scheme of rhetorical figures and relation of intervals, modes and melodies. Ancient Greek and Latin writers' rhetorical doctrine aimed to teach orators to control and direct audience emotions, influencing classical rhetoric and baroque music treatises. In Baroque composer was obliged, like the orator, to arouse in the listener idealized emotional states – sadness, hate, love, joy, anger, doubt and so on – and every aspect of musical composition reflected this affective purpose. For example, Kircher identified three basic emotions¹⁵. According to him, music moves the mind in different ways depending on the context of different periods and different tonal arrangements. Descartes' (1650) logical categorization of the affections as he imagined they existed in the human body influenced the baroque theorists' intense focus on emotion as explained by rhetorical theory. Despite being sceptical towards all accepted forms of knowledge, philosopher largely drew inspiration from Plato, Aristotle, and Gioseffo Zarlino (1517-1590) for his philosophy and music ideas. Descartes describes six passions¹⁶ / affects: wonder, love, hatred, desire, joy, sadness.

While it was easier to appreciate it in music associated with a text, the aim in instrumental music was the same. It is important to say that music was full of symbolical meanings. Even if we look closely to the frontispiece of the Kircher's book we can find a lot of symbols that reflect his research. The model found in the Frontispiece of Athanasius Kircher 'Musurgia universalis, sive Ars magna consoni et dissoni' reveals authors philosophical standpoint. The Holy Trinity, symbolising music as a reflection of the essential mathematics and proportions of Creation. The middle section features a globe of the world, symbols of the Greek mythology: Goddess, The Pan

¹⁴ Athanasius Kircher. The Last Man Who Knew Everything', (New York-London, Routledge, 2004). The similar meaning in the title of the book by Joscelyn Godwin 'Athanasius Kircher. A Renaissance Man and the Quest for Lost Knowledge', (London, Thames & Hudson, 1979).

¹⁵ 'Ita & Musica pro vario periodorum contextu tonorumque diversa dispositione, varie animum agitat. Mouet autem animam nostram per tres potissimos affectus, ex quibus tanquàm ex radice quadà alij postmodum nascuntur; Sunt autem hi tres affectus cenerales sequentes; primus est laetitia, quae sub se continet affectus amoris, magnanimitatis, impetus, desiderij; qui ex fanguine originem suam nanciscuntur; si veró laetitia dissoluta intemperata que fuerit, generat affectus proprie cholericos, irae, odij, indignationis, vindictae, furoris. Secundus remissionis affectus generalis cum tardo motu gaudeat, generat affectus pietatis, amoris in Deum, item constantiae, modestiae, severitatis, castiraris, religione, contemptus rerum humanarum, adamorem denique caelestiu movet. Tertius est misericordiae affectus, sub qua manent omnes ij affectus qui à phlegmate & cholera nigra profluunt, vti sunt tristtiae, planctus, commiserationis, languoris, fimilesque, qui ad hanc classem reuocari possunt. Quomodo autem huiusmodi affectus vi Muficae excitentur in anima, dicetur in physiologia harmonica; modo tandem ostendendum est, qui toni queue clausulae tropicae sint; quae figurae dictis affectibus concitandis propriae sint, & primó quidé dicemus de duodecim tonis; deinde de totidem tropis seu figuris harmonicis prout aptitudinem in se habent, ad animam nunc ad hos, nunc ad illos afectus concitandam'. (Kircher 1650: 142, t. 2)

¹⁶ 'Qu'il n'y a que six passions primitives. Mais le nombre de celles qui sont simples et primitives n'est pas fort grand. Car, en faisant une revue sur toutes celles que j'ai dénombrées, on peut aisément remarquer qu'il n'y en a que six qui soient telles; à savoir: l'admiration, l'amour, la haine, le désir, la joie et la tristesse; et que toutes les autres sont composées de quelques-unes de ces six, ou bien en sont des espèces. C'est pourquoi, afin que leur multitude n'embarrasse point les lecteurs, je traiterai ici séparément des six primitives; et par après je ferai voir en quelle façon toutes les autres en tirent leur origine.' René Descartes, *Les passions de l'âme*, ed. Henry Le Gras, (Amsterdam, 1650), 94.

flute, lyre, circles of dancing mermaids, a shepherd trying out the echo¹⁷, and the winged horse of the Muses – Pegasus. The lower part features blacksmiths in a cave, referencing to Pythagoras discovering the foundations of musical tuning. Analysing this frontispiece makes us come back to the idea that Kircher possibly was one of the last who knew everything. Only few symbols were mentioned to make a parallel between meanings coded (artificially or naturally) in music.

4. Temperaments and characters of the tonalities: theoretical and practical approach

The rhetoric of music is not a sudden process. On the one hand, the rhetoric of music appeared as a counterpoint to Renaissance polyphony, when the focus was on the melodic line and the rather technically used musical language, this way of composing was criticized by Nicola Vicentino (1511–1576), Vincenzo Galilei (1520–1591). On the other hand, it is believed that its establishment was also influenced by manuscript 'Institutio Oratoria' of one of the Quintiliano, published in Rome, has been newly published in the 15th century.

For Kircher very important aspect is ascending or descending melodic interval. In his treatise 'Musurgia universalis' he explained that the interval affects the soul differently¹⁸. This is only one example from the 18th century but there were many more Mark Antoine Charpentier (1645–1704) 'Regles de Composition' (1682), Jean-Philippe Rameau (1683–1764) 'Traité de l'harmonie réduite à ses principes naturels' (1722), Johann Mathesson 'Der vollkommene Capellmeister' (1739). In the treatise 'Die Kunst des reinen Satzes in der Musik: aus sicheren Grundsätzen hergeleitet und mit deutlichen Beyspielen erläutert' (1774) by Johann Philipp Kirnberger (1721–1783) author provides the meanings / moods of falling and rising intervals. Music has a very specific impact on the listener and Quintilian's quote¹⁹ about armies being affected by music is literal, not figurative. 'Accordingly, the theorists, the rational musical philosophers of this era, could not deny that the human soul did respond emotionally to music. They sought, thusly, to create the link between the scientific paradigms of tonal harmony and the forces that shaped humanity's emotional response to music.'²⁰

Speaking about the permanent factors of music communication, there are various examples when the compositions created in different periods becoming a symbol of the future events. In this analysis the chosen event is the Fall of the Berlin Wall. In this analysis the parameters mentioned by Charpentier who suggested creating the following parameters for musical affect: harmony, rhythm, tempo, intervals, dissonances, melodic direction, dynamics, combinations of the rhetorical figures,

¹⁹ 'It is recorded that the greatest generals played on the lyre and the pipe, and that the armies of Sparta were fired to martial ardour by the strains of music. And what else is the function of the horns and trumpets attached to our legions? The louder the concert of their notes, the greater is the glorious supremacy of our arms over all the nations of the earth'. Quintilian. 'The Institutio Oratoria', tr. H. E. Butler, (Cambridge, Mass: Harvard University Press, 1920), 165.

²⁰ Hall, Sharri K. 'The Doctrine of Affections: Where Art Meets Reason', *Musical Offerings*: Vol. 8: No. 2, (2017), 53.

¹⁷ 'Echo still had a body then and was not merely a voice. But though she was garrulous, she had no other trick of speech than she has now: she can repeat the last words out of many. Juno made her like that, because often when she might have caught the nymphs lying beneath her Jupiter, on the mountain slopes, Echo knowingly held her in long conversations, while the nymphs fled. When Saturnia realised this she said, 'I shall give you less power over that tongue by which I have been deluded, and the briefest ability to speak' and what she threatened she did. Echo only repeats the last of what is spoken and returns the words she hears'. Ovid, *The Metamorphoses*, tr. A. S. Kline (Poetry in Translation, 2000), 92.

¹⁸ Kircher begins his treatises of the affections with a summary of traditional humoral theory. 'The vapors from the four humors mix in various proportions according to the objects of the imagination. If the object is full of indignation or jealousy, the spirits and the vapors from the gall bladder, mobilized by the imaginative force, acquire the temperament of warmth and dryness and drive the soul into affections of anger, fury, and rage. An object that is agreeable and full of love causes sanguinous vapors from the liver to become warm and humid; agitated by soft and harmonious movements, they sweetly and tenderly move the soul to taste joy, hope, confidence, love, and cheer. If the object is terrifying, sad, and tragic, the vapors rising from the receptacle of black bile endow the animal spirit with a cold and dry temperament, subjecting the soul to melancholy, sorrow, pain, lamentation, and similar affections. A delicate, smooth, and moderate object, neither sad nor joyous, causes the vapors to become cold and humid, and the animal spirits impel the soul to passions of cheerfulness, calm, confidence, and noble love'. Claude V. Palisca, 'Music and Ideas in the Sixteenth and Seventeenth Centuries', ed. Thomas J. Mathiesen, (Chicago: University of Illinois Press, 2006), 194.

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timbres. In this article the main focus is on the meaning of the tonalities of the compositions which became the symbols of the fall of the Berlin Wall. In the 17th century based on the unique temperaments and characters of the tonalities²¹:

	MA. Charpentier	C. Masson	J. Rousseau	JP. Rameau	JJ. Rousseau		MA. Charpentier	C. Masson	J. Rousseau	JP. Rameau	JJ. Rousseau
Do M.	Gai et guerrier		Pour les choses gayes & pour celles qui marquent de la grandeur	Chants d'al- legresse & de rejoüissance	Duturiburi	fa m.	Obscur et plaintif	Triste & lugu- bre	Pour les plain- tes & tous les sujets lamen- tables	Chants lugu- bres	Du touchant, du tendre jusqu'au lugu- bre et à la dou-
			Pour les plain- tes & tous les	Tendresse &	du tendre porte la ten-	Sol M	Doucement	Gay et brillant	Pour le tendre	Chants tendres	Du gai, du
do m.	Obscur et triste		sujets lamen-	plaintes	dresse dans		joyeux	ouy er orman	Tour le tenure	& gais	brillant
		Accestla	tables	Charle Hal	plus touchant que le D la ré	sol m.	Sérieux et magnifique	Plein de dou- ceur & de ten-	Pour le triste	Douceur & tendresse	Du touchant, du tendre
Ré M.	Joyeux et très guerrier	Agreable, joyeux, écla- tant, & propre pour les chants de victoire	rour les choses gayes & pour celles qui marquent de la grandeur	legresse & de rejoüissance Le grand & le magnifique	Du gai, du brillant	La M.	Joyeux et	dresse	Pour les Piéces devotes ou	Chants d'al- legresse & de rejoüissance	Du gai, du
ré m.	Grave et dévot	Je ne sçay quoy de grave mêlé de gaveté	Propres pour le serieux	Douceur & tendresse	Du touchant, du tendre		cnampetre		chants d'Eglise	Le grand & le magnifique	ormant
Mi b M.	Cruel et dur				Sombres et même un peu durs	la m.	Tendre et plaintif	Propre pour faire quelque demande avec	Propres pour le serieux	Tendresse & plaintes	
mi b m.	Horrible,							ferveur			
Mi M.	Querelleux et criard			Chants tendres & gais Le grand & le magnifique		Si b M.	Magnifique et joyeux			Tempestes, furies & autres sujets de cette espece	Sombres et même un peu durs
mi m.	Efféminé, amoureux et plaintif		Pour le tendre	Douceur & tendresse		si b m.	Obscur et ter- rible			Chants lugu- bres	
		Naturallament	Bour las Diánas	Tempestes,	Du maias	Si M.	Dur et plaintif				
Fa M.	Furieux et emporté	gay mêlé de gravité	devotes ou chants d'Eglise	furies & autres sujets de cette	tueux, du grave	si m.	Solitaire et mélancolique			Douceur & tendresse	

Example 5. Temperaments and characters of the tonalities.

Phenomenal that the five researchers (Ex. 5) assign very similar temperaments and characters to tonalities. These characteristics will be used in the analysis of the symbols of the collapse of the Berlin Wall. Let us return to Potsdamer Platz which is rich with symbolism derived from the historical events that took place in Germany during the 20th century. What piece of music did the German crowds sing as they celebrated the fall of the Berlin Wall in November and December 1989? No doubts²² it must have been 'Ode to Joy' chorus from Ludwig van Beethoven's Symphony No. 9 in D minor, Op. 125 (1824), with its fitting phrase 'all people become brothers'. Another significant and the iconic concert known as 'The Wall' performed by Roger Waters of Pink Floyd at Potsdamer Platz on July 21, 1990. What is common between stylistically different compositions to become the symbol of the same context? There must be similar musical structures in these compositions, melodies, lyrics, tonalities etc.

······································							
Movement	Movement I	Movement II	Movement III	Movement IV			
Tonalities	d	d D d D	Вь D Вь G E ь Вь	d D d D Bb G D D D			

²¹Demeilliez Marie. 'Tempéraments inégaux et caractères des modes: l'énergique variété des tonalités', éd. Carine Barbafieri, Chris Rauseo, (Presses universitaires de Valenciennes, 2009), 550–551.

²² Yet another piece of music is cited just as often for capturing the spirit of the time. It is none other than 'Looking for Freedom', performed by American actor. How this is possible? And why? In my opinion there are the few aspects: 1) lyrics of the song; 2) easy to sing and memorable melody in the C major; 3) the marketing of the song; 4) context; marketing promotion of this song (famous artist on the stage, variety shows on German TV with Hasselhoff singing the song, numerous of live performances.

	1	r		
Characterisation	serious and	serious and	magnificent and joyful	serious and pious
	pious	pious	joyous and very	joyous and very
		joyous and	warlike	warlike
		very warlike	magnificent and joyful	serious and pious
		serious and	serious and	joyous and very
		pious	magnificent	warlike
		joyous and	quarrelsome and	magnificent and joyful
		very warlike	boisterous	serious and
		-	magnificent and joyful	magnificent
			- •••	joyous and very
				warlike

Example 6. Analysis of the Ludwig van Beethoven's The Symphony No. 9 in D minor, Op. 125 (1824).

(10=.).		
Side I	'In the Flesh?'	Ascending intense melody
		Introduction: e E Verses A
		amorous, plaintive; quarrelsome and
		boisterous, effeminate; joyful and
	'The Thin Ice'	pastoral
	'Another Brick in the Wall, Part 1'	C – gay and warlike
	'The Happiest Days of Our Lives'	d – serious and pious
	'Another Brick in the Wall, Part 2'	d – serious and pious
	'Mother'	d – serious and pious
		G – serious and magnificent
Side II	'Goodbye Blue Sky'	D – joyous and very warlike
	'Empty Spaces'	e – effeminate, amorous, plaintive
	'Young Lust'	e – effeminate, amorous, plaintive
	'One of My Turns'	C – gay and warlike
	'Don't Leave Me Now'	f – obscure and plaintive
		a – tender and plaintive
	'Another Brick in the Wall, Part 3'	d – serious and pious
	'Goodbye Cruel World'	D – joyous and very warlike
Side III	'Hey You'	e – effeminate, amorous, plaintive
	'Is There Anybody Out There?'	a – tender and plaintive
	'Nobody Home'	C – gay and warlike
	'Vera'	G – serious and magnificent / e –
	'Bring the Boys Back Home'	effeminate, amorous, plaintive
	'Comfortably Numb'	D – joyous and very warlike
Side IV	'The Show Must Go On'	D – joyous and very warlike
	'In the Flesh'	A – joyful and pastoral
	'Run Like Hell'	D – joyous and very warlike
	'Waiting for the Worms'	G – serious and magnificent
	'Stop'	e – effeminate, amorous, plaintive
	'The Trial'	e – effeminate, amorous, plaintive
	'Outside the Wall'	C - gay and warlike

Example 7. Analysis of 'The Wall' by 'Pink Floyd' (1979).

Both compositions have the very similar initial meanings which is coded not only in the temperaments and characters of the tonalities²³ but also in the lyrics. The word freedom was in the

²³ Based on the analysis, the characteristics of Beethoven's Symphony No. 9 in D minor, Op. 125 are: Triumph; Victory-rejoicing; Magnificent; Joy; Serious; Hope aspiration for a better world and the characteristics of 'The Wall' are: Hope; Happiness, Triumph; Victory-rejoicing; Magnificent; Joy; Serious.

air. Leonard Bernstein conducted two performances of the Ninth Symphony on December 23 and Christmas Day 1989 when he even changed the words of Friedrich Schiller's poem 'Ode to Joy' to 'Ode to Freedom'²⁴ to give the text more symbolical relevance to the fall of the wall. In the 'The Wall' we see lyrics as 'set me free'; 'outside the Wall' and many metaphors about freedom of thought.

Despite the antiquity of the theories discussed in the first chapter, this analysis (based on Descartes, Charpentier, Kirnberger, etc.) shows that two compositions of different periods and styles have an identical character (temperament, energy), which was revealed through the analysis of tonalities. The message of the compositions also responds to the mood of the Berlin Wall, which most probably was hope for freedom mixed with sadness and some fear at the same time. This analysis shows that these two compositions became a symbol of the Berlin Wall not only because of the context but also because of the initial message conveyed in them by the composers.

Conclusions

Music is intended to be used practically, socially, personally, intellectually, or symbolically. We can assume that the communication of musical composition changes throughout the context, e. g. historical events: wars, revolutions, battles, elections, pandemics; media: movies, video games, music videos, installations; interpretations: dynamics, tempos; industry: record labels, music critics, music venues, sound engineers, all mentioned, and many more can affect our perception. On the other hand, the results of scientific measurements showed us that there are permanent aspects: ratios, sound waves, physiological perception of the inner air (cochlea), also rhythm, harmony, melody, interval relations, timbres, rhetorical figures, characteristics and temperaments of tonalities that cause the exact and clearly defined effect to the listener. These permanent factors, which do not depend on the context, are a powerful tool to make an impact on the human body and soul.

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