

Original Papers

DOI: 10.53681/c1514225187514391s.32.231

SEMANTIC ASPECTS OF MUSICAL LANGUAGE

Aspectos semânticos da linguagem musical

ABSTRACT

Music is a complex and multifaceted phenomenon, serving purposes ranging from aesthetic education to therapy and emotional expression. The purpose of this study is to examine the semantic aspects of musical language as an integrated system, focusing on their ongoing development and content complexity. This research employs a comprehensive approach, drawing on the “general theory of systems” developed in the 20th century. It systematically analyses various elements and properties within the musical language, considering their historical evolution and adaptation to contemporary contexts. The study also explores the integration of music with fields such as quantum physics, neuroscience, and computer technologies. The analysis reveals that the semantic aspects of musical language encompass a rich array of elements, including intonation systems, modes, intervals, rhythms, tempo, dynamics, texture, genres, and compositional structures. While some aspects have undergone radical transformations in terms of content and emotional resonance, others remain fundamentally unchanged. The integration of music with diverse scientific and technological domains has expanded the scope of musical art and enriched its semantic dimensions. This study demonstrates that musical art, with its semantic aspects, continues to evolve and adapt to the ever-changing cultural and scientific landscape. The integration of music with fields beyond its traditional boundaries opens up new opportunities for interdisciplinary research and innovation.

KEYWORDS

categories of music; the evolution of the musical system; semantic units in audio creativity; integrative processes; music therapy.

RESUMO

A música é um fenômeno complexo e multifacetado, que serve propósitos que vão desde a educação estética à terapia e à expressão emocional. O objetivo deste estudo é examinar os aspectos semânticos da linguagem musical como um sistema integrado, centrando-se no seu desenvolvimento contínuo e na complexidade do seu conteúdo. Esta investigação utiliza uma abordagem abrangente, com base na “teoria geral dos sistemas” desenvolvida no século XX. Analisa sistematicamente vários elementos e propriedades da linguagem musical, considerando a sua evolução histórica e adaptação aos contextos contemporâneos. O estudo explora também a integração da música com domínios como a física quântica, a neurociência e as tecnologias informáticas. A análise revela que os aspectos semânticos da linguagem musical englobam um conjunto rico de elementos, incluindo sistemas de entoação, modos, intervalos, ritmos, andamento, dinâmica, textura, géneros e estruturas composicionais. Embora alguns aspectos tenham sofrido transformações radicais em termos de conteúdo e ressonância emocional, outros permanecem fundamentalmente inalterados. A integração da música com diversos domínios científicos e tecnológicos alargou o âmbito da arte musical e enriqueceu as suas dimensões semânticas. Este estudo demonstra que a arte musical, com os seus aspectos semânticos, continua a evoluir e a adaptar-se à paisagem cultural e científica em constante mudança. A integração da música em domínios que ultrapassam as suas fronteiras tradicionais abre novas oportunidades de investigação e inovação interdisciplinares.

PALAVRAS-CHAVE

categorias da música; evolução do sistema musical; unidades semânticas na criatividade áudio; processos integrativos; musicoterapia.



OLENA Y. VERESHCHAHINA-BILIAVSKA¹
Supervision, Writing - Original Draft
ORCID: 0000-0002-4559-0230



IRINA V. MAZUR²
Conceptualization
ORCID: 0000-0001-8694-3031



OLESIA V. CHERKASHYNA¹
Methodology
ORCID: 0000-0001-9516-1648



OLENA P. BURSKA¹
Resources
ORCID: 0000-0001-9330-1299



TETIANA D. HRINCHENKO¹
Project Administration
ORCID: 0000-0001-8084-6732

¹ Department of Musicology Instrumental Training and Choreography, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnytsia, Ukraine

² Department of Theory and Methods of Musical Art, Khmelnytskyi Humanitarian and Pedagogical Academy, Khmelnytskyi, Ukraine

Correspondent Author:
Olena Y. Vereshchahina-Biliavska,
21100, 32 Ostrozkyi Str.
Vinnytsia, Ukraine
olena.veresh-biliavska@ukr.net

Submission date:
20/09/2023

Acceptance date:
14/11/2023

1. INTRODUCTION

Musical art is an integral system of interrelated and mutually interacting categories. This system undergoes continuous transformations, actively reacting to the changes in the life of society. Thus, this structure, as a multidimensional and complex phenomenon in its internal content, requires a profoundly scientific approach to its study. It stands on a par with other equally large units, such as literature, fine arts, theatre, dance, and cinema, embodying one of the multifaceted symbols of social consciousness. It is necessary to cover the history of modern system-structural ideas and consider their path to progress. The largest number of studies on the theory of evolution has been conducted in the fields of biology (Darwinism), physics (thermodynamics), astronomy (theory of the universe). Natural science cognition formulated the necessary basis for philosophical science. Many thinkers sought to solve the perennial problems of the relationship between faith and reason, matter, and spirit, by learning about evolutionary processes. The dialectical method of thinking was developed most fully in German philosophy at the end of the 18th – first half of the 19th century by G.V. Hegel (1997) [1], who took the principle of the development of opposites as the initial explanation of all phenomena. Progress, according to G.W. Hegel (1997) [1], is the “self-development of concepts”. The studies of G. Spencer (1896) [2], in particular, in the work "Sociology as a Subject of Study", contain a necessary and essential definition of evolution, which the author understands as the integration of matter and the concomitant dissipation of motion, during which matter passes from indefinite, incoherent homogeneity to definite, coherent heterogeneity, and during which the retained motion undergoes a parallel transformation.

Three great scientific discoveries of the mid-19th century played a decisive role in the establishment of the dialectical view of nature: the law of conservation and transformation of energy; the cell theory of the structure of organisms; the evolutionary theory of Ch. Darwin. The science of nature has entered a new stage – from the study of subjects it has shifted to the study of processes, examining the development and connection of phenomena, synthesising the processes of nature into a single whole. Many developments were distinguished by a characteristic feature: they were synthetic, they could be attributed to the natural-scientific area and to the philosophical-theological. These include the studies of P.T. de Chardin (1965) [3], in particular his study “The Phenomenon of Man”, in which the main attention when considering the anthropological problem is paid to development. According to P.T. de Chardin (1965), evolution is something more than a theory, a system, a hypothesis, it is their main condition. It is necessary to emphasise the importance of the author’s idea that with an increase in physical complexity (to which the whole path to progress is subordinated), the process of consciousness continues [3].

When analysing the “relationships” of scientific disciplines at the present stage, it should be noted that after the period of differentiation of sciences, the time has come for their new synthesis, when the boundaries between scientific fields become quite transparent and barely perceptible. This process was especially indicative of the emergence of those fields of science in which there was a synthesis of the natural-scientific and humanitarian fields of knowledge – mathematical logic (“Boolean algebra” or “algebra of statements”); structural linguistics; information theory; general theory of systems; structuralism; semiotics. The refers of theoretical musicology to these deeply interconnected fields of modern “synthesis of knowledge” is not accidental. “General systems theory” allows interpreting its terms and concepts in each specific, individual area and giving meaning to the existence and implementation of any particular system. However, it does not refer to the literal transfer of any methods and knowledge of the exact sciences to the field of musicology. In this case, it is necessary to discuss the existence of a common mechanism for the evolution of systems of different quality. This area was covered by A.D. Hall and R.E. Feijin (1969) [4], A.G. Usmanov (1959) [5] and Y. Kholopov (1982) [6] who disclosed the idea of the “curtailed genesis” of the system of musical art.

The comprehensive exploration of musical language's dynamic and multifaceted nature is the study's essence. It provides profound insights into how music communicates, evolves in response to societal changes, and transcends disciplinary boundaries by tracing the evolution of semantic aspects in music. By drawing from pedagogy, quantum physics, medicine, and social science, the interdisciplinary approach underscores music's vast intellectual significance. The purpose of this study is to explore the evolving semantic aspects of musical language as a cohesive system, tracing its ongoing development, evolution, and enrichment of content. Through this research, the author aims to depict the contemporary landscape of musical art, revealing how each component category, laden with specific meaning, undergoes transformation and adaptation in alignment with the prevailing era. The study underscores the profound significance of delving into the semantic aspects of music, emphasizing their historical evolution and their dynamic integration with diverse fields such as quantum physics, neuroscience, and computer technologies.

2. MATERIALS AND METHODS

The research commences with a comprehensive exploration of literature and data, which includes musical compositions, historical records, academic papers, and relevant data sources. These materials are methodically arranged and sorted, laying the foundation for subsequent analysis. Utilising the principles of the general systems theory, the study regards the compiled materials as an interrelated complex rather than a mere sum of individual parts. The study explores the complex interplay between diverse elements and components of musical language, elucidating their contribution to shaping music's semantic content. Additionally, this research places paramount importance on tracking the historical and stylistic transformation of semantics in music, granting recognition to the impact of individual composers, artistic styles, and national cultures.

Incorporating insights from related disciplines, including linguistics, pedagogy, psychology, biology, neurology, and electronics, this study adopts an interdisciplinary approach. It investigates the influence of advancements in these fields on the comprehension of semantic components in music, illustrating the substantial interlink between musicology and other natural, social, and technical sciences. Key semantic categories in musical language, including intonation, mode, rhythm, consonance (interval and chord), tempo, dynamics, timbre, genre, and structure (form), have been recognised and meticulously analysed. A detailed investigation of every category's contribution to the overall semantic complexity of music has been carried out.

The study explores the interdisciplinary links between music and fields such as rehabilitation therapy, neuro-linguistic programming and mental well-being restoration. It highlights the wider societal significance of understanding musical semantics. Ultimately, the study amalgamates its discoveries to present an all-encompassing depiction of the evolution and change of semantic features within the language of music. This synthesis is effectively communicated through the use of visual aids and narrative explanations. The language used is objective and concise, avoiding biased or ornamental language. Technical terms are consistently used and explained when first introduced. The structure follows a logical progression with clear causal connections between statements. The text employs conventional academic sections and adheres to formatting guidelines, citation styles, and footnote formatting. The language used is formal and free from contractions, colloquialisms, and unnecessary jargon. The text is balanced and precise, using subject-specific vocabulary where necessary. It is grammatically correct with proper spelling, punctuation, and grammar.

3. RESULTS AND DISCUSSION

3.1. Impact of semantic aspects of musical language on various fields

The collection of materials, analysis of the qualities, characteristics of the semantic aspects of the musical language and their systematisation showed a general panorama of the state of the compositional sound system at the present time. It synthesised classical traditions that have been formed in musical art for centuries and those discoveries that have provided the latest electronic computing technologies. Notably, all categories of musical language bearing a certain semantic load (artistic semantics) have retained their relevance, moreover, they have transformed and expanded their own framework in modern creativity (Table 1). Aspects that directly embody the ways of expressing musical thought and means of expression have undergone fundamental changes: intonation; rhythm; timbre; texture; genre and structure of the piece. There are also a number of categories (aspects of the semantics of musical language) that differ in their objectivity, stability, and immutability. This is the need for the presence of the author of the music, its performer and listener, certain instruments (including the human voice, the latest effects of audio software). The auditory nature of musical art is the most important, practically fundamental and inviolable for musicology of all times and in the future (Table 1).

Table 1
Evolution of semantic aspects of musical language

Categories (semantic aspects of musical language) are being updated, enriched, and expand in their scope	Categories (semantic aspects of musical language) are stable and invariably preserved, remaining inherent in audio compositions
Intonation system or figuratively meaningful aspect of semantics (as a separate core-intonation, and the melody of the piece)	Objectivity (presence of a symbol, theme, idea) of a musical composition
Rhythm or space-time organisation of movement in the audio space	Address of art samples to the listener
Mode or characterological, mood (psychological-emotional) aspect of the semantics of the musical language	Performative fulfilment of an audio composition
The timbre or colour spectrum of sound pulses, signals combined into a single audio composition system	The communicative or social nature of musical compositions, involving a dialogue between the composer and the audience
Tempo or an indicator of the mobility of particles of an integral musical system	Audio concept
Dynamics or an indicator of the sound intensity of the components of a musical composition	Instruments
Texture or indicator of the degree of sound density of an audio	Psychological and emotional effect

It is necessary to determine what effects of the evolutionary transformations of the musical language system have manifested at the present stage.

Based on “general theory of structures”, regarding the “system” as “an organism formed by progressive differentiation and developing from a simple state to a state of high complexity, and, considering the specificity of the application of the theory of evolution in relation to musical art, it is necessary to note the effect of such a principle of development as “dialectical sublate”. The emergence of new qualities that characterise the complexity of the system, the enlargement of its main elements (tone, interval, chord, complex), simultaneously leads to the implementation of the opposite principle – the “information surrogation” of components inherent in previous systems. The moment of evolutionary transition, as a rule, is associated with the “collapse” of previous ties and the emergence of new systemic relationships. Indeed, the music of the era of Haydn, Mozart, and Beethoven seems to be simpler, logically schematised (for example, in the field of harmonic cadences) after the complex contrapuntal constructions of Bach with their procedural, non-discrete tonal-harmonic development. However, the resort to homophony in the 17th-18th century did not mean a return, a movement towards simplification. On the contrary, homophonic music in an “informationally surrogated” form absorbed the constructive ideas and experience of the masters of the previous era (in particular, the principles of strict voice science, polyphonic development techniques).

The idea of the existence of a curtailed genesis is covered in the article of Y. Kholopov (1982) [6] “Changing and unchanging in the evolution of musical thinking. Problems of traditions and innovations of Soviet music”. Considering the effect of the “finite factors of music”, which is disclosed in the dialectic of the relationship of opposites – stationary and moving, unchanging and changing, vague and definite, structureless and structural, the author notes the categories “less organised”, “more organised”, “less differentiated”, “more differentiated”, “lower” and “higher” appear as stages of ascent. Due to this, the final – the highest stage of the development of semantic aspects of the musical language, and the subsequent ones, absorbs the genesis, which has a direct impact on the development of a structure with a higher level of organisation of its constituent elements. Thus, the system is, in essence, a “curtailed genesis” or a brief summary of the leading discoveries of previous generations of music authors.

Dialecticism marks one of the basic principles of the general theory of systems: a decrease in the amount of information leads to an increase in entropy, i.e., an equally probable state of the elements of the system, and vice versa, an increase in the amount of information leads to zero-grade entropy, which is associated with greater orderliness, systemic complexity of the organisation, with a high level of differentiation of the elements of the system. The systems that arise as a result of this law are divided into two types: “open” (with zero-grade entropy) and “closed” (with entropy “explosion”).

In music, almost every phenomenon is marked by the ability to maintain its “organised state”, despite the constant tendency to disorganisation. This ability exists since musical phenomena (pieces) are “open systems”. Free development (or, to a certain extent, improvisation) in creativity is a prerequisite necessary for the evolution of musical art. The effects of spontaneity, randomness in presenting an audio composition, which does not reach the manifestation of their extreme – catastrophe, arises from the natural course of development and evolutionary transformations of aspects of the semantics of the musical language, their interaction with each other over time while revealing new qualitative characteristics and principles of the correlation of elements of an integral system. Comprehension of any major process of the system is impossible without considering the factors of conditionality and relativity, without the interaction of diachronic and synchronic laws that are active in a particular structure. Moreover, at present, the factor of the interaction of various structures, sometimes belonging to disciplines and scientific fields that are distinct, is becoming obvious. However, practice shows that the system of musical art, as an integral and harmonious organism, expands its scope and sphere of influence (including through individual semantic aspects of musical language) in society, with the emergence of “intersections” with the general processes of

development and enrichment with new achievements in such areas as psychology and medicine, physics and information and communication technologies (Table 2).

Table 2
The impact of semantic aspects of musical language on subjects of natural, social, and technical sciences

Name of the scientific field	The essence and depth of interaction of aspects of musical semantics with other fields of science
Physics	The study of the origin of a sound, as a unit of artistic information, at the molecular-atomic level, using the methods of the quantum concept.
Medicine	The study of the semantics of categories of musical art that can have a profound therapeutic effect on the human body, in particular on the restoration of the functions of organs and cells.
Psychology	Investigation of neural system responses to semantic aspects of music categories.
Information and communication technologies	The study of the atomic composition of sound particles, an experiment in the field of their transformation, renewal, expansion of internal facets.

Thus, having a “synopsis” of the general historical progress of the musical language and the musical art system in general (“curtailed genesis”), a panoramic picture of this complex structure that has been formed for centuries can be presented (Figure 1).

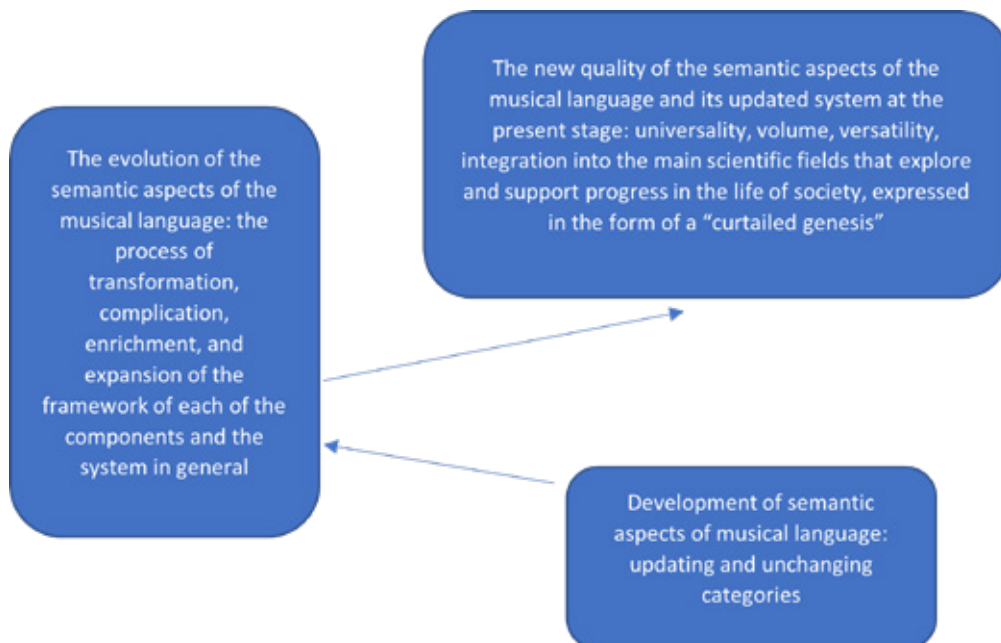


Fig. 1
Semantic aspects of musical language in the context of modernity

Thus, the semantic aspects of the musical language appeared in the above diagram as valuable and considerable components (or categories) of a single integral system called audio composition. This structure has advanced qualities (the ability to respond directly to the spiritual and material needs of various historical epochs, modernise, transform, and regulate their volume) due to the flexibility of its constituent elements – aspects of the semantics of a musical piece. This fact indicates that there are broad prospects for further progress of the system and its components.

In particular, opportunities are offered for the in-depth development of the internal structure of the semantic aspects of musical language and their impact on humans, on the world around them by researchers in fields such as physics, medicine, linguistics, information technology. The evolution of musical instruments and performance techniques has profoundly impacted the semantic content of music. New instruments, like the electric guitar, offer a broad spectrum of sounds, each capable of conveying unique emotions and meanings. Innovative performance techniques, such as those on string instruments, create unconventional textures and sonic experiences. Cultural influences, from historical context to a composer's background, shape musical semantics through scales and rhythms. Neuroplasticity studies reveal distinct neural representations for different instruments in musicians' brains, while music's ability to prime semantic concepts mirrors language. Additionally, elements like tempo, dynamics, and lyrics, alongside structural composition choices, all contribute to the multifaceted semantic content within music.

Musical semantics explores how music conveys meaning, similar to how semantics studies meaning in language. It delves into the non-musical information communicated by musical sounds, expanding our understanding of music beyond its notes and rhythms. In education, studying musical semantics can benefit music teachers and students in various ways (Hromchenko, 2022) [7]. It helps them grasp the emotional and cognitive impacts of music, informing choices in repertoire and performance, improving communication with audiences. Additionally, incorporating musical semantics into teaching enhances musical literacy by fostering a deeper comprehension of elements like melody, harmony, rhythm, and timbre. Moreover, it aids in cross-cultural communication, as music is a universal language with cultural nuances. Understanding musical semantics enables musicians to navigate diverse cultural contexts effectively. Lastly, it plays a crucial role in music therapy by enabling therapists to create tailored interventions that promote physical, emotional, cognitive, and social well-being through music. Currently, the functions, importance, and role of semantic aspects of musical language are of great interest to researchers. However, experts focus their attention, as a rule, on one specific area in which there is full and deep disclosure of the impact of aspects of the semantics of musical art on a person and the world around them.

3.2. Research on the semantics of musical language categories

P. Schlenker (2021) [8] covers the reflection of the semantic aspects of the musical language in the emotions of people, drawing the readers' attention to the internal structure of the musical composition, in particular to the logic of the development and existence of a tonal-functional system, with a series of tensions and releases of unstable elements (degree, consonance, chords) into sustainable. The researcher analyses the pieces of pure music (which gives each listener the basis for an individual interpretation of the meanings and images of the composition), not programme music. The best example of the coverage of the theory of P. Schlenker (2021) [8] is Symphony No. 9 in D minor, Op. 125, commonly known as the "Choral Symphony" by Ludwig van Beethoven. The symphony's four movements, particularly the final movement, incorporate a tonal-functional system with moments of tension and release through dissonant harmonies resolving into consonance. This addition of vocal elements adds an extra layer of emotional depth to the composition, as it celebrates the idea of universal brotherhood and joy. P. Schlenker (2019) [9] discusses the leading role of such a factor as auditory perception and awareness of audio composition, semantic aspects of its language. The primary cognition of the semantic aspects of the musical language, according to the researcher, is conducted through the ability to hear sounds, melody, and complete composition. Secondary – has prerequisites that distinguish the semantics of audio creativity from the semantics of the linguistic area. The author discloses the idea of mobility of such categories as perception and holistic awareness of a musical piece, which exists due to the spatio-temporal character of audio art. Johann Sebastian Bach's "Brandenburg Concerto No. 3 in G Major, BWV 1048" fulfils these criteria. The Brandenburg Concerto No. 3 is known for its complex melodies,

harmonies and orchestration. When listening to this concerto, one perceives the sounds, melody, and overall composition in the way P. Schlenker (2019) [9] described.

In many ways, the opinion of S. Malloch and C. Trevarthen (2018) [10] is close to this viewpoint. In their opinion, a person at birth receives elements of communicative musicality. By developing and enriching the elements in gaining experience of music perception and impressions from acquired information, a person obtains the ability to transform the “language of emotions” into a strict and perfect system of classical rules for the establishment and existence of cultural symbols (Obukhova, 2019) [11]. One example from music heritage that aligns with the idea of S. Malloch and C. Trevarthen (2018) [10] is the evolution of jazz music. Jazz is a genre that originated in the United States in the late 19th and early 20th centuries. It was deeply influenced by African rhythms and melodies, European harmonies, and various other musical traditions. At its core, jazz is a highly expressive and improvisational form of music that relies heavily on the emotional connection between the musicians and their audience.

One of the leading aspects of the semantics of the musical language in the study of L.-H. Canette et al. (2020) [12] is tonality. It is associated with one or another spectrum of the colouring of the sound of a musical theme, and with a certain metaphor in the context of an audio composition. The relations of tonalities in music according to the classical for theoretical musicology circle of fifths have become the subject of studies for specialists in the field of quantum physics. The study by K. Graben and R. Blutner (2019) [13] aimed at clarifying and coordinating the static and dynamic phenomena of tonal attraction from the standpoint of musical psychology within the framework of quantum cognition. Quantum models of static and dynamic tonal attraction are presented and compared with conventional computational algorithms in musicology. Such an approach discloses the character of symbolic models of music perception from the perspective of quantum mechanics (Graben and R. Blutner, 2019) [13]. The classical composition “The Well-Tempered Clavier” by Johann Sebastian Bach is ideal for representing the researchers’ ideas. In this work, Bach demonstrates the idea of tonality as each piece explores a particular key and its unique tonal characteristics. The circle of fifths is prominent as the tonal relationships between different keys are explored throughout the collection.

Such a category of musical language and one of its semantic aspects, namely rhythm plays a leading role in the research of M. Gooßes et al. (2020) [14]. As the researchers note, music-assisted treadmill training (MATT) is a new therapeutic approach to the recovery of patients with Parkinson’s Disease (PD), combining the treadmill and rhythmically organised sound signals, their visual display. PD studies have shown a greater positive effect of this technique on motor results than regular treadmill workouts. This method, based on rhythmicity, contributes to the restoration of automation and coordination of movements (Gooßes et al., 2020) [14]. The semantics of the musical language, expressed by such a category as timbre, in particular the live, classically staged singing voice of a person, is analysed by a whole group of specialists. A. Sihvonen et al. (2020) [15] concluded that daily listening to vocal music contributes to the recovery of the body after a stroke, to the normalisation of the functions that ensure the functioning of the speech apparatus. It activates the work of cells, improves the quality of verbal memory, increases the volume of grey matter in the left temporal lobe of the brain.

M. Maggio et al. (2020) [16] study the energy field, which is contained in the sounding music, and which is also one of its categories bearing an individual semantic load. Researchers, during experiments in the field of art therapy used to restore the functions of the musculoskeletal system and the state of consciousness of the individual in general, came to the conclusion that music largely improves balance in static body position and coordination of movements, increases walking speed and the feeling of emotional and mental well-being.

Music, as a powerful and universal stimulus for activating brain activity, is currently used in neurorehabilitation, and is offered as a promising additional strategy provided in combination with other types of therapy for people with neurological disorders (Terletska, 2022; Messina and Fogliani, 2010; Lashkova et al., 2018) [17-19]. Various techniques and devices have been developed in the field of musical neurorehabilitation. The variety of existing techniques allows using music therapy in various situations and conditions. Furthermore, a wide range of devices used, from simple musical instruments to more advanced technologies, allows developing individual

exercises based on the needs of the patient (Vereshchahina-Biliavska and Marynychuk, 2019; Kachur and Kutsyn, 2018) [20; 21].

However, researchers have the opportunity to examine the impact of semantic aspects of music on a person not only for purely rehabilitative purposes. Audio art helps to improve and develop creative abilities and speech skills in elementary school and higher school students, as well as students (Yerahmetkyzy et al., 2022; Ponomarenko et al., 2016) [22; 23]. This idea is being actively implemented in educational practice among the population of one of the coastal regions of Kenya (Mombasa), where a spiritual tradition is professed, according to which music lessons are not welcome. The researchers call for an in-depth study of the manifestations of Islamic culture in audio pieces that have arisen in the region under consideration throughout the history of its existence and for attracting students to choose professions directly related to musical art (Shitambasi, 2021) [24].

This idea is developed and analysed by the researcher S. Milhano (2021) [25] as well. In his opinion, the “informal music programme” in the learning process provided the participants of the experiment with emotional, social, cultural, and musical experiences. Thus, heterogeneity and diversity of information centres in the educational sphere are considered as factors enriching the overall development of personality, in particular, of a future specialist (Bocheliuk et al., 2022) [26]. S. Milhano’s (2021) [25] conclusions are devoted to the way music helps to strengthen spiritual, social, mental connections and a sense of humanity during higher education.

The explanatory and descriptive function of musical art was analysed in publication by S. Kölsch (2022) [27]. The practical activity of these specialists allowed them to highlight the fact that music, its character, themes, moods, and images have the power to reveal the meaning of certain words and concepts. The principle of contrast (or mismatch) of musical pictures, images, characters and facial expressions, gestures served as the basis for training, the purpose of which is to improve the activity of memory, to activate its functions. This is how the phenomenon of the semantics of opposites, expressed, among other things, through audio art, was actualised (Kongyratbay et al., 2015) [28].

The perception of such a category of musical language as consonance and dissonance by various epochs, traditions, and cultures is considered by I. Lahdelma and T. Eerola (2020) [29]. The semantic aspect of this category of musical language appears in their publication as a “biocultural phenomenon” (Lahdelma & Eerola, 2020) [29]. Such a category of music as its perception by listeners becomes the leading one in the publication of X. Liu et al. (2021) [30]. The researcher establishes the relationship between the aesthetic impact of a musical composition on the audience and the emotions with which it perceives the composition, between the genre of music and an individual’s personality as a complex phenomenon.

The semantics of musical compositions are related to human emotions, perception and rehabilitation. The principles of quantum mechanics are used to analyse musical qualities such as pitch and harmony. Rhythm in music is used for medical therapy, while vocal music shows neurological benefits (Spytska, 2023) [31]. Beyond science and medicine, semantic musical elements also influence education, cultural experience, memory, and personality (Tusseyev et al., 2021) [32]. This wide range of intersections demonstrates the depth and breadth of music’s artistic significance in different dimensions of human life. In general, while experts often focus on one particular musical category or application, semantic aspects in general have a profound impact on human experience at both individual and collective levels. Studying them opens up further possibilities for uncovering the complex interplay between the aesthetics of sound and the human condition.

4. CONCLUSIONS

The semantic aspects of music are a vibrant palette of elements, properties and, in general, categories of the harmonious and voluminous system that audio art represents. Each of them is, in turn, the most important link of this structure, playing its own irrevocable role.

These are intonation system, mode, a system of intervals and chords (consonances), rhythmic pattern, tempo and dynamics, texture, genre and compositional structure (musical form). As evidenced by historical practice, all of them have undergone an evolution, thereby transforming an integral system of musical art. Such components of the audio context as intonation, mode and rhythm, timbre and texture underwent a radical transformation in terms of the content and type of images, moods. The following components of the musical language remain unchanged, with their inherent semantic aspects: the creation of audio composition, its performance, the listener's perception, and the presence of certain means of sound delivery (voice or instrumentation). In collecting, systematising, and analysing the materials devoted to the subject of this article, the author came to the conclusion that at the present stage the integral, harmonious, and multifaceted system of musical art and, accordingly, the semantic aspects embodying one or another of its categories have enriched and expanded their scope due to integration into other, sometimes distinct from the cultural sphere, scientific fields. These include quantum physics and neuroscience, software of the latest computer technologies. The interaction of musical art and the listed fields of scientific and practical knowledge of the surrounding world ensures progress, not only in the field of musicology as an independent discipline but also in the humanitarian climate of social life. Certainly, this creates favourable conditions for further interaction of researchers from different industries and broad prospects for the renewal of musicology as a science, with the new knowledge and the results of practical experiments in it and in other (related) fields. According to the author, such an approach to this subject will ensure its flexibility, mobility due to responsiveness to what is happening in real-time. The system of musical language and its constituent categories, which have certain semantic aspects, will be continuously modernised, embodying the progressive trends of modernity and representing progress in the history of humanity.

BIBLIOGRAPHIC REFERENCES

- [1] Hegel, G.V. (1997). *Science of logic*. St. Petersburg: Nauka.
- [2] Spencer, H. (1896). *Sociology as a subject of study*. St. Petersburg: Nauka.
- [3] de Chardin, P.T. (1965). *The human phenomenon*. Moscow: Progress.
- [4] Hall, A.D., Feijin, R.E. (1969). *Definition of the concept of a system*. Moscow: Progress.
- [5] Usmanov, A.G. (1959). *Generalization of experimental data on transport processes in gases: thesis of doctor of technical sciences*. Moscow: Academia of Sciences of the USSR. G. M. Krzhizhanovsky Energy University.
- [6] Kholopov, Y. (1982). *Changing and unchanging in the evolution of musical thinking. Problems of traditions and innovations of Soviet music*. Moscow: Soviet Composer.
- [7] Hromchenko, V. (2022). The integration's problem of specialized musical disciplines into the distance education. *Interdisciplinary Cultural and Humanities Review*, 1(1), 6-12.
- [8] Schlenker, P. (2021). Musical meaning within super semantics. *Linguistics and Philosophy*. <https://dx.doi.org/10.1007/s10988-021-09329-8>.

- [9] Schlenker, P. (2019). Prolegomena to music semantics. *Review of Philosophy and Psychology*, 10(1), 35-111.
- [10] Malloch, S., & Trevarthen, C. (2018). The human nature of music. *Frontiers in Psychology*, 9, 1680.
- [11] Obukhova, N. (2019). Emotional awareness of the subjects of audio media culture with different styles of interpersonal interaction. *Scientific Studies on Social and Political Psychology*, 44(47), 135-142.
- [12] Canette, L.-H., Lalitte, P., Bedoin, N., Pineau, M., Bigand, E., & Tillmann, B. (2020). Rhythmic and textural musical sequences differently influence syntax and semantic processing in children. *Journal of Experimental Child Psychology*, 191, 10471.
- [13] beim Graben, P., & Blutner, R. (2019). Quantum approaches to music cognition. *Journal of Mathematical Psychology*, 91, 38-50.
- [14] Gooßes, M., Saliger, J., Folkerts, A.-K., Nielsen, J., Zierer, J., Schmoll, P., Niepold, A., Colbach, L., Leemhuis, J., Engels, L., van Krüchten, M., Ophey, A., Allert, N., Karbe, H., & Kalbe, E. (2020). Feasibility of music-assisted treadmill training in Parkinson's Disease patients with and without deep brain stimulation: Insights from an ongoing pilot randomized controlled trial. *Frontiers in Neurology*, 11, 790.
- [15] Sihvonen, A.J., Leo, V., Ripollés, P., Lehtovaara, T., Ylönen, A., Rajanaro, P., Laitinen, S., Forsblom, A., Saunavaara, J., Autti, T., Laine, M., Rodríguez-Fornells, A., Tervaniemi, M., Soimila, S., & Särkämö, T. (2020). Vocal music enhances memory and language recovery after stroke: Pooled results from two RCTS. *Annals of Clinical and Translational Neurology*, 7(11), 2272–2287.
- [16] Maggio, M. G., Tripoli, D., Porcari, B., Manuli, A., Filoni, S., Naro, A., Eschweiler, M., & Calabrò, R. S. (2021). How may patients with MS benefit from using music assisted therapy? A case-control feasibility study investigating motor outcomes and beyond. *Multiple Sclerosis and Related Disorders*, 48, 102713.
- [17] Terletska, Y. M. (2022). Fundamentals of psychosocial deprivation. *Astra Salvensis*, 2022(1), 265-281.
- [18] Messina, A., & Fogliani, A. M. (2010). Valproate in conversion disorder: A case report. *Case Reports in Medicine*, 2010, 205702.
- [19] Lashkova, Y., Berdibayeva, S., Beissenova, Z., Mun, M., Faizullina, A., Serimbetov, B., & Gizatullina, A. (2018). The phenomenon of "disappearances" in the process of supervision in a permanent professional multimodal supervision group. *Psychiatria i Psychologia Kliniczna*, 18(1), 35-40.
- [20] Vereshchahina-Biliavska, O.Y., & Marynchuk, T.T. (2019). Mastering the skills of semantic and artistic-pedagogical analysis as a necessary component of professional training of a music teacher. In: *Proceedings of the 3rd International scientific and practical conference "Topical issues of the development of modern science"* (pp. 34-40). Sofia: Publishing House "ACCENT".
- [21] Kachur, M. M., & Kutsyn, E.K. (2018). Theoretical principles of art-therapeutic competence of a teacher of musical art. *Scientific Bulletin of Mukachevo State University. Series "Pedagogy and Psychology"*, 4(2), 136-139.

- [22] Yerahmetkyzy, Z., Shyryn, K., Kulgildinova, T., Lazzat, A., Yerlan, A., & Ulbala, I. (2022). Teaching children's literature to school children through digital educational resources. *World Journal on Educational Technology: Current Issues*, 14(5), 1332-1342.
- [23] Ponomarenko, Y. V., Kenzhebekova, R. I., Yessaliyev, A. A., Moldabek, K., Larchenkova, L. A., Dairbekov, S. S., & Jumagulova, G. (2016). Pedagogical research methods of training in higher educational establishments: A comparative analysis. *Mathematics Education*, 11(9), 3221-3232.
- [24] Shitambasi, S.B. (2021). Effect of aural tests on choice of music as a study subject by Muslim students in Mombasa County, Kenya. *European Journal of Education and Pedagogy*, 2(3), 137-140.
- [25] Milhano, S. (2021). Fostering meaningful and creative connections in higher education: Contributions from music education. *European Scientific Journal*, 17(26), 27-43.
- [26] Bocheliuk, V. Y., Spytyska, L. V., Shaposhnykova, I. V., Turubarova, A. V., & Panov, M. S. (2022). Five stages of professional personality development: Comparative analysis. *Polish Psychological Bulletin*, 53(2), 88-93.
- [27] Kölsch, S. (2022). Music processing in the brain. In: D. Jaeger, R. Jung (Eds.), *Encyclopedia of computational neuroscience* (pp. 2146-2175). New York: Springer.
- [28] Kongyratbay, T. A., Sultanova, M. S., Bekmoldinov, N. S., Ospanov, B. Z., & Kongyratbay, K. T. (2015). Study of the heritage of Korkyt in the Turkic world. *Asian Social Science*, 11(21), 55-61.
- [29] Lahdelma, I., & Eerola, T. (2020). Cultural familiarity and musical expertise impact the pleasantness of consonance/dissonance but not its perceived tension. *Scientific Reports*, 10, 8693.
- [30] Liu, X., Liu, Y., Shi, H., & Zheng, M. (2021). Effects of mindfulness meditation on musical aesthetic emotion processing. *Frontiers in Psychology*, 12, 648062.
- [31] Spytyska, L. (2023). Conceptual basis for creating a program to overcome the current fears of modern youth. *Youth Voice Journal*, 13.
- [32] Tusseyev, M., Torybayeva, J., Ibragim, K., Gurbanova, A., & Nazarova, G. (2021). Ensuring the safety of learning and teaching environments. *World Journal on Educational Technology: Current Issues*, 13(4), 1029-1039.

AUTHOR'S NOTE

Olena Y. Vereshchahina-Biliavska

Olena Y. Vereshchahina-Biliavska holds PhD in History of Arts, is an Associate Professor at the Department of Musicology, Instrumental Training and Choreography, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnytsia, Ukraine. She has many years of experience teaching the disciplines of harmony, solfeggio, polyphony, analysis of musical works, history of foreign music, history of Ukrainian music, history of art, history of culture, musical anthropology. She published two educational and methodological manuals with the seal of the Ministry of Education of Ukraine. She was a member of the organizing

committees and editors of collections of all-Ukrainian and regional conferences held at the Department of Musicology, Instrumental Performance and Choreography. Field of scientific interests: problems of regional culture, activities of religious communities in modern Ukraine, Polish diaspora and Roman Catholicism in Podillya, problems of the theory and history of art genres, the functioning of spiritual music in the modern socio-cultural space, the culture of postmodernism, the genre system of modern art. For more than twenty years, as a lecturer-musicologist, she cooperates with the Vinnytsia Regional Philharmonic, the organizing committee of the International Festival of Organ and Chamber Music “Music in the Monastery Walls”, and the Regional Scientific Library.

Irina V. Mazur

Irina V. Mazur is a senior researcher at the Department of Theory and Methods of Musical Art, Khmelnytskyi Humanitarian and Pedagogical Academy, Khmelnytskyi, Ukraine. She holds in History of Arts. She teaches the following subjects: Elementary theory of music, Solfeggio, Harmony, History of music, History of Ukrainian music, History of foreign music, Polyphony. Field of scientific interests: modern Ukrainian and foreign music, modern compositional techniques and directions of modern musical art, issues of art education, innovative technologies of the educational space, modern issues of methodology of musicology and cultural studies.

Olena P. Burska

Olesia V. Cherkashyna is PhD in History of Arts, an Associate Professor at the Department of Musicology, Instrumental Training and Choreography, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnytsia, Ukraine. She graduated from the Vinnytsia Music School named after M.D. Leontovych (department of folk instruments, bandura class), 2nd Vinnytsia State Pedagogical University named after Mykhailo Kotsiubynsky (specialty “Music pedagogy and education”); Lviv State Music Academy named after M.V. Lysenko (orchestral faculty, bandura class). She defended her PhD thesis “Opera and Ballet Theater and the State Conservatory in Vinnytsia as phenomena of national culture of the first half of the 20th century”. She completed an internship at the National Pedagogical University named after M.P. Drahomanov and foreign internship in Slovenia. She is the Head of the People's Orchestra of Folk Instruments.

Tetiana D. Hrinchenko

Tetiana D. Hrinchenko is an associate professor at the Department of Musicology, Instrumental Training and Choreography, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnytsia, Ukraine. The range of her scientific interests includes the problems of theory, methodology and practice of art education. Educational disciplines: Methods of teaching professional disciplines, Basic musical instrument, Course of professional mastery, Concertmaster's class, Chamber ensemble.

Reference According to APA Style, 7th edition:

Vereshchahina-Biliavska, O., Mazur, I., Cherkashyna, O., Burska, O. & Hrinchenko, T. (2023). Semantic aspects of musical language. *Convergências - Revista de Investigação e Ensino das Artes*, VOL XVI (32), 139-151. <https://doi.org/10.53681/c1514225187514391s.32.231>