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Music and Architectural Categories. On the Issue of Semantic Correspondences

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The article attempts to compare music terms with the categories of the architectural theory. The subject of the research comprises such key terms as tectonics and texture, pattern and setting which are conceptually defined. The position of these categories in the system of expressive means is concretized. The term "texture" peculiar for musical and architectural lexical means is specified. Certain levels of correlation between music and architectural categories are identified. As a result we admit the possibility to exceed the limits of traditional use of such terms as "musical form" and "tectonics". This focus of research is considered to be prospective, leading to the opportunity to reveal and give proof of semantic parallels on the level of structural regularities in the works of architecture and music. Basing upon the comparative method of analysis, the author suggests a new point of view on the issue of interdisciplinary researches.

Keywords: architecture, music, synthesis of arts, tectonics, construction, musical form, musical texture.

The peculiar feature of modern study of art is its interest to the integration of various arts phenomenon. Synergy and comparative studies become new schools of the second half of the XX century. They focus on the research of universal regularities in the systems of different nature, overcoming of subdivision of contemporary scientific knowledge, and working out of a unified methodological and conceptual base. Peculiarities of interrelation between arts are traditionally studied within closely related spheres such as, for example, architecture, sculpture or painting. However, the problem of search for connections between spatial and temporal arts hasn't been worked out in a

detailed way yet. The study of nature of a musical composition's spatial-and-temporal continuum finds itself in the context of the synthesis of arts problem roughly in the third quarter of the XX century. The researchers put the following question: "Why do numerous analogies spring up in the course of the development of the history of art and lead, according to R. Arnkheim, to 'strikingly similar parallels' between certain means of expressiveness in spatial arts and music, and namely between fine art of the Middle Ages with its aspiration, as S. Averintsev formulates it, to get rid of a three-dimensional world of things and monophony of Gregorian chant; between Gothic architecture and descant, one of the

forms of early polyphony; between perspective in painting and harmony in music, between key and timbre in music and colour in painting and even between the impressionists' method of mixing colours and some phonic effects in music ("vibrating sound" in Stravinsky's score, Bartok's music, etc., in particular)?" (Berger 1980, p. 61). That's why the attempt to bring the forms of manifestation of such a similarity (or isomorphism) between music and architecture into a precise system and provide a scientific proof of it is both rightful and topical.

Music and architectural works are parts of culture. They contain certain information. Architectural masterpieces, despite the fact that they belong to material objects, are nonetheless "the works of art which are consequently perceived emotionally" (Nazarova 2012, p. 60). In this regard they can be compared to musical compositions though dualism of material and spiritual origin for temporal art is not so obvious. The idea of correlation between music and architecture as spiritual and material

phenomena peculiar to a certain historic period is of a great interest. There are bright examples of the creators' conscious aspiration for a universal artistic language. The baroque epoch is marked with attraction to synthesis of arts. Italian masters contrived original forms of interaction of various arts. Thus, music and poetry, architecture and art of a theatre set were organically interconnected in baroque theatre. Landscape ensemble displayed not only the unity of plastic arts and nature but also the transfer of principles and ways of a theatre stage's space design. Academies, propagated in Italy in the XVII –the first half of the XVIII centuries and uniting patrons, architects, artists, musicians and poets, can also serve an example of such interconnection. The history of a creative union of Pietro Ottoboni (1667–1740), a cardinal (Fig. 1), Arcangelo Corelli (1653–1713), a composer (Fig. 2), and Carlo Fontana (1668–1708), an architect (Fig. 3), is not widely known. However, the result of their cooperation was embodied in a grand idea of the establishment of



Fig. 1. Pietro Ottoboni



Fig. 2. Arcangelo Corelli



Fig. 3. Carlo Fontana

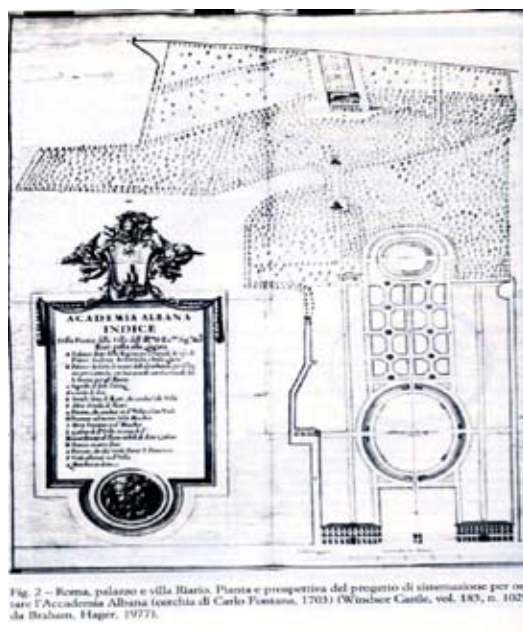


Fig. 2 – Roma, palazzo e villa Riario. Planta e prospettiva del progetto di sistemazione per ospitare l'Accademia Albana (scrittura di Carlo Fontana, 1703) (Windsor Castle, vol. 185, n. 1029 da Ibrahim, Hager, 1977).

Fig. 4. Academia Albana (Plan)

a new Academy (Fig. 4). It had to present an ideal union of all free arts: literature and painting, sculpture, architecture and landscape art, art of fencing, and, certainly, music (Arcangelo Corelli).

As the interaction between spatial and temporal arts is determined by their syncretical nature it may be stated that the topicality of the issue of synthesis of arts is permanent. One of its possible perspectives is search for semantic intersections at the level of terms. This article attempts to correlate some music terms with primary categories of the architectural theory in order to reveal their semantic correspondences.

The brightest example of inclusion of architectural words in a set of musical terms is connected with the word “tectonics”. This specific means of architectural expressiveness reflects a general character of constructive-and-spatial system by means of architectural forms and their combination. The universal meaning of this term is understood on the basis of organic interconnection of an artistic form and its construction, that

is inner logic of an installation’s structure. Similar interpretation of the architectural term correlates with one of the semantic meanings of a musical form. Peculiarities of a musical forming are also determined by interdependent position of a musical composition’s parts and their proportionality that can be conventionally showed in its scheme. Meanwhile, it is not always competent to identify a plan of the parts’ position and a musical form’s regularities. In the same way it is not always right to equal architectural form and constructive building system that can be hidden from eyes. According to A.I. Nekrasov, “real situation doesn’t always correspond to the external expression of forces of constructions” (Nekrasov, 1994, p. 226). Similar disparity is revealed at the level of a musical composition (for example, between semantic (motif) and constructive (rhythm) structure in a musical composition that is connected with a musical form’s dual nature). On the one hand, a musical composition unfolds in time; on the other hand, it exemplifies a spatial structure. It is revealing that

in G. Conus's metro-tectonic theory the distinction between semantic and constructive structures is nominated by the scholar with two terms of the so-called "integumental" and "skeletal" solidities the boundaries of which do not always coincide (Conus, 1965).

An architectural term's content presupposes the search for other musical equivalents, consonant with its meaning. Thus, the concept of tectonics is directly connected with the degree of weight and solidity of constructional materials. "Interconnection of supporting and supported parts receives its varied implementation in its bulk-and-spatial construction, in the system of segmentation of great bulks, volumes, surfaces, and plastic processing of parts" (Ocherki, 1960, p. 80). The density of a site development is also taken into account in an architectural ensemble. Thus, such main and additional means as space, mass, density, size, texture are involved in creation of a tectonic image of an architectural work of art. The picture of their correlation reveals an emotional aspect of an architectural ensemble, demonstrates the combination of various elements in the whole construction, their connections, the feeling of lightness or heaviness of the whole. The enumerated parameters of mass, density, volume also integrate into a semantic field of such a means of musical expressiveness as texture. It becomes quite obvious that the possibility to explain terminological parallels is not exhausted with the field of musical forming.

A musical composition is a multi-level system of various expressive means. Musical texture fulfills an important forming function among them. Besides, the field of texture also comprises the problems of musical texture organization as a sound, being elementary material of music, possesses certain physical properties. A composition's material side is actualized in a "stream of sounds" (Tiulin): conceptions of mass and density, voluminosity and configuration of

sounding arise. In this respect the concept of sound texture (or musical texture) agrees with the concept of texture borrowed from the sphere of plastic art¹. In the theory of an architectural composition it means a physical property of the material (surface) the author works with. However, the aspect of their functioning is different due to a certain specificity of temporal and spatial arts. Thus, sound texture as one of the components of the system of expressive means functions at the level of a musical text. As for an architectural composition, all its expressive means are a priori material (excluding space). Musical texture actualizes musical-and-psychological images; while the means of an architectural composition are visual-and-tactile (the material's texture is smooth, ribbed, etc.). It should be added that texture, presenting a certain type of musical texture in its various manifestations, implements an emotional-and-sensory level of its perception. Various factors are taken into account at that: mass of its sounding, its volume, structure (or configuration) and density.

The mechanisms of composition of sound texture's various components (sounds, lines, voices) into the whole are considered at a logical level of musical texture and setting. In the theory of musical texture these categories also present different aspects of functioning of a musical whole. But at the same time they are closely connected. Summarizing the mentioned above, it can be stated that a characteristic feature of the "musical texture" category is its structural properties. These are represented in the unity of constituting and subordinated concepts: musical texture –setting –texture. Each category functions at a certain level of a composition's organization. "Texture is a **substance** at the level of which fixation of under-lying prosodic processes, "objectification" of functional-and-logical relations of a musical text's elements take place" (Aleksandrova, 1992, p. 91). The meaning

of an architectural term doesn't imply such structural properties. At first sight such terms as "the mode of presentation", "a concrete form", "and structure" coordinate with the semantic meanings of the architectural term "texture". However, a semantic range of a musical term is much wider. Firstly, the category of musical texture in the system of musical expressive means doesn't only cover the question "what" but also that of "how is the organization of all its components fulfilled". Secondly, musical texture is "an artistically reasonable three-dimensional musical-and-spatial configuration of sound texture, differentiating and uniting the whole set of components vertically, horizontally and in-depth" (Nazaikinskii, 1982, p. 73). Thirdly, musical texture takes into account each element's functional role and behaviour as well as their correlation. In the theory of architecture this term is unidirectional in its meaning and takes the "place" of the material (or means) for creative work in the general system of categories. All this gives grounds to assert that these concepts do not coincide systemically. The position of this category in the system of musical expressive means, its semantic complexity connected with a variety of the category's functions, as well as its structural properties and a specific role of an "artistic organizer" of a musical space prevent from bringing it into correlation with the concept from the sphere of architecture that seems to be synonymic to it at first sight. In terms of texture's architectonic function and its implementation at emotional-and-sensory and logical levels semantic parallels are built with the architectural term "tectonics".

K. Bettikher, a German historian of ancient architecture, was the first to use this term which he defined as "reality that doesn't only bring forming into the stark material needs but also raises this forming up to the level of an artistic form" (Ikonnikov, 1986, p. 61). The term's semantic

meaning was concretized and became wider later on. It integrated appropriateness regarding a form's functions and expressiveness regarding its implementation. Tectonics artistically changes a construction but is not similar to it. Texture is a result of an artistic processing of a sound matter. Tectonics refers to outer expression of an architectural work of art, evokes a person's sensory-and-emotional response. Being a composition's "front side" (Nazaikinskii), musical texture "materializes the idea of setting", develops a sensory-and-emotional image of a musical composition. A construction functions inside a building, it is hidden from eyes and is a building's inner structure, logic of building. A setting in a musical composition determines inner logic of its structure, the structure of musical texture. "Setting is an invariant of musical texture's structure: it is of a sort of a general plan of constructing the whole texture" (Titova, 1992, p. 21).

The given definitions are united into the pairs of musical and architectural concepts consonant to each other: **Texture –Setting** and **Tectonics –Construction**. Their correlation can be clearly seen in the table. The common denominator, uniting these terms, is the category of space.

Musical categories	Levels of functioning	Architectural categories
Sound texture	Material Music text/ Material	Texture
Texture	Emotional-and-sensory Audio/Visual Outer	Tectonics
Setting	Logical Inner	Construction

The presence of three coordinates (a vertical line, a horizontal line and depth) in texture provides the grounds for searching for the analogy with spatial arts, associating specific peculiarities

of sounding with manifestations of object environment. The reason of impossibility of literal correlation is in the following: in music the depth coordinate is often ephemeral whilst conspicuity of three dimensions is a base of any architectural composition. In music this dimension is the most ambiguous. Hence, texture can integrate virtual and real space by means of division of musical instruments or chorus groups within the space of a concert hall or cathedral. Perception of depth can be quite evident for ear while its analytical evaluation unfolds a composition's semantic meaning. Volume dynamics and degree of remoteness of a sounding source favour the division of texture into planes such as relief (near) and background (distant) ones. It is this aspect where numerous metaphoric terms appear. "Front", "back", "middle", "perspective" are among them. Due to texture's three dimensional structure various components are differentiated in musical texture. They are lines, strata, layers, "floors". According to a vertical coordinate there are upper, lower and middle ones. According

to a horizontal coordinate such components as accords, chords, texture cells are distinguished. In E. Nazaikinskii's opinion syntactic and compositional differentiations come in force here (Nazaikinskii 1982). Diagonal is another special coordinate for a musical composition. It is evident in sounding and musical notation of Arcangelo Corelli's Concerto grosso №7 (Fig. 5):

The idea of integration of several schools was embodied in the architecture of the Palazzina di caccia of Stupinigi by Filippo Juvarra, a famous architect of Italian baroque (1678-1736) (Fig. 6).

The attempt to correlate musical coordinates with the system of three dimensions in architecture is presented below.

Architectural volume is correlation of height, width and depth. Vertical (as per height) and horizontal (as per width) segmentations arrange the elements of an architectural form and reveal the differences between them. Thus, vertical segmentations make it possible to distinguish a building's top and bottom, their interaction and subordination as per weight. Horizontal

The image displays a musical score for the first movement, Allegro, of Corelli's Concerto grosso №7. The score is arranged in two systems. The first system includes staves for Violin I (Viol. I), Violin II (Viol. II), and Violoncello (Vc.). The second system includes staves for Violin I da rip. (Viol. I da rip.), Violoncello (Vc.), and Contrabasso (Cb.). The music is written in G major (one sharp) and 3/4 time. The Violin I part features a prominent melodic line with eighth-note patterns and a more complex, rhythmic passage in the later measures. The Violin II part provides a steady accompaniment of eighth notes. The Violoncello and Contrabasso parts play a consistent eighth-note bass line. The Violin I da rip. part mirrors the Violin I part.

Fig. 5. Concerto grosso №7 Allegro



Fig. 6. The Palazzina di caccia of Stupinigi by Filippo Juvarra

segmentations enable to limit the surface in the same direction and compositionally emphasize a dominating part. One of the conditions of depth is connected with segmentations of architectural volume according to these two coordinates. It also depends on the conditions of perspective or, in other words, on a form's position in space and its remoteness from a viewer. They distinguish an architectural form's position in depth, in general front, in front of other forms. (Let's remember the division into relief and front planes in a musical composition.) The forms which are near a viewer are perceived clearly, distinctly, as relief ones. As the distance becomes greater the details start disappearing, forms' voluminosity and relief gradually turn to flatness and silhouette-like, clarity of colour correlations becomes less, colour saturation is absorbed..." (Krinskii, Lamtsov, Turkus, 1968, p. 112). Thus, depth as a form's feature manifests itself in dynamics and depends on a viewer's motion in space or his active visual perception (various trajectories of the gaze motion, noticing significant details). Division into texture's planes in music can be comparable

with various positions of an architectural form in space. Common psycho-physiological sets (active work of aural sense tracking all the travels of motif similarly to the work of eyesight) enable to reveal correlations between three-dimensional systems in music and architecture. The statements above can be presented in the form of a table.

MUSIC	ARCHITECTURE
<i>Coordinates</i> Vertical line, horizontal line, depth	<i>Coordinates</i> Height, width, depth
<i>Components</i> In vertical line: bottom, top, middle lines, strata, layers, "floors", "tiers" In horizontal line: texture cell In depth: relief and background planes ("front", "back", "middle")	<i>Segmentations</i> In vertical line: a building's bottom, top, middle elements In horizontal line: floors, tiers, cells (motifs) as a building's dominating parts In depth: front plane, plane in depth, general plane.

Mass, density and volume are a sound matter's object features. They are modeled by

a co-action of a whole set of musical expressive means: register, timbre, accents and articulation means, volume dynamics. Choice and conditions of their combination determine the appearance of auditory sensations –light or complicated, lessened or compact sounding. The concepts of mass, density and volume are the main in the theory of architecture. These properties of architectural forms manifest themselves to different extent. Visual perception of lightness or weight is formed due to certain distribution of masses and character of expression of constructive elements' work. For example, a wall's surface, treated with large rustic stone, forms a visual sensation of solidity. As these features specifically manifest themselves in music and architecture, their comparison is to some extent conventional. Nevertheless, basing upon propositions by I.I. Snitkova (Snitkova, 1991), V.F. Krinskii, I.V. Lamtsov and M.A. Turkus (Krinskii, Lamtsov, Turkus, 1968), it's worth while comparing the semantic meanings of the concepts "mass", "volume" and "density" in music and architecture.

Properties of sound texture	Name	Properties of architectural forms
Depends on the number of voices and sound volume.	Mass	Depends on visual evaluation of quantity of an architectural form's material.
Depends on the difference of musical texture elements: melodic line, sound line, sound "point", etc.	Volume	A form's geometrical type when all three coordinates are equal.
Characterizes the intensity of sound effect. Correlation between mass, sound structure and sound volume dynamics are taken into consideration. Limits: lessening or compaction of texture.	Density	Characterizes the intensity of filling a form or territory. Limits: minimum (lessened) and maximum.

All three properties are connected with a sound's physical nature. Thus, they can be peculiar not for musical texture only but for any of its elements. Object properties of a sound, (musical texture) correlate with main properties of spatial forms. The presence of a quantitative factor attracts at both analytical evaluation of sounding mass and visual description of property of architecture. Proximity of a semantic meaning of the concept "density" in music and architecture is connected with the intensity measure and termed with such synonymic words as "lessened" –"compact".

As it has been mentioned above, the "volume" parameter is connected with a specific, "non-evident" manifestation of the "depth" coordinate in musical texture. It can be suggested that possible semantic intersections will be connected with the concept of sounding structure. The term suggested by I.I. Snitkova means the degree of texture homogeneity or material's "stratification" and depends on a definite pattern, (ornament) of voices (Snitkova, 1991). The researcher considers that ornamentation and "décor" means play a decisive role here. Emphasizing the expression "pattern", (contour) of voices as the main one, it is possible to notice a semantic correlation between the musical term "texture pattern" and the architectural term "texture". The latter means an ornament formed on the material's surface by spots, lines and stains.

As for musical analogies of such architectural properties as chiaroscuro and colour, they base upon associative relations to a greater extent. "Sometimes spatial-and-visual associations are evoked not so much by "the motion" of texture voices as by a certain "visible" brilliance of sounding: they are reflected in the descriptions containing "colour" and "light" metaphors even" (Skrebkova-Filatova, 2001, p. 23). Numerous metaphoric comparisons are of

principal for the range of problems in the theory of texture as they corroborate the originality of such concepts as “musical colour” and “light”. The study of mechanisms of their embodiment in music and architecture is beyond the limits of this article and can be an issue for an independent research.

Summarizing the mentioned above, it can be pointed out that the comparison of two theoretical systems enables to:

1. Corroborate the universal character of basic concepts (“tectonics” and “texture”);
2. Regard the possibility of establishment of semantic parallels between the features of a musical texture’s three-coordinate structure and the main parameters of architectural volume measurement;

3. Demonstrate direct correspondences between status and position of certain definitions in the system of classification of features and means of expressiveness.

The dialectics of interaction of motion and quiescent state that manifests itself in both music and architecture but to a different extent was once worded in such widely-known metaphors as “Music is a melting architecture” or “Architecture is a frozen music”. Comprehension of a musical composition’s spatial nature changes the context of these phrases and without prejudices reveals semantic parallels both at the level of terms and at the level of structural regularities of architectural works and musical compositions permitting the latter to be the subject of an independent scientific research.

¹ The term ‘sound texture’ was first distinguished as an independent category by Iu.N. Tiulin (Tiulin 1966). Dwelling upon such peculiar features of musical texture as length and volume of sounding, the researcher transfers this term from a group of metaphors to an independent theoretical category.

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Музыкальные и архитектурные категории.

К вопросу о смысловых соответствиях

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В данной статье предпринята попытка сопоставления музыкальных терминов и категорий архитектурной теории. В качестве предмета исследования рассматриваются следующие ключевые понятия: тектоника и фактура, конструкция и склад. Определены смысловые значения данных дефиниций. Конкретизировано положение этих категорий в системе средств выразительности. Уточняется значение понятия «фактура», которое применяется в музыкальной и архитектурной лексике. Устанавливаются возможные уровни соотношения музыкальных и архитектурных категорий. В результате допускается возможность выхода за рамки традиционного уподобления терминов «музыкальная форма» и «тектоника». Данное направление исследования перспективно, позволяет обнаружить и обосновать смысловые параллели на уровне структурных закономерностей произведений зодчества и музыки. Используя компаративистский метод анализа, автор предлагает новый взгляд на проблему междисциплинарных исследований.

Ключевые слова: архитектура и музыка, синтез искусств, тектоника, конструкция, музыкальная форма, музыкальная фактура.
