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A GAME OF MIMICRY – MIMICKING A GAME
A CONVERSATION WITH TATJANA MILOŠEVIĆ

Tatjana Milošević (1970, Vranje) earned her bachelor's and master's degrees in composition from the Faculty of Music in Belgrade under the supervision of Prof. Zoran Erić, who also supervised her DMA project – a chamber opera titled *Who Killed Princess Mond?* – accepted in 2013. Today she is a full professor of composition at the same institution. Since 2009 she has also taught composition at the Academy of Art in Banja Luka. As a visiting professor, she has also taught at Old Dominion University in Norfolk, Virginia (USA). She was a lecturer and member of the jury at the 15th Young Composers Meeting in Apeldoorn (Netherlands).

Tatjana Milošević
(Photo by Zoran Savić)

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Works by Milošević have been performed at numerous major festivals, events, and concerts of contemporary music in most countries of Europe, the United States, South Korea, China, as well as Serbia and neighbouring countries (International Review of Composers, BEMUS, NIMUS, BUNT, SAXperience, Music Biennale Zagreb, Groeten uit Arnhem, International Week for New Music Bucharest, International Music Festival Romania, Piano Risuonanze, Nieuwe Hollandse Waterlinie 2001, Music Harvest, Nuovi spazi musicali, Autumn Music Festival in Skopje…).

Milošević has collaborated with renowned performers and ensembles from Serbia and abroad: the RTS Symphony Orchestra, Belgrade Philharmonic Orchestra, St. George Strings, Construction Site New Music Ensemble, Trio Pokret, Trio Singidunum, Ensemble Metamorphosis, Collegium Musicum Academic Choir, Belgrade Baroque, Tea Dimitrijević & Dejan Subotić Piano Duo, Het Trio (Netherlands), De Ereprijs (Netherlands), Creo (USA), Trio Clavino (USA), Ensemble Devotio Moderna (Romania), Nada Kolundžija, Bojan Sudić, Ljubiša Jovanović, Steffen Schleiermacher (Germany), Adele D'Aronzo (Italy), José Luis Granados (Spain)…

From her extensive oeuvre, one might single out the following works: *Sjaj Betelgeza ili tajna crvenog džina* ("The Splendour of Betelguese or The Secret of the Red Giant") and *Šetnja sa Rinom* ("A Walk with Rina"), two chamber pieces with which she represented Yugoslavia and then Serbia at the 1997 and 2018 ISCM World Music Days festivals in Seoul and Beijing; *Buzzle*, premièred in 2000 by Dutch pianist Marcel Worms at BIMHUIS, a jazz venue in Amsterdam; *Spyro,* premièred by Zagreb String Trio at the 2002 Bemus festival; *CoinciDance,* a ballet performed by Orkest De Ereprijs at the 2009 *Groeten uit Arnhem* festival in Arnhem (Netherlands); *Green with Buzz* and *Ludus Mimesis,* two symphonic works; the chamber operas *Who Killed Princess Mond?* and *Hadži-Pantelijin šnajderaj* ("The Tailor Shop of Hadži-Pantelija"); *Random,* performed at the 2017 pianoRISUONANZE in Trieste; *Dok mislim na tebe* ("Whilst Thinking of You") for piano and string orchestra; the mini-opera *Adonis and Galatea…* With support from UNESCO, in 2001 she took part in "Waterproof", a project that included a performance and the release of her electronic piece *Tribute for Fort Honswijk.* She is also active in the domain of incidental music (the short film *Glumčevo brdo* – "The Actor's Hill", the documentary-feature film *Dribbling and Cooking*, and the plays *Victor* written by Roger Vitrack and *The Wizard of Oz* directed by Aleksandra Glovacki).

Tatjana Milošević has won the following awards: the September 7th Award of the City of Vranje for outstanding contributions in the field of education and culture; Third Prize at the 4th International Composers' Forum in Belgrade for *Sjaj Betelgeza ili tajna crvenog džina* and Second Prize at the Gradus ad Parnassum International Competition for Students of Composition in Kiev, both in 1995; First Prize at the 7th International Composers' Forum in Belgrade in 1998, for *Ludus Mimesis,* in the students category; and two Vasilije Mokranjac Awards of the Faculty of Music in Belgrade, for *CoinciDance* (2003) and for *Green with Buzz* in 2008.

I'll start this conversation with your piece Ludus Mimesis[1] *for symphony orchestra, written in 1998, whose title you translate as* Igra podražavanja *("A Game of Mimicry"). For, it seems that this title is precisely the key for understanding your artistic procedures in many of your subsequent pieces – for you, composing is a game, involving communication with your entire musical heritage and environment, which often resonates in your music and which you treat according to the archival principle, but in part, it is also about mimicking, imitating… What sorts of doors are opened by* Ludus Mimesis*?*

Indeed, *Ludus Mimesis* does provide the key for understanding some artistic procedures that I still like to employ in my work. In this piece, *mimesis* appears for the first time as the main means of expression, combined with other techniques of composition in order to avoid eclecticism, incompletion and/or incoherence – phenomena that often appear in works composed by using the mimetic procedure.

Although *Ludus* consists of segments titled after various mythological characters (*The Dance of the Argonauts, Satyrs in Arcadia, Leda and the Swan, The Awakening of the Phoenix, The Sea of the Nereids*), the conceptual basis behind these games of mimicry is not the mimesis of ancient myths, nor is it about evoking works inspired by those myths. These mythological associations are only a stimulus for what follows. Above all, these games of mimicry refer to compositional procedures (for example, Ravel's), motor rhythms (for instance, Bartók's), orchestration (for example, Debussy's), poetics (for instance, Stravinsky's), macro-formal design (for example, Messiaen's), *rubato* involving exotic wind instruments (for instance, Far Eastern singing)… I worked hard to have the degree of mimicry involving the models mentioned above cover a wide range – from hints to paraphrases – invariably seeking to

[1] https://www.youtube.com/watch?v=TFXGCerJCJg&t=57s

pull the listener into a vortex, whether big or small, of associations and recognitions, without resolving the dilemma whether it's something 'old' in a 'new' way or something 'new' in an 'old' way. The musical material of *Mimesis* is entirely original. Two leitmotivs, which dominate the work, have been very significant in my subsequent work as well: the first involves a repeated note permeating the entire work, at different tempi, with or without an echo, whether on a single pitch or being part of a complex vertical sonority; the other one is the way I treat high-pitched sonorities, which, by the degree of their presence in the overall flow of the piece and the orchestration procedures applied in it, acquire a special functional role in order to supply the work with a specific leit-timbre of its own.

When I wrote it, the title of the piece was contested by some, because those two words, the first of which is in Latin, the other in Greek, are both in the nominative case, but, eventually, it was accepted. The title has also been translated as *Podražavanje igre* ("Mimicking a Game"), but given that the basis of the piece is mimicry in general, not just mimicking a game, that other rendering is, in my opinion, more pertinent.

In your compositions, there are different layers of music running side by side, emerging and vanishing, like in a dream of sorts, the past and the present wrapped around each other. In your work Chatatutu[2] *for flute, violin, and piano, the main musical material you worked on came to be by imitating birdsong, evoking the poetics of Olivier Messiaen. One also hears overtones of Debussy's* Prelude to the Afternoon of a Faun *– in the material of the piece, the atmosphere, the emphasis on timbre. There is also reference to the baroque era in baroque motoric rhythm. How do you choose what type of music to address in a particular piece?*

I think it is the instrumentarium that for the most part determines what type of music I'll address. *Chatatutu* was commissioned by Ensemble Singidunum and thinking about the sound of a flute, violin, and piano spontaneously summoned from my memory the evocations you mention. Likewise, working on my first electronic piece, *Tribute for Fort Honswijk* from 2001, stimulated me to think about different musical materials corresponding with one another, their multiple layers and dimensions, so-called 'poly-musicality'. In his *Letters to Myself,* the composer György Ligeti explained the phenomenon as follows: "Behind music there is another music, and behind it yet another

[2] https://www.youtube.com/watch?v=wHV3TIZS4zo

music – an endless perspective, like viewing oneself in two mirrors, producing an infinite number of reflections".

The material for Chatatutu *was obtained by extracting a layer from* Ludus Mimesis*. Do you often go on working with the same material in multiple compositions? Is that another way of presenting your view of music as an infinite kind of weaving?*

I resort to using the same thematic materials in multiple pieces when I think that reflecting on a chosen musical idea, its quality, re-examining its usefulness, its development, trying out new combinations of sound might lead to different formal, thematic, timbral, and textural results. The material in *Chatatutu* you mentioned is the opening theme from *The Awakening of the Phoenix*, the fifth play [*igra*] in *Ludus Mimesis,* representing the start of developing a different musical flow. I made a further step in the same direction in *Šetnja sa Rinom*. That piece is entirely based on the leit-theme of Rina, the main heroine in my ballet *CoinciDance*. Since its form is a variation, I didn't insist on varying the developmental quality of the opening material, but, rather, on depriving it of its original emotionality and sonority. I think that in the end I managed to 'breathe' into it an entirely different identity.

In Chatatutu*, there is a notably consistent level of control in terms of organising the material and working with its musical parameters. Is the notion of play in music partly about toying with one's system of composition with the intent of constantly finding new solutions?*

In my view, the stuff that a work of music is made of is not immediately a piece of musical content itself, e.g. a series of particular tones or chords, or a specific rhythmic formula and the like, but the principles you follow in developing a given musical content. In other words, the work's concept is not determined by its thematic material. The concept of a work is determined by the way it's shaped, the way its medium is treated, as well as the means of its realisation. That is why I think it's very important to devise, before you start composing, systems for organising the material, and to examine its overall potential. Also, I never use readymade models (whether mine or other people's) in organising the material and treating the musical parameters, but prefer to create them with reference to my initial compositional idea. I think that every idea entails its own means of realisation, a composition technique that will best materialise that idea, and an adequate system for organising its mu-

sical parameters. In that process, one of my chief aids is play, as well as musical intuition.

Do you see compositional technique as a means that, by way of using it in various ways, may yield significantly different results in terms of aesthetics and expression?

Yes, definitely. Compositional technique may define one and the same content as dramatic or lyric, consonant or dissonant, static or dynamic (in the broadest sense of each one of those categories). And not just that. If my favourite compositional procedure, which might be defined as *modulated repetitiveness,* were applied to contrasting thematic contents, the final sound result might feature a total 'equalising' of their differences. Conversely, different compositional techniques might offer great possibilities for developing an extremely simple model, e.g. one based on a single tone, in widely contrasting ways. That suggests that compositional technique may play a decisive role in the aesthetic experience of a work of music. If a work of music is to engage in aesthetic communication with its audience, it must be coded in a way that will enable it to impart its desired message. Compositional technique enables the author to make sure that her idea be coded in such a way that her piece will be received as broadly as possible, or at least that a single, primary layer of its meaning will be received. If that doesn't happen, aesthetic perception of the work will be made much more difficult, perhaps even impossible. I have learnt that from personal experience. As a student, I typically worked with complex structures in quick successions; therefore, I tended to blame the oscillations in the communicative perception of my music on its excessive complexity and the listener's inability to appreciate it. The real reason is the absence of a hierarchy in the perception of multilayered events. Nowadays, with an improved knowledge of compositional techniques, I'm able to separate the layers and thus enable the listener, who may not be familiar with contemporary music, to discover a most striking kind of meaning even in places where the amount of information per unit of time reaches a critical level. On the other hand, an informed audience familiar with contemporary art will be able to identify much deeper meanings.

Chatatutu *has another peculiar trait: the relationship of the flute and violin parts, which are in a sort of delay and micro-variation, generates, in the listener, the illusion of a large space. How important to you is the spatial shaping of sound?*

This is very important to me and I usually define it whilst generating the work's thematic material. For every composition I make, I devise an individual spatial framework. In *Chatatutu,* I wanted to produce a kind of sound that would 'behave' as though it were coming from a room with an echo or from an aura created uniquely for that occasion. I was able to do that, primarily, thanks to an extremely high degree of homogenisation in the thematic material and an atypical treatment of the violin, which for the most part imitates the flute part, as well as owing to micro-varying and sporadic micro-polyphony, which offer ample possibilities for spatialising sound. By contrast, in a piece titled *Ka zvezdama* ("To the Stars") for accordion and strings, I approached the spatial shaping of sound in an entirely different way. In that piece, the performers are mostly treated like a 'band', and the sound they produce is extremely 'flat', with no illusion of a deeper space. I also like to resort to orchestral approaches that (merely) sound like jazz instrumentation, as well as to mimicking the discharges of energy experienced by performers of free jazz, who often produce physical sensations that are unbearably intense, often losing the sense of the spatiality of sound.

Moving across musical space-time, where every observer perceives and sees a different segment of what is actually a unified entity, you also made the piece Dok mislim na tebe *for piano and string orchestra. What is the object of play in that work?*

That work explores the compatibility of original thematic material with a transformed quotation from Scarlatti's Keyboard Sonata in D minor (K 213). Isolated from its original context and placed in a new one, the Scarlatti quote becomes a constitutive element in the creation of a different musical language. Its new 'energy matrix' slowly emerges by melting with new, original music, which naturally leads to a gradual blurring of the baroque music reference. In this way, baroque musical features are gradually transformed to a new 'materiality' of musical contents, but without discarding the memory of the original context. Like in other pieces of mine, the musical flow proceeds without an explicit dramatic conflict, instead foregrounding lyrical and meditative events. This notable absence of drama presents the status of incessant play, first initiated in *Ludus Mimesis* (the so-called 'ludic condition'). Metaphorically speaking, *Dok mislim na tebe* represents the dichotomy between the traditional and the innovative, the real and the astral, the old and the new… At the same time, none of these worlds are explicitly represented in the piece, but only implied.

You have shown your interest in vocal music and opera in five pieces: Ko je ubio princezu Mond, Adonis i Galateja, Kada te ostavi onaj koga voliš *("When You're Left by the One You Love"),* Hadži Pantelijin šnajderaj*, and* I am That. *When I did some work on chamber opera (and some other vocal works), I came to the conclusion that really to modernise that genre, one would need to redefine precisely the vocal parts, since it is not enough to surround the voice with novel solutions in the ensemble, but rather, one would need to find a peculiar type of expression precisely in the voice, of the sort one notes, for instance, in [Salvatore] Sciarrino's music. Vocal treatment in your compositions acquires a peculiar dimension because the parts often move in wide leaps and broken rhythmic patterns, deviating thereby from usual, conventional tuneful vocal writing [pevnost]. What is the status of the voice in your vocal endeavours?*

I'm glad you mentioned Sciarrino's vocal expression because the status of the voice in my vocal compositions is closely related, among other things, to textual and dramatic clarity, which is an imperative for Sciarrino.

When I make my vocal parts (disregarding my student works), **I do not begin** by supplying each character with a wealth of thematic material, a thematic profile of their own, having them sing all the time, or exchanging lines with other characters in a chronological fashion. Quite to the contrary. Regardless of what kind of characters they are, how many of them there are, regardless of their relationships, etc., I usually place them in un-contradictory thematic frameworks that are characterised, as you described them, by melodic and rhythmic fragmentation, as well as 'stuttering', 'recollecting', 'interrupting', 'prattling', generating latent polyphony… These kinds of frameworks, depending on the degree of variation, transformation, fragmentation, are a personification of widely divergent states and emotions. Working on vocal parts in a thematically consistent way, almost without contrasting contents, broken up by rests and constantly varied, has taken me to a kind of vocal melodic writing that might best be described as *amorphous through-composing,* one that is, it seems, slowly becoming my 'trademark'.

You're active in applied music as well, especially in the genre of documentary film. How far do you diverge from your usual way of composing and how willing are you to transform your musical 'language' in order to furnish images with sound?

I'm equally interested in composing applied music as I am in composing contemporary classical music, probably because in both types of music I'm very

much into quotations, paraphrases, and simulations, exploring and reviving the music of the past, crossbreeding different genres and styles. The transformation that my musical language undergoes in order to add sound to images is instantaneous. I easily remodel myself into a ('minor') classical composer, impressionist, romanticist, composer of ambiance music… The most recent film for which I composed music was *Pečat braće Ljubavića* ("The Seal of the Ljubavić Brothers"), directed by Slobodan Simojlović, about the printing press of Goražde. The instruments, motives, and harmony of 16th-century music served as a starting point for creating an entirely authentic musical content that, sometimes more, sometimes less so, echoes the sound of the Renaissance. In several items I did a gradual metamorphosis of symbols from an 'old' musical language into another, utterly contemporary language, which is one of the artistic procedures I've been exploring elsewhere in my work. Applied music has its own laws, but that doesn't mean it can't be creative, fresh, and effective.

You've been active in pedagogy for a long time now. You're a professor of composition at the Faculty of Music in Belgrade, the Academy of Art in Banja Luka, you were a visiting professor at Old Dominion University in Norfolk, Virginia (USA). With your already considerable experience in pedagogy and having taught a large number of students, would you be able to answer if I asked you what it possible to teach a student of composition?

Perhaps it might be easier to answer what is impossible to teach a student of composition? Having taught students for a few decades now, I'm convinced that one cannot develop a feeling for musical time by learning. That is exclusively a matter of talent. How long can you persist with a given body of musical material, when is the time to go for something contrasting, when should you insert a break, when is the time to end the piece? Unwarranted and pointless breadth is the best indicator of lacking this gift. You can work on everything else, including personal taste, but this is the one thing that you cannot learn.

What do you believe in when it comes to music?

I believe in finding a link between modernity and the continuity of tradition. I believe that what people have already discovered in the music of 'the past' may be reshaped into a new work, many times over, in new ways. In that sense, there is no contradiction between the present and the past. For me, it's

a real adventure to find hidden links between different musical genres, styles, techniques, as well as to choose elements for creating my own 'stylistic hybrid', whose integrity, functionality, and uniqueness will turn it into a 'new type'. I'm not interested in random encounters between musical references of different origins, or in creating poly-stylistic collages. What really intrigues me is creating a functional system that might forge a valid relationship between **its own** matter and energy. In that sense, I have developed specific compositional procedures that allow me to move easily from one creative 'orientation' to another. Deciding how to represent these differences is only limited by my personal taste and intuition.

Translated by Žarko Cvejić

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MELODIC MODELS AND MODELLING – THE FUNDAMENTAL SYSTEM OF KNOWLEDGE ACQUISITION IN MUSIC

Abstract: In the pursuit of developing a fundamental understanding of terms, phenomena, rules and meanings in music, vital to the performance and interpretation of a musical work, it is necessary to apply a methodologically grounded system to the reading of a score that efficiently establishes a basis for understanding the musical content and contributes to the development of musical abilities and musicality more broadly. In the musical-pedagogical process, as part of the wider set of music disciplines (harmony, counterpoint, music forms, knowledge of music styles), the most crucial are the methods and systems of work which allow the reading of musical notation and the understanding of a musical piece to be generated and profiled. The system of *models and modelling* is a form of work about the perception and reception of a musical work composed on a musical model and the process of working with that model, i.e. modelling. The complexity of the system is reflected in the two sub-elements of modelling: the development of associative abilities by recalling the sound of the model, and gaining an automatic response to sound. Until now, work on models and modelling has been treated using a musical-pedagogical approach. In this study it is defined as a system which is applicable to the process of reading and interpreting

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a musical text, without being predicated on musical style or the tonal bases of music.
Keywords: system, notational text, understanding of musical content, model – modelling, association, automatism

Solfeggio,[1] broadly, encompasses all known forms of reading music notation, understanding musical content, performing music (vocally and by naming tones in solmization), and writing down an understood and memorised music sequence. It represents a methodologically grounded musical-pedagogical process of working on understanding music as a set of music disciplines (harmony, counterpoint, music forms, knowledge of music styles, etc.), music text and meaning in music. It takes place in the context of the eponymous educational subject at all levels of music education in a number of European countries (France, Russia, Bulgaria, Bosnia and Herzegovina, Montenegro, Croatia, etc.) and Serbia. Of crucial importance are the methods used to generate this understanding, and especially the way it is transmitted and further profiled. In addition to methodological exposure, in the process of gaining functional musical literacy, during systematic musical education, future professional musicians are exposed to different approaches towards music content.

Generally, methodological inconsistencies and errors that appear and indicate an informal understanding of Solfeggio as a subject and a discipline lead to a lack of understanding of certain elements in the fields of melody and rhythm. This is generated over time and (much like a continuously repeated mathematical error) the collection of unclear terms, phenomena and rules of music and their relationships progressively grows. The tendency towards the fragmentation of knowledge leads to the fragmentation of abilities and methods of gaining new knowledge, so the process of learning must, sooner or later, be restarted, renewed or updated to fill in the gaps with meaning and an understanding of musical content.

The above mentioned isn't a rare phenomenon so for the purposes of understanding, or rather fundamental comprehension of the terms, phenomena, rules and meaning of music, a branching approach must be taken, returning to the roots of musical education and systematically filling in the missing pieces.

[1] The term "solfeggio" has multiple meanings. In addition to denoting the subject in systematic musical education, it's a music-pedagogical discipline, i.e. a phonic system of reading a notational text or stave by naming tones (solmization).

This requires a methodologically grounded system which efficiently lays the groundwork for the understanding and knowledge of music and creates a reinforced foundation for not only the understanding of music as an art form but also a basis for further development, or rather building up of musical abilities, as well as musicality more broadly. Teleologically speaking, in the context of "understanding the goals of an action, or the set of activities aimed at achieving a set goal",[2] work in a developed system should be directed towards achieving the goal of teaching music literacy—creating functionally musically literate individuals.

A system generally represents a "complex and functionally atomic whole (structure) consisting of a number of mutually interconnected parts, with established functional connections and relationships between them, which govern the ways in which the structure will function as a system".[3] The relationships established between those parts determine the way the whole structure will function, as well as its individual components within the larger whole. When talking about a system in the sense of a model and modelling in the field of musical knowledge acquisition, the specific, methodologically grounded work on developing musical literacy, comprising the musical model and the process of working on that model—modelling—creates a sort of binary system that is fundamental to musical education. The connection that exists between two elements (model and modelling), the function established between them and the goal of their use in the process of forming a musically literate individual is the defining property of the structure of this system. The complexity is reflected in the two sub-components that make up the modelling process—the development of associative abilities through recalling the sound of a model and gaining an automatic reaction to sound.

1) Models → 2) Modelling

↓

2a) development of associative abilities

↓

2b) gaining automatic reaction skills

[2] Радован Антонијевић, *Утемељење система знања у педагогији*, Београд: Филозофски факултет Универзитета у Београду, Институт за педагогију и андрагогију, 2014, 74.

[3] Ibid.

And so, the process of modelling (associations and automatisms) is a sort of subsystem, and simultaneously a symbiotic part of the wider models-modelling system. Associations (with a specific melodic model) and automatisms (unconscious, rapid sound recall) can be isolated from the wider system and from the subsystem, and observed independently of them, with the caveat that they do nonetheless arise from the *models-modelling* system and its structure, context and methodological purpose.

The term "model" has multiple meanings, and can be interpreted from multiple aspects within the sciences and humanities. In the original meaning, a model (Latin *modellus*, French *modèle*, Italian *modello*) is the basic pattern that describes a thing, i.e. a definition or description, a notable example or the crucial factor that determines the aim and purpose of certain phenomena or objects.[4] In the more specific meaning of the word, the model is the blueprint, pattern or scheme according to which something is created or which it is based on.[5] One of the meanings within musical art regards the term as related to the process of composing, or, as noted by Mirjana Veselinović-Hofman: the process of "a compositional-technical procedure for the purpose of creating a new context".[6] In composing practice, there is a distinction between the terms pattern, model and basis, which are, in written texts on music, all used "with their own meaning".[7] The musical pattern is, then, a characteristic piece of musical material that "represents the context it is derived from", and is therefore akin to a fragment or an excerpt "a part of a composition which is introduced to a different, new composition, as a building block".[8] Furthermore, a pattern "subjected to a compositional-technical procedure for the purpose of creating a new context" becomes a sort of "*model* for work".[9] Finally, Veselinović-Hofman defines a basis as "a model that is not worked with as specific content, but certain rules of which are visible [...] within the composer's own individual expression".[10]

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[4] Иван Клајн, Милан Шипка, *Велики речник ст̄раних речи и израза*, Нови Сад, Прометеј, 2006, 782.

[5] Милан Вујаклија, *Лексикон ст̄раних речи и израза*, Belgrade, Prosveta, 1986, 576.

[6] Mirjana Veselinović-Hofman, *Fragmenti o muzičkoj postmoderni*, Novi Sad, Matica Srpska, 1997, 25.

[7] Ibid., 21.

[8] Ibid., 22.

[9] Ibid., 25.

[10] Ibid., 27.

Within the models-modelling system, the term modelling in the process of working on musical literacy is used in its universal sense—shaping, forming, building. To more fully define this fundamental system of knowledge acquisition in the context of music pedagogy, and to clarify the strict usage of the term "model", it is necessary to note the terminological distinction that appears between the terms "model" and "basis". The meanings of both terms can be taken as synonymous with: an example of someone or something, a norm for something, prototype, paradigm, etc. The basis can fundamentally be mutable, while the melodic model is strict, methodologically grounded and may only be used literally. The sole exception which is unavoidable and methodologically grounded is the transposition of the model into identical tonalities.

Musical models are melodies, either patterned off of songs or methodically purpose-made melodies with lyrics, which are memorised. They have, as a rule, a simple melodic, rhythmic and harmonic texture, as well as a formal structure.

The melodic model must be sung many times, first with lyrics, then with solmization of tones, with the purpose of embedding it deep in long-term or permanent memory. Based on the memorised melodic models, sound impressions and deposits are created, as a firm basis upon which the skills and abilities of translating notation into sound (singing and playing instruments), as well as the skills and abilities of translating sound into notation (writing down music) can be built up.

The initial, characteristic parts of melodic models have an identical, if not more important, purpose to the entirety of the model, particularly in the second stage of work when, in the process of modelling, the phenomenon of association with an already memorised melodic model plays a role. That is to say, the stage where the skill of associating sound impressions with the way the initial part of the model evokes in the mind the placement and functionality of the tone in the scale or tonality is gained. According to Ivana Drobni, "we must first establish foundations for sound, relying on them to isolate tones based on associations with [...] models, which creates cohesion between tonal functions and tonal logic. Afterwards, we actualise tonal names by isolating the initialis and associating it with its position in the stave".[11]

[11] Ивана Дробни, "Тонално – апсолутно, или у потрази за методичким консензусом", *Настава и васпитање*, 57/1, 2008, 40.

Model songs for establishing tone pitches, among others, comprise the *functional method on folk bases* of Miodrag A. Vasiljević (1903–1963)[12] and the *combined functional method* established and codified by Zorislava M. Vasiljević (1932–2009).[13] The term "functional" in both methods stems from the reliance on the placement and action of tones and their auditive meaning and role within the tonality of the major-minor tonal system. In Miodrag Vasiljević's case, the starting point for the initial phase of the development of musical literacy are folk songs, and instructional, i.e. melodic examples are primarily based on national musical patterns, followed by the basics of the Western European major-minor system.[14] The first steps towards achieving impressions of tonal sounds require the selection of adequate melodic models, or "model-songs". Zorislava Vasiljević worked to define and methodologically interpret this principle within the framework of the Functional Method, and the choice of musical material was expanded from folk songs to other musical genres (children's songs, popular music, composed melodic models with a clear methodological purpose, etc.). In the context of the aforementioned, Aleksandra Jović-Miletić notes:

> One of the more significant benefits of the system is moving beyond intervals as a listening and intonation technique. As the inventor of the system, Vasiljević uses models to establish individual tonal pitches and enables seamless shifts, as there is no internal cohesion between tones that would interfere with a skip between the inner tones of a melody, or in a scale, because the tones are made independent. Thanks to the free functioning of different sound reference points, cognitive processes for organising sound materials into higher order structures are enabled. The key foundation of tonal pitches is not a solmization syllable, but rather a process of creating connections with sounds via association and memory, where the initial tone of a song jogs the memory of a specific tonal pitch...[15]

[12] Serbian folk songs – musical models or "model songs", as they are termed in music pedagogy and the methodology of music literacy, are "the most famous innovation of music pedagogue and ethnomosicologist Miodrag A. Vasiljević". Cf. Александра Јовић Милетић, *Почетно музичко описмењавање на српском музичком* језику, Београд, 2011, 18.

[13] Over time, in the course of teaching practice, these were modernised and built upon, foremost through the work of music pedagogue Zorislava M. Vasiljević (1932–2009). They are used and are applicable in their original meaning in modern teaching practice in the initial stages of music education in the teaching of Solfeggio. Cf. Александра Јовић Милетић, op. cit.

[14] Ibid., 19.

[15] Ibid., 18.

The function and importance of controlling the musical model can be interpreted as "part of the process of developing thinking according to certain rules".[16] Establishing tonal pitches is performed by modelling the melodic model with the goal of permanently implanting sound in the consciousness by creating clear sound impressions. Modelling, as a building block of the system, assumes the use of the phenomenon of association with melodic models, which leads to the phase of developing automatisms, the reflexive detection of tonal pitches in the natural scale or tonality, and later those elements of music that they are intended for. The initiator of the whole process is the recall of a known melodic model.

The phenomenon of "associations" as a process of creating mental relationships or memories on the basis of similarities, as an inevitable part of the process, contributes to the creation of sound deposits. The associative process represents a sort of transition from the acquisition of a musical deposit to a fundamental comprehension of the terms, phenomena and rules of music, as well as the ability not only to correctly perform music, but also to create one's own interpretation of a musical piece.

Association, generally, refers to intrinsic or developed connections which condition the action of certain psychological processes.[17] Within the *models-modelling* system, this refers to the acquired ability to recognise and make use of previously learned sound, or rather previously acquired sound impressions, or learned melodic models. Zorislava Vasiljević notes that "it is necessary that the process of association of a larger number of musical elements be taken to and embedded in the process of developing automatisms, without analytical examination and study of musical content and its details".[18] By creating sound deposits and impressions, a process of driving associations and creating connections between sound impressions and the notational image is initiated, and "through the reinforcement of certain associations, responses and behaviour in new circumstances will be quicker, more confident and finally, automatic".[19]

Within the process of modelling, the final phase is the acquisition of a reflexive response—recalling the sound of the model or its initialis with the

[16] Ивана Дробни, "Тонално-апсолутно...", op. cit., 37.

[17] Mladen Vilotijević, *Didaktičke teorije i teorija učenja*, Beogad, Naučna Knjiga, Učiteljski fakultet, 1999, 103.

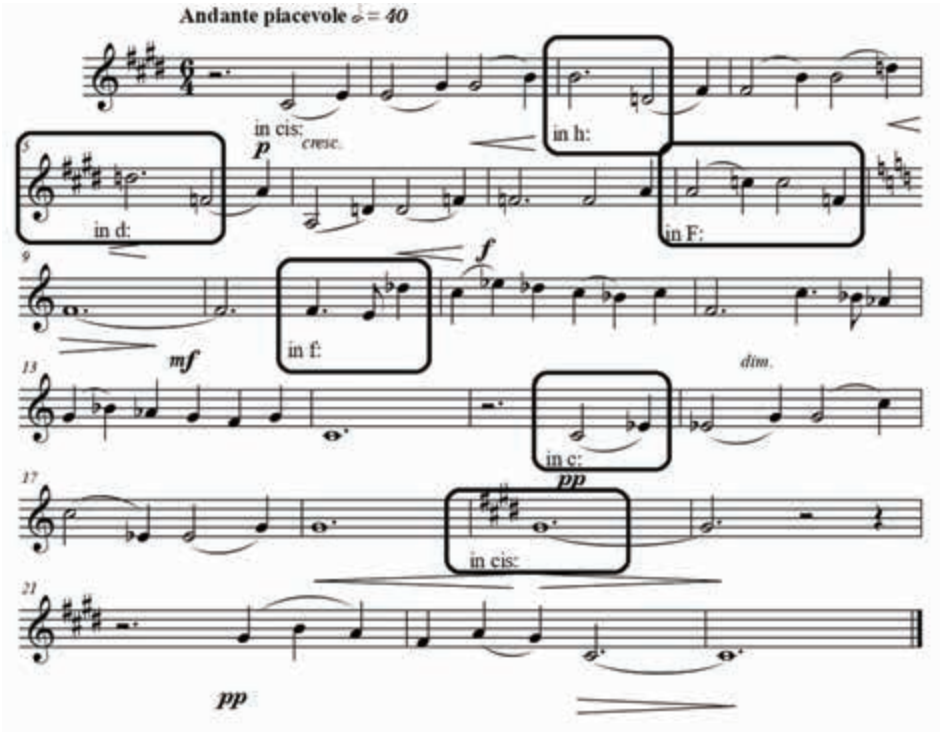
[18] Zorislava Vasiljević, *Metodika solfeđa*, Beograd, Fakultet muzičke umetnosti, 1991, 26.

[19] Ивана Дробни, "Тонално-апсолутно...", op. cit., 39.

inner ear. Automatism ensures the speed of sound detection, especially tonal pitches and durations, but also including reactions to other musical parameters: tempo, character, dynamics, articulation, etc.

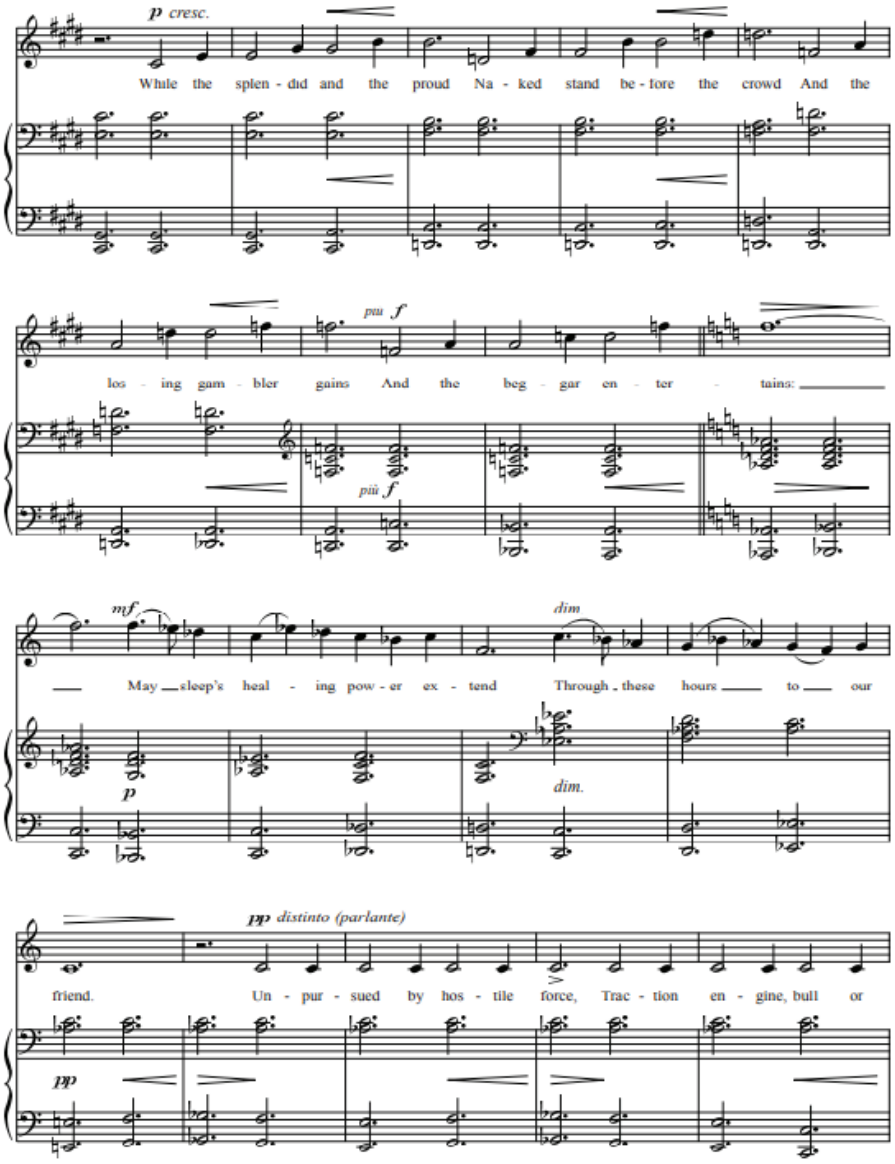
Generally speaking, the goal of working with musical models and the application of their modelling is establishing relative relationships between tones within the tonalities of the major-minor system. That is to say, it concerns tonal melodics.

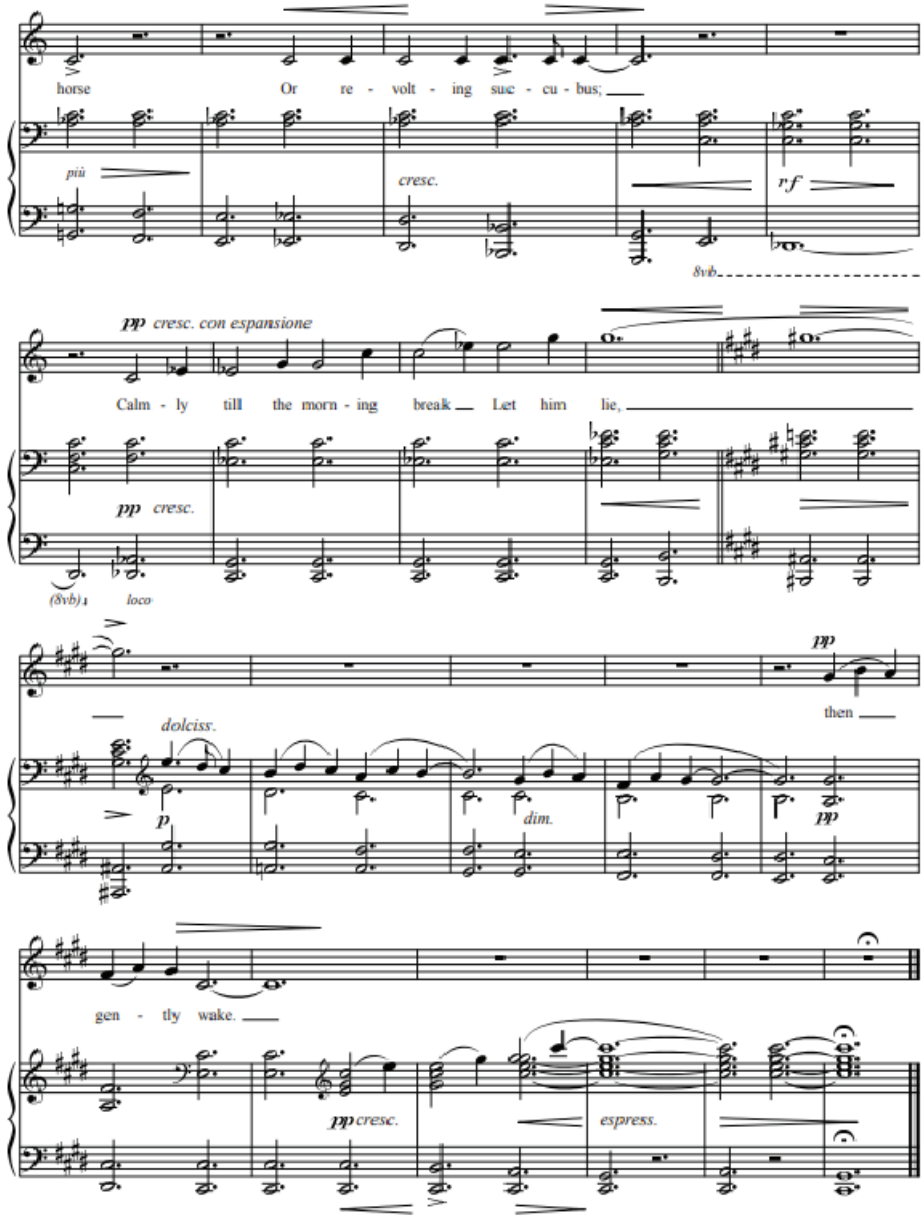
Example 1: Instructional melodic example based on Benjamin Britten's *Nocturne*, from the collection *On this Island* for vocals and piano, op. 11



The above monophonic example is derived from a Benjamin Britten piece, intended to be sung, with the solmization naming of tones in Solfeggio class. The tonalities written below the stave are not codes for harmonic progression (harmonic analysis of a stave) but rather indicators for how to think about a line, which entails modelled relationships between tonalities which are mainly heard with the inner ear.

Example 2: Benjamin Britten, *Nocturne*, from the collection *On this Island* op. 11, with lyrics by W. H. Auden (1937) *Andante Piacevole*, bars 20 to 75



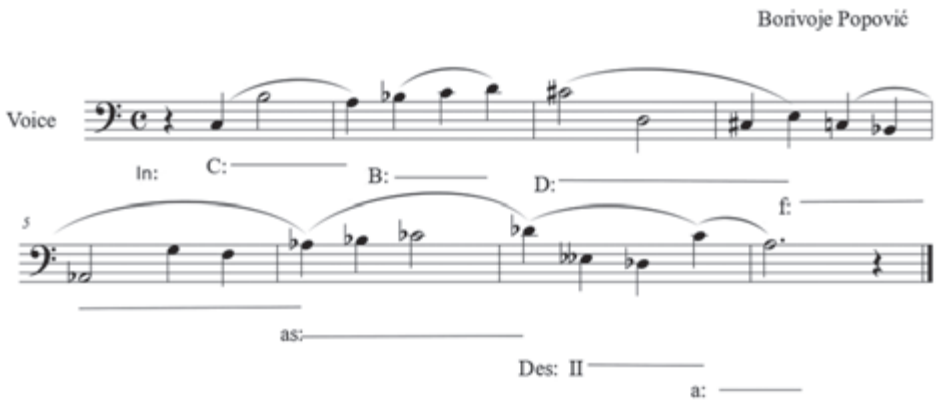

horse
Or re - volt - ing suc - cu - bus;
più
cresc.
rf
8vb
pp cresc. con espansione
Calm - ly till the morn - ing break Let him lie,
pp cresc.
(8vb)
loco
pp
then
dolciss.
p
dim.
pp
gen - tly wake.
pp cresc.
espress.

The way of musical thinking demonstrated here, which entails modulating into temporary (imaginary) tonal centres, is effective when singing the vocal line by naming tones, in situations where there is no "affirmation of a specific tonality",[20] i.e. cadence, between melodic phrases. In these situations, the perception and reception of musical progression are enabled by imagined micro-tonalities which are detected by one's inner ear and by the modelled tonal relationships within them, whose vocal performance has been taken to the level of a reflexive or automatic reaction.

The process of linear reading and learning of a score ensures intonational accuracy, accurate and fluent performance of the melodic and rhythmic components, as well as the perception of all other musical parameters recorded in the score. The process of learning is complemented by accompaniment with a harmonic instrument (in the case of the solo Benjamin Britten song, the piano) which allows one to gain a clear impression of the harmonic language of a piece.

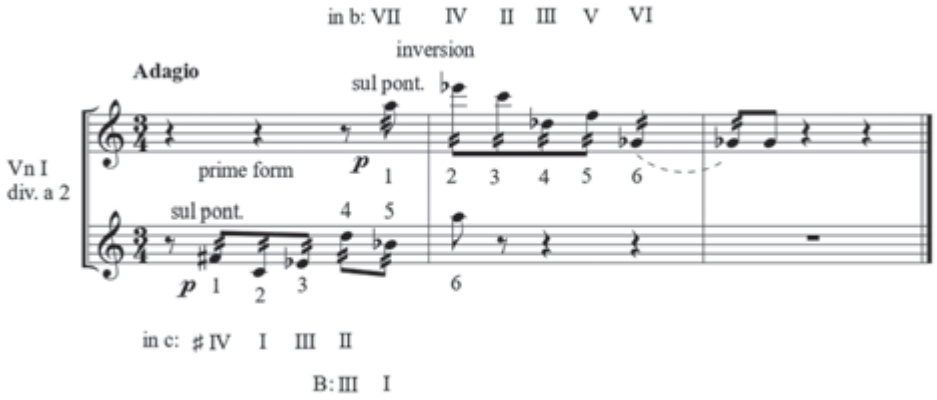
This method of reading and singing from a sheet by naming tones with solmization syllables is also functional when performing lines where the absence of a tonic centre and tonality is evident (Example 3) as well as in the realm of atonal music (Example 4).

Example 3: Borivoje Popović, instructional melodic example[21]



[20] Дејан Деспић, *Хармонска анализа*, Београд, Универзитет уметности, 1970, 175.
[21] Borivoje Popović, *Intonacija*, Beograd, Univerzitet umetnosti, 1992, 60.

Example 4: Fragment from Petar Ozgijan's *Sigogis* for orchestra (1967). Counterpoint structure of melodic line/melodic-horizontal polyphony—six-tone model in the fundamental form and inversion



In conclusion, in the process of working on forming a functionally musically literate individual, the expression and concept of a model is terminologically, structurally and functionally clearly defined, and in conjunction with the process of developing associations and automatisms forms a specific and unique musical-pedagogical system "with respect to its significant structural components and their elements, character and the nature of connections and relationships that exist between them, and the dynamism and functioning of the system both as a whole and of each of its individual components".[22] Within the framework of learning other music disciplines, in particular harmony and counterpoint, the *models-modelling* system, with some necessary adaptations and transformations, can be quite functional, especially if structured in correlation with the music disciplines of solfeggio, harmony, music forms/analysis of musical works, and music styles.

[22] Radovan Antonijević, *Уīемељење сисīема знања у īедаīоīији*, op. cit., 73.

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Summary

In the process of reading a score, translating a notational image into sound (singing), understanding music content and meaning in music, solfeggio encompasses all known forms of reading a musical text, understanding music content, performing music as well as writing down an understood and memorised musical sequence. For the purposes of all-encompassing understanding, that is to say a fundamental comprehension of terms, phenomena, rules and meaning of music, a high degree of importance is placed on the implementation of a methodologically formulated system which efficiently lays the groundwork for understanding musical art and the knowledge thereof, and the performance and interpretation of a musical work. A constructive system in the field of gaining musical knowledge is a unique, methodologically grounded process composed of a musical model and the process of working with that model—modelling. The process is made up of models and two sub-components of modelling: the development of associative abilities and the acquisition of an automatic response to sound. Based on memorised melodic models, sound impressions and

deposits are formed, as a basis on which the abilities and skills of translating a notational image can be developed, entailing translating a sheet into sound (singing and playing instruments) and translating sound into a notational image (writing down music). In the process of working on modelling, the final phase is the acquisition of a reflexive response—recalling the sound of a model or its initialis with the inner ear. The essence of working with musical models and applying their modelling is establishing relative relationships between tones within the tonalities of the major-minor system. However, that work is constructed as a mode of thinking that is applicable in all music styles and tonal relationships (tonal and atonal).

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A NEW CONCEPT OF TEACHING AND LEARNING ABBA'S SONGS IN THE UNIVERSITY SOLFEGGIO CLASSROOM**

Abstract: A new interdisciplinary approach of teaching ABBA's songs in university solfeggio classes involves: *graphical representation* of melodic contours and harmonic progressions; *embodied tension and relaxation* caused by the (un)expected harmonic patterns/progressions, form and rhythm; *aural and visual music analysis* of ostinato and drone, as the elemental characteristics of popular music, and Dorian mode, pentatonic and blue tones, as the main Orff-Schulwerk teaching strategies; *emotions*, experienced in relation to the gradual addition of voices and the chain of dominants; *verbality*, respecting the use of rhymes in verse translations, and the prosodic stress, musical meter and melodic contour alignment.

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Keywords: popular music, popular music pedagogy, ABBA, informal learning practices, formal university solfeggio classes, multimodality, interdisciplinary approach

Introduction

After giving a review of literature on popular music, its use in formal music education, and the use of ABBA's songs in the music curriculum, I continue with the possibility of using informal popular music learning practices in the formal university solfeggio classroom through the use of ABBA's songs. I assume that popular music which students like to listen to should sometimes replace instructive solfeggio exercises, because it will move the focus from reproduction to an integration of listening, performing, improvising and composing.

Aware of the fact that for the involvement of popular music in this goal, alternative methods of music education and teaching and learning strategies needed to be developed, I proposed a new concept of multimodal experience and analysis of ABBA's songs, which includes an interdisciplinary musicological and pedagogical approach. This concept is divided into the following six categories: *graphical representation* of melodic contours and harmonic progressions; *analysis of tension and relaxation*, in relation to (un)expected harmonic patterns, progressions and rhythm; *music analysis* of the elemental features of popular music (ostinato and drone) and Orff-Schulwerk teaching strategies for modes, pentatonic and blue tones, that are typical elements of popular music; *emotion analysis,* which involves increasing the emotional reaction by the gradual addition of voices; *linguistic analysis,* which implies the use of rhymes and the alignment of linguistic stress, musical meter and melodic contour.

The first section explains the possibility of *graphical representation* of the melodic contour and harmonic progressions of ABBA's songs. On the one hand, the melodic contour is projected on the harmonic plan of the song, due to the functionality of the melody itself. On the other hand, the word "contour" is taken from other areas of human experiences, aiming to explain the abstractness of melodic movement and its inevitable metaphorical interpretation. In psychological terms, the arch-shaped melodic contour, frequently found in ABBA's songs, most likely satisfies the listener's expectations, as it is perceived as a scheme of cyclic climaxes, changes of tension and relaxation, and a state of melodic balance, because the alternation of upward and down-

ward movement in approximately equal chunks balances the melody. An arch-shaped contour is experienced in the context of positive feelings, probably because pleasure is derived first from the tension and then from the relief.[1]

In the second section, *expectations in music* influenced by the harmony and rhythm in ABBA's songs are described. Unexpected harmonic patterns and progressions in preferred popular music are perceived as more enjoyable than in music with more conventional harmonic structures.[2] In ABBA's songs, tension is achieved by frequent polyrhythms, because of the conflict that is created between parallel rhythmic timing and bimanual coordination.[3]

The next two sections deal with the *musical analysis* of ABBA's songs. The third one discusses the elemental characteristics of ABBA's songs – the use of ostinato and drone. These simple repetitive techniques also appear in the music of primal cultures and children's musical expressions. Orff believed that ostinato and drone correspond to the child's development and therefore used them both in the folk and world repertoire in a typical Orff-Schulwerk curriculum. The fourth section then describes the important Orff-Schulwerk teaching strategies mostly based on modal, pentatonic and blues scales that could be applied to ABBA's songs.[4]

The fifth section emphasizes the role of ABBA's songs in evoking emotions in listeners, especially through the harmonic component and lyrics, but also the sudden switch from thick to thin texture[5] and back, through the gradual addition of voices for pedagogical purposes.[6]

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[1] David Huron, *Sweet Anticipation: Music and the Psychology of Expectation*, Cambridge, MA, MIT Press, 2006.

[2] S. Miles, D. Rosen, N. Grzywacz, "A statistical analysis of the relationship between harmonic surprise and preference in popular music", *Frontiers in Human Neuroscience*, 11, 2017, 263.

[3] R. T. Krampe, R. Kliegl, U. Mayr, R. Engbert, "The fast and the slow of skilled bimanual rhythm production: Parallel versus integrated timing", *Journal of Experimental Psychology Human Perception & Performance*, 26(1), 2000, 206–233.

[4] Brett Clement, "Diatonic and Chromatic Tonicization in Rock Music", *Journal of Music Theory*, 63(1), 2019, 1.

[5] Jaak Panksepp, "The emotional sources of 'chills' induced by music", *Music Perception*, 13, 1995, 171; Meghan Goodchild, *Orchestral Gestures: Music-Theoretical Perspectives and Emotional Responses*, a thesis submitted to McGill University in partial fulfillment of the requirements of the degree of Doctor of Philosophy in Music Theory, Montreal, Schulich School of Music, McGill University, 2016.

[6] Милена Петровић, *Хармонска пратња – приручник за наставнике у првом раз-*

The last, sixth section highlights the importance of the linguistic analysis of ABBA's songs. The pedagogical approach implies first understanding the verses, and then their free translation into Serbian, with the use of rhymes in cadenzas that help verse and melody memorization. Moreover, songs that have linguistic stress, musical meter and melodic contour alignment are easier to memorize.[7]

The use of popular music in formal music education – literature review

Popular music is defined as a mass-consumed music.[8] It has become a major topic of research of so called urban musicology.[9] Popular music is familiar to students nowadays as it is closely related to their everyday experiences and musical preferences.[10] While some scholars argue that popular music is of a quality good enough to be part of children's music education, others eagerly introduce popular music in formal music education classrooms and today call it "music for children".[11] They realize that popular music is educationally valuable[12] as it helps students connect what they already know to new concepts. It is well observed that playing or singing popular music in a formal educational setting arouses the interest of students of different ages.[13]

Popular music is used in the entire course of education, from primary school to postgraduate studies in the form of different programs, courses and

реду средње музичке школе – одсек за музичку ѳеорију, Београд, Чаробна фрула, 2021, 145–146.

[7] H. Gingold, E. Abravanel, "Music as a mnemonic: The effects of good- and bad-music settings on verbatim recall of short passages by young children", *Psychomusicology: A Journal of Research in Music Cognition*, 7(1), 1987, 25; C. Palmer, M. H. Kelly, "Linguistic Prosody and Music Meter in Song", *Journal of Memory and Language*, 31, 1992, 525.

[8] Lucy Green, "Popular music education in and for itself, and for 'other' music: current research in the classroom", *International Journal of Music Education*, https://doi.org/10.1177/0255761406065471, 2006.

[9] Tim Carter, "The sound of silence: models for an urban musicology", *Urban History*, 29(1), 2002, 8.

[10] Jennifer Doyle, "Music teacher perceptions of issues and problems in urban elementary students", *Bulletin of the Council for Research in Music Education*, 194, 2012, 31.

[11] Martina Vasil, "The Role of Popular Music in the Schulwerk", *The Orff Echo*, 52(4), 2020, 24.

[12] Lucy Green, *Music, informal learning and the school: a new classroom pedagogy*, Vermont, Ashgate, 2008.

[13] S. Oehler, J. Hanley, "Perspectives of popular music pedagogy in practice: An introduction", *Journal of Popular Music Studies*, 21(1), 2009, 2.

classes. Combining formal and informal ways of learning presents a good practice within popular music education[14] and informal learning can be effectively applied in schools.[15]

Popular music education is an interdisciplinary field that includes music education, ethnomusicology, community music, cultural studies and popular music studies.[16] Music organizations, journals and individual researchers have recognized the significance of popular music education. A Special Interest Group in Popular Music Education exists within the International Society for Music Education, and the Association for Popular Music Education and the *Journal of Popular Music Education* have been founded recently. Scholars and pedagogues realize that popular music is crucial for students nowadays and therefore must be included in music education.

The need for introducing popular music in school curricula has been a topic of substantial research over the past few decades. However, popular music should not be introduced in teaching only as a new repertoire and to satisfy students' tastes.[17] Rather, informal learning processes, typical of the ways that popular music is learned, must be applied as well.[18] It could happen that students will not accept a formal educational approach to popular music analysis.[19] Informal music learning is a holistic way of learning and offers an interdisciplinary approach, and as such it can also be used to teach classical music.[20] Integrating popular music into higher education can enrich the university classroom.[21]

There are several questions regarding the introduction of popular music in pedagogy. The first question of what is considered popular music still remains. It is suggested that consumption, delivery and audience are the three

[14] Michael Ahlers, "Opening minds – style copies as didactical initiators", *IASPM Journal*, 5(2), 2015, 181–194.

[15] Lucy Green, *How popular musicians learn: A way ahead for music education*, Vermont, Ashgate, 2001.

[16] G. D. Smith, B. Powell, "Technology and performance in popular music education" [special issue], *Journal of Music, Technology and Education*, 8 (2), 2015.

[17] Lucy Green, *Music on deaf ears: Musical meaning, ideology and education*, Manchester, Manchester University Press, 1988.

[18] Lucy Green, op. cit., 2008.

[19] Lucy Green, op. cit., 2006, 107.

[20] Lucy Green, ibid.

[21] L. Przybylski, N. Niknafs, "Teaching and learning popular music in higher education through interdisciplinary collaboration: Practice what you preach", *IASPM Journal*, 5(2), 2015, 100.

fundamental principles that determine whether a piece of music is popular or not.[22] It is interesting that the Beatles are already recognized as classical music by some pupils[23] probably because music that is used in the classroom is considered by students as classical music.[24]

The second question concerns the fact that popular music must follow national curriculum requirements.[25] After World War II, popular music and jazz were associated with students' rebellion, sexuality and drugs, and so it was unthinkable to introduce that kind of music into the official curriculum.[26] It was not until the end of the 20th century that popular music began to be formally introduced into teaching within academic institutions around Europe, the US and Australia. In the last decade, the importance of introducing playing and studying popular music within the existing subjects in primary and secondary music schools in Serbia has become increasingly important. At the Faculty of Music in Belgrade, there are 21 courses that include the study and performance of popular music, and most of them are elective.

The third and most complex question refers to analytical methods that should be applied in the analysis of popular music. One of the main problems in studying popular music is how to find appropriate methods,[27] as popular music does not respond to the system of analysis based on functional tonality.[28] Some scholars believe that semiotics offers a good analytical and interpretive method that is reflected in the relationship between a musical event and its significance.[29] Contemporary musicologists have been developing new analytic criteria that are more suited to the inherent meanings of popular

[22] Carlos Xavier Rodriguez, "Bringing It All Back Home: The Case for Popular Music in the Schools", in: C. X. Rodriguez (Ed.), *Bridging the Gap: Popular Music and Music Education*, Reston, Virginia, MENC, 2004, 3.

[23] Lucy Green, op. cit., 2006, 107.

[24] Paula Laurel Jackson, *Secondary school pupils' conceptions of music in and out of school: Conforming or conflicting meanings?* Unpublished PhD thesis, London, Institute of Education, University of London, 2005.

[25] Lucy Green, "From the Western classics to the world: secondary music teachers' changing perceptions of musical styles, 1982 and 1998", *British Journal of Music Education*, 19(1), 2002, 5.

[26] Lucy Green, op. cit., 2006, 106.

[27] Peter Dunbar-Hall, "Analysis and Popular Music: a Challenge for Music Education", *Research Studies in Music Education*, 13(1), 1999.

[28] Richard Middleton, *Studying Popular Music*, UK, Open University Press, 1990.

[29] Peter Dunbar-Hall, "Semiotics as a Method for the Study of Popular Music", *International Review of the Aesthetics and Sociology of Music*, 22(2), 1991, 131.

music, as they arise from the ways in which this music is produced and transmitted.[30] Some analytical methods have emerged from the notion of movement, which is very present and so important in popular music, but rarely represented in musicological research. Well-guided body movement can facilitate the perception and inference of musical structure.[31]

As this paper refers to the use of ABBA's songs in music pedagogy, I further list some studies related to this topic. Music teachers, who are curriculum designers, believe that ABBA's songs are appropriate for Grade 6 students. The Model Music Curriculum: Key stages 1 to 3 in the UK is designed to introduce students to a broad repertoire of music from the Western Classical tradition to the best popular music and music from around the world, that can be found on Classical 100, BBC Ten Pieces and at the English Folk Dance and Song Society.[32] The 20th Century repertoire contains ABBA's song "Waterloo" from 1974, meant to be listened to and learned in Grade 6. Results of the recent study[33] show that Grade 6 students prefer ABBA and contemporary popular music to other styles of music. Choir members indicated that they like being in a choir and love to sing, but state that choir singing is different to the way they really like to sing, "even when it's cool music like ABBA … We don't get to sing it like ABBA".[34]

Some researchers underline the interdisciplinary connection between art and education.[35] They use ABBA's music in the classroom to improve students' educational practices and development. The aim is to integrate an aesthetic educational experience with the constructed knowledge and the body of theoretical knowledge available about ABBA.[36] A study that investigated teachers' perceptions of creativity in music education showed that one teacher's pre-school music experiences were rich and diverse, ranging from classi-

[30] Richard Middleton, "Popular music analysis and musicology: bridging the gap", *Popular Music*, 12(2), 1993, 177.
[31] Ibid., 178.
[32] Non-statutory guidance for the national curriculum in England, Model Music Curriculum: Key Stages 1 to 3, 2021, 61.
[33] Peter De Vries, "What we want: the music preferences of upper primary school students and the ways they engage with music", *Australian Journal of Music Education*, 1, 2010, 3.
[34] Ibid., 10.
[35] J. P. H. Pretorius, D. S. Du Toit, C. Martin, G. Daries, "ABBA: An Educational Appreciation", *Journal of Aesthetic Education*, 47(1), 2013, 72.
[36] Ibid., 90.

cal music recordings, folk music to ABBA.[37] In a study about the musical worlds of mothers and their children, one narrative explained the strong connection between mother and child that was created while listening to ABBA's music.[38] Moreover, some scholars used ABBA's music to teach economics concepts.[39]

Through ABBA's songs, university students easily notice and quickly understand the positive effects of combining informal and formal music learning practices. They have great motivation because they learn the music they like to listen to. They start the analysis not by watching the music scores, but by structural listening, creating a graphic representation of musical structures. In this way, we remind students of the importance and meaning of sound. Further, students search for harmonic rhythm by playing recordings by ear, in the context of metric structure and melodic connotation. What is very important is the fact that students learn in a group, in which they feel relaxed and motivated. Learning does not involve a separation of activities, but on the contrary, the integration of listening, singing and playing. Finally, students make their own verse translations into Serbian and vocal and instrumental arrangements, so they are taught to rely on improvisation.[40]

A new interdisciplinary musicological and pedagogical approach to listening, analyzing, performing and notating popular music through ABBA's songs is presented below.

Graphic representation of melodic contour and harmonic progression

The melodic contour is best presented graphically,[41] because conceptual metaphors that use geometric space and phenomena, such as "line", "arch" or

[37] Oscar Odena Caballol, *Creativity in music education with particular reference to the perceptions of teachers in English secondary schools*, Thesis Submitted for the Degree of Doctor of Philosophy, London, University of London, Institute of Education, 2003, 232.

[38] Elizabeth Mackinlay, "Singing maternity: Making visible the musical worlds of mothers and their children", in: L. Suthers (Ed.), *Proceedings of ECME [Early Childhood Music Education] Commission 13th International Seminar of ISME [International Society for Music Education] Music in the early years: Research, Theory and Practice*, Rome, Centro Giovanni XIII, Frascati, 2008, 49.

[39] R. Lawson, J. Hall, G. D. Mateer, "From ABBA to Zeppelin, Led: Using Music to Teach Economics", *The Journal of Economic Education*, 39(1), 2008.

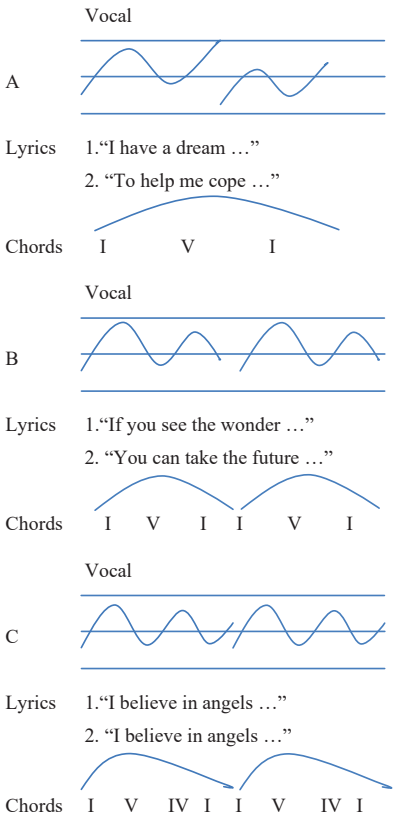
[40] Lucy Green, op. cit., 2008.

[41] Mantle Hood, *The ethnomusicologist,* New York, McGraw-Hill, 1971, 302.

"pendulum", are frequently used for the phenomenological description of music contour.[42]

The melodic contour helps in the analysis of musical structure, because the analysis of melodic contours is conditioned by global tonal relationships in melodies.[43] The tonal scheme of the melody has a decisive role in listeners' cognition. Therefore, the melodic contour of the vocal part and harmonic progression in the A, B and C part of the song is graphically represented (Example 1).[44] By using such notation, students learn a number of underlying principles of popular music – reliance on improvisation and music as sound

Example 1: Graphical representation of ABBA's song "I Have a Dream"



[42] Bruno Nettl, *Theory and Method in Ethnomusicology*, New York, Macmillan Publishers, 1964, 147–148.

[43] J. Bartlett, J. Dowling, "Scale Structure and Similarity of Melodies", *Music Perception*, 5(3), 1988, 285.

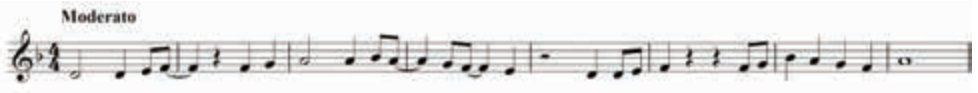
[44] Richard Middleton, op. cit., 1993, 184.

rather than music as notation.[45] They also learn that the melodic contour of the vocal part in popular songs is mostly arch-shaped.

Arch-shaped contour is used by mothers when they want to maintain a child's attention[46] and to express praise (for example, bravo!) or to extol children's virtues.[47] Some authors even believe that musical elements of mother-child communication generates the music that man, at a later age, uses and creates, i.e. the mother-child communication is an emotional prototype from which music later develops.[48]

The old melodic (counterpoint) convention states that whenever something goes in one direction, it needs to be compensated by movement to another direction ("gap-fill melody").[49] Arch-shaped melodic contour is common for children's songs, but it also presents the most common contour in songs around the world. Out of a total of 383 analyzed songs, 295 have the arch-shaped melodic contour.[50] This kind of contour is typical of the ballad genre and indeed represented in most of ABBA's songs (Example 2).

Example 2: Arch-shaped melodic contour in the song "Slipping through My Fingers"



The majority of students experience the arch-shaped contour as evoking positive feelings and happiness.[51] This corresponds to the claim from the genera-

[45] Peter Dunbar-Hall, Kathryn Wemyss, "The effects of the study of popular music on music education", *International journal of music education*, 36(1), 2000, 25.

[46] D. Stern, S. Spieker, K. MacKain, "Intonation contours as signals in maternal speech to prelinguistic infants", *Developmental Psychology*, 18, 1982, 727.

[47] Anne Fernald, "Intonation and communicative intent in mothers' speech to infants: Is the melody the message?", *Child Development*, 60, 1989, 1497.

[48] Ellen Dissanayake, "Antecedents of the Temporal Arts in Early Mother Infant Interaction", in: N. Wallin, S. Brown, B. Merker (Eds), *The Origins of Music*, Cambridge MA, The MIT Press, 2000, 389.

[49] Burton S. Rosner, Leonard B. Meyer, "Melodic Processes and the Perception of Music", in: Diana Deutsch (Ed.), *The Psychology of Music*, New York, Academic Press, 1982, 323.

[50] Alan Lomax, *Folk song style and culture*, Washington, American Association for the Advancement of Science, 1968, 328.

[51] Милена Петровић, „Мултимодалне перспективе музичке педагогије – мелодијска контура као емотивна граматика у музици и језику", *Наслеђе*, 41, 2018, 291.

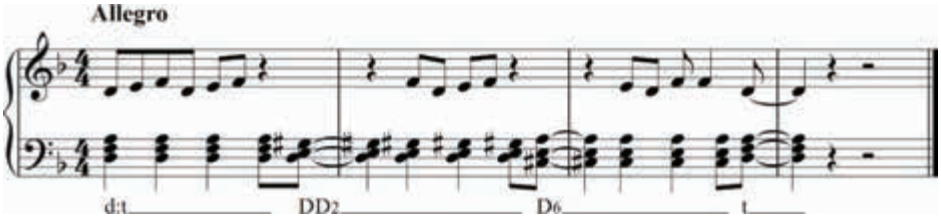
tive theory of tonal music, where the prolongational tree is a binary tree that expresses the structure of tension and relaxation in a piece of music.[52] It also correlates with the theory that pleasure can be derived from the build-up of tension (surprise) followed by its relief (non-surprise).[53]

Harmonic and rhythmic influences on musical expectancy

Popular music is recognizable by its unpredictable and unexpected harmonic progressions. Recent research results show that popular music with more surprising chords tends to be perceived as more enjoyable than music with more conventional harmonic structures.[54] This is based on the discovery that dopamine is often activated when something new is experienced[55] and when listening to unexpected harmony.[56] Moreover, increased harmonic surprise was more pronounced in preferred songs.[57]

In the song "Money, Money, Money", students will recognize the classical harmonic pattern – the secondary dominant chord resolves to the dominant chord (Example 3).

Example 3: The expected classical harmonic pattern secondary dominant – dominant in ABBA's song "Money, Money, Money"



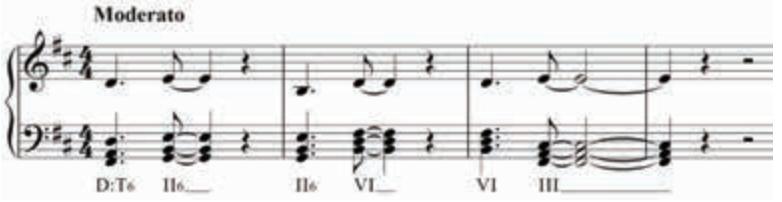
[52] Fred Lerdahl, Ray S. Jackendoff, *A Generative Theory of Tonal Music*, MIT Press, 1983.
[53] David Huron, op. cit.
[54] S. Miles, D. Rosen, N. Grzywacz, op. cit.
[55] T. Suhara, H. Fukuda, O. Inoue, T. Itoh, K. Suzuki, T. Yamasaki, Y. Tateno, "Age-related changes in human D1 dopamine receptors measured by positron emission tomography", *Psychopharmacology*, 103, 1991, 41.
[56] V. N. Salimpoor, M. Benovoy, K. Larcher, A. Dagher, R. J. Zatorre, "Anatomically distinct dopamine release during anticipation and experience of peak emotion to music", *Nature Neuroscience*, 14, 2011, 257.
[57] S. A. Miles, D. Rosen, S. Barry, D. Grunberg, "What to Expect When the Unexpected Becomes Expected: Harmonic Surprise and Preference Over Time in Popular Music", *Frontiers in Human Neuroscience*, 15, 2021, 1.

However, students will be surprised to hear that in some of ABBA's songs the secondary subdominant resolves into the subdominant (Example 4). This harmonic pattern is atypical of classical harmony and students will find it only in popular music.

Example 4: The unexpected harmonic pattern secondary dominant – subdominant in ABBA's song "Dancing Queen"

Likewise, students will realize that popular music sometimes introduces very traditional harmonic progressions. For example, the song "I Have a Dream" has only three main chords – tonic, dominant and subdominant. However, most often tonal centers in popular music do not produce the same tension and relaxation as is produced in tonal art music.[58] Students encounter songs that contain unusual and unexpected harmonic progressions (Example 5).

Example 5: The unexpected harmonic progression in ABBA's song "Knowing Me, Knowing You"



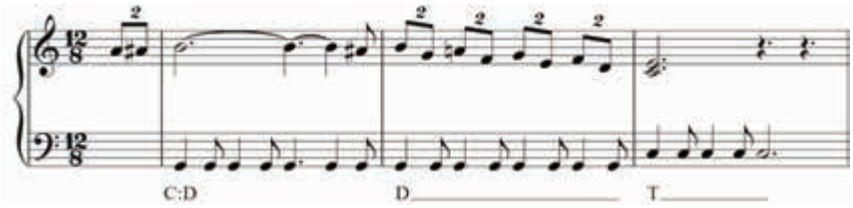
Surprising effects in popular music are achieved in terms of form and rhythm. In the song "Mamma Mia", an interesting surprise effect is achieved in the chorus, which is, unexpectedly, the quietest part of the whole song. The tension created by polyrhythm is one of the strongest rhythmic means of communication in popular music. Polyrhythm is a strong attractor of attention, as it evokes many difficulties regarding the cognition of music and movement control.[59] Students either integrate an independent timing variation of

[58] Peter Dunbar-Hall, Kathryn Wemyss, op. cit., 30.

[59] R. T. Krampe, R. Kliegl, U. Mayr, R. Engbert, "The fast and the slow of skilled bimanual

both hands,[60] a common time frame for the hands,[61] or an integrated timing control, permitting partial hand independence in polyrhythmic performance.[62] Hand or voice independence presents the adaptivity of human movement control that emerges at high levels of skill (Example 6).

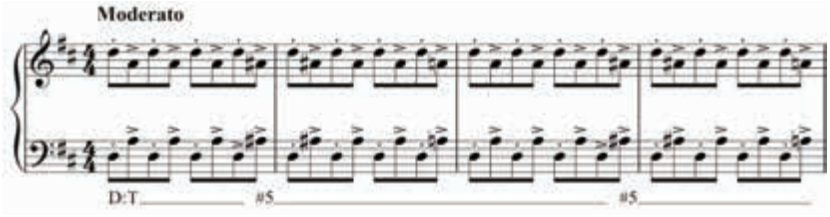
Example 6: Polyrhythm in ABBA's song "I do, I do, I do, I do, I do"



Elemental features of ABBA's songs: ostinato and drone

The elemental characteristics of popular music are repetitive melodic and rhythmic patterns and simple forms, for which listeners do not need technical or theoretical musical knowledge. ABBA's songs often contain repetitive ostinato and drone patterns. For example, in the song "Mamma Mia", the initial tension is achieved by the ostinato and oscillation back and forth between root and fifth, and root and sharpened fifth, and by the accents on the offbeat (Example 7).

Example 7: Ostinato in ABBA's song "Mamma Mia"



rhythm production: Parallel versus integrated timing", *Journal of Experimental Psychology, Human Perception & Performance*, 26(1), 2000, 206.

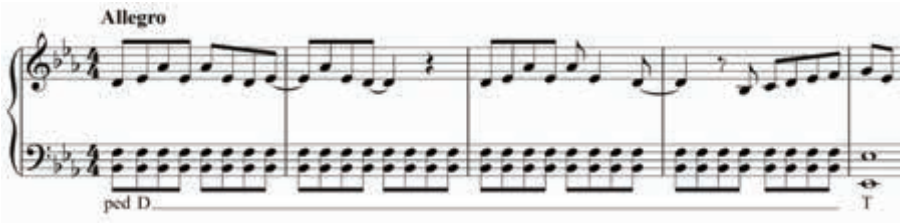
[60] L. H. Shaffer, "Performances of Chopin, Bach and Bartok: Studies in Motor Programming", *Cognitive Psychology*, 13, 1981, 326.

[61] Diana Deutsch, "The generation of two isochronous sequences in parallel", *Perception & Psychophysics*, 34, 1983, 331.

[62] R. T. Krampe, R. Kliegl, U. Mayr, R. Engbert, op. cit., 229.

As the element of folk tradition, the empty fifths used as drone sounds frequently appear in ABBA's songs (Example 8).

Example 8: Drone in ABBA's song "Under attack"



Folk and world repertoire found within a typical Orff-Schulwerk curriculum mostly contain repetitive melodic and rhythmic patterns in the form of ostinato and drone.[63] He believed that these accompaniment techniques are parts of elemental music, because they can be found in music-making of primal cultures and children's expressions, as they correspond to the development of a child.[64] One highly successful model for covering popular songs in the Orff-Schulwerk classroom includes melodic and rhythmic ostinato on percussion instruments.[65]

Orff-Schulwerk teaching strategies

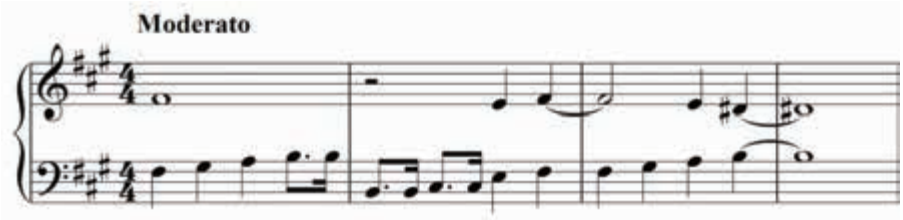
Orff-Schulwerk teaching strategies could be adapted to popular music repertoires and especially to rock music, as it is mostly constructed on modal, pentatonic and blues notes.[66]

Dorian mode

Though the tonality of popular music is largely diatonic, there are many modal popular songs. In Example 9, the lower voice brings the melody – the scale in F flat minor without the sixth tone. The upper voice adds the major sixth at the end of the phrase, creating the Dorian mode in the melody and the major subdominant in the harmony. The missing sixth in the basso melody appears in the cadence as the major sixth in the voice part, completing the Dorian scale.

[63] Carl Orff, *The Schulwerk*, transl. by M. Murray, Mainz, Schott Music, 1978.
[64] Doug Goodkin, *Play, sing & dance: An introduction to Orff Schulwerk*, Miami, FL, Schott Music Corporation, 2002.
[65] Martina Vasil, op. cit., 27.
[66] Brett Clement, op. cit., 3.

Example 9: Dorian mode in ABBA's song "The name of the game"



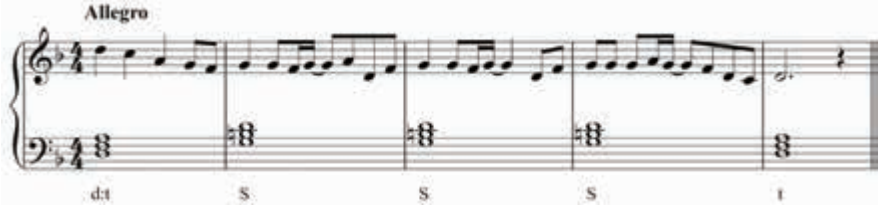
Pentatonic scales

The pentatonic appeared much before diatonic modes. Orff believed that the gradual progression from pentatonic to diatonic modes closely corresponds to the development of the child.[67]

The plagal leading tone was an innovation in the history of tonal melody and presents a relaxation of classical stepwise scale degree tendencies.[68] Most frequently, in the pentatonic scale, the sixth becomes a "plagal leading tone" – its resolution is upward to the tonic tone, while its harmonization is in the context of a plagal cadence. However, the sixth might go downward into the third and not upward to the tonic, provoking associations to parallel minor, so typical of the classical music style.

In the following song by ABBA (Example 10), both classical and non-classical trajectories of the tonal tradition are included. The pentatonic scale (as a classical inheritance) is transformed into pop sound: a) horizontally – through the absence of the sixth in the melody; 2) vertically – through the use of tonic and major subdominant chords; and 3) temporally – through the structure, is a five-bar phrase.

Example 10: The pentatonic scale in ABBA's song "Gimme gimme gimme"



[67] Carl Orff, op. cit.

[68] Jeremy Day-O'Connell, "Debussy, pentatonicism, and the tonal tradition", *Music Theory Spectrum*, 31, 2009, 229.

Students first need to recognize the pentatonic scale by ear, and then convert it into solmization. After they recognize the harmonic progression by ear (the tonic and major subdominant), they sing the solmization along with playing simplified chords in the accompaniment. Students can also create a song by using the same two chords in different order and duration as the accompaniment to the pentatonic melody of their own.

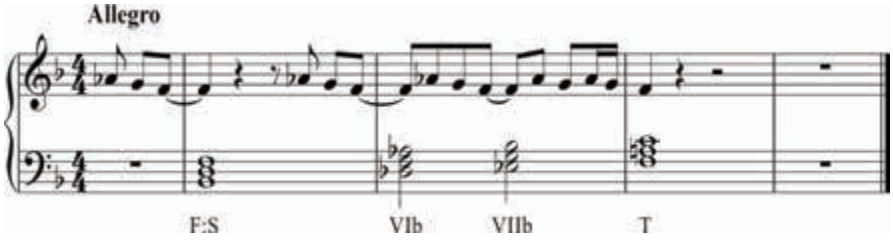
Blue notes

A characteristic feature of pitch organization in rock is the use of both third and lowered third within a song, which is called a mediant mixture.[69] Therefore, a mediant mixture itself might be considered an aspect of "blue note" usage. Gliding between these two tones is an essential characteristic of blues.

A general tendency of melody is to follow harmony, even though this tendency is weaker in rock than in some other styles.[70] In the following example (Example 11), in each case, the melodic degree of the lowered third fits the harmony: first it occurs over the subdominant chord, then over the flat-six chord and flat-seventh chord. It means that a mediant mixture coincides with the chromatic mediant chord (the flat-six).

In the song "S.O.S.", just like in many rock songs, the verse is in a minor key while the chorus is in its relative major. It has been found that the formal position is an important factor in using the mediant mixture – the lowered third is often favored at cadential moments – like the use of "Picardy third".[71]

Example 11: The blue note in ABBA's song "S.O.S."



[69] D. Temperley, I. Ren, Z. Duan, "Mediant Mixture and 'Blue Notes' in Rock: An Exploratory Study", *Music Theory Online*, 23(1), 2017.
[70] Ibid.
[71] David Temperley, "Scalar Shift in Popular Music", *Music Theory Online*, 17(4), 2011.

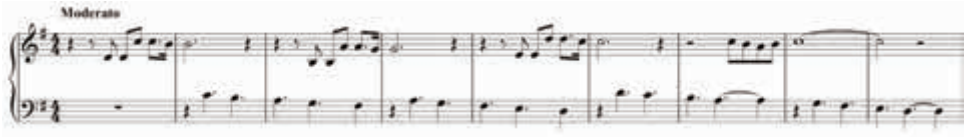
The mediant mixture has contrasting expressive connotations – positive and negative – as it brings strong associations to major and minor keys.[72] It is possible that these connotations follow the expressiveness of the lyrics. In ABBA's "S.O.S." at the end of the chorus, in the line "When you're gone, how can I even try to go on?" there is a shift to lowered third, reflecting the more pessimistic tone of the lyrics.

Emotional analysis of ABBA's songs

Strong emotional responses, such as the experience of chill, are achieved through sudden solo pieces that emerge from a richer orchestral background.[73] The switch between thick and thin texture gradually creates a dynamic and textural climax and, consequently, highly emotional responses.[74] Most likely, a strong emotional reaction can be achieved by gradually adding voices, while its opposite may be reached by doing the opposite in the music. This gradual increase of emotional experience through the gradual addition of voices is used for pedagogical purposes.[75] Namely, students first sing the refrain in unison (Example 12). Then they sing a two-voice melody of the refrain (Example 13). Finally they sing a three-voice melody (Example 14).

Example 12: Unison melody of the refrain of ABBA's song "The Winner Takes It All"

Example 13: Two-voice melody of the refrain of ABBA's song "The Winner Takes It All"



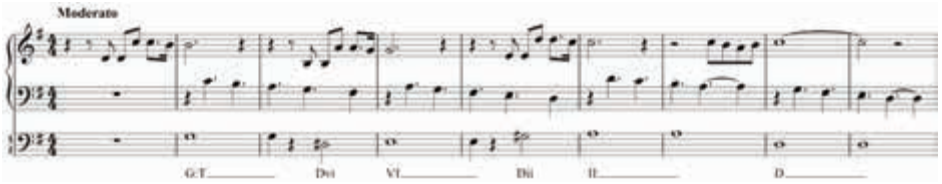
[72] D. Temperley, I. Ren, Z. Duan, op. cit.

[73] Jaak Panksepp, op. cit., 193; M. Guhn, A. Hamm, M. Zentner, "Physiological and Musico-Acoustic Correlates of the Chill Response", *Music Perception*, 24(5), 2007, 473.

[74] Meghan Goodchild, op. cit., 7.

[75] Милена Петровић, op. cit., 2021, 145–146.

Example 14: Three-voice melody of the refrain of ABBA's song "The Winner Takes It All"



Listeners are emotionally moved by the chain of dominants in the refrain of this song, because of the motion that dominants bring into music and their anticipatory nature. It has been proven that specific harmonic patterns elicit tears, increase of heart rate and chills – a strong emotional response involving goose bumps, shivers, or tingles down the spine.[76] Popular music offers a great field for exploring the relationship between chords and emotions, because it shows a clear connection between the use of harmonies and the content of the lyrics. While the aim of high-art music is to express emotions, popular music's aim is to evoke emotions in listeners,[77] often chills[78] and nostalgia.[79]

Linguistic analysis of ABBA's songs

Linguistics might be relevant to the musical analysis of popular songs, as it shows interactions between various aspects of the linguistic and musical dimensions and the complex relationship between music and speech. First, lyrics should be freely translated into the Serbian language by following the main idea of their content. Lyrics in Serbian have the role of bringing the meaning of the original lyrics closer to students. In the Serbian translation it is important to use rhymes, as their role is to make the melody easier to remember and perform. Rhyme is equivalent to the musical tonal center and corresponds to the central principle, in the same way in which the focus of tonal

[76] John A. Sloboda, "Music Structure and Emotional Response: Some Empirical Findings", *Psychology of Music*, 19(2), 1991, 110.

[77] Emery Schubert, "Emotion in Popular Music: A Psychological Perspective", *Volume!,* 10(1), 2013, 5.

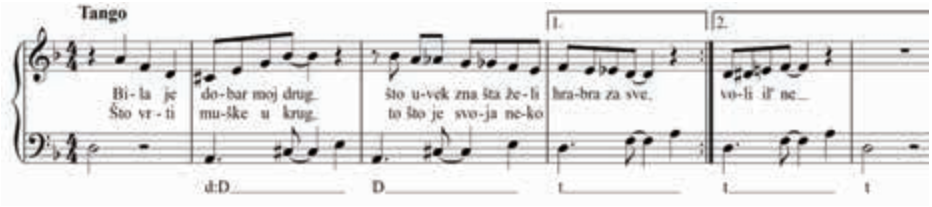
[78] V. N. Salimpoor, M. Benovoy, G. Longo, J. R. Cooperstock, R. J. Zatorre, "The Rewarding Aspects of Music Listening Are Related to Degree of Emotional Arousal", *Plos One*, 2009, https://doi.org/10.1371/journal.pone.0007487

[79] Simon Frith, *Performing rites: On the value of popular music*, Cambridge, MA, Harvard University Press, 1996, 211.

harmony is presented by the basic chord. Therefore, rhymes do not exist in Ancient Greek poetry, just like there was no harmony in Ancient Greek music. One finds the rudiments of rhyme only in the epoch in which the rudiments of polyphony originated.[80] The cadence could correspond to the rhyme principle of the verse ending which helps in verse memorization.

As there are four two-bar segments in the phrase (Example 15), I used cross rhymes – each rhyme for the same cadence – so students can connect the vertical echo of a rhyme with the same musical (harmonic) situation. The first rhyme (drug/krug) appears on the seventh chord (bars 2 and 6), and the second rhyme (sve/ne) appears on the tonic (bars 4 and 8). Such a hierarchical structure of cadence and rhyme, reflected in visual notation and aural perception alike, has influenced some authors to consider rhyme as either a graphic or a musical issue.[81]

Example 15: ABBA's song "Head Over Heels"– rhyming makes the chromatic scale easier to perform and remember



The chromatic scale (bars 3–4 and 7–8) would be easier to perform if it were sung with the lyrics first, but also if a strong accent were put on the initial syllables (in the capital letter) in the following lyrics: "što U-vek ZNA šta ŽE-li HRA-bra za SVE" (bars 2 and 3) or "to ŠTO je SVO-ja NE-ko VO-li IĽ NE" (bars 7 and 8).

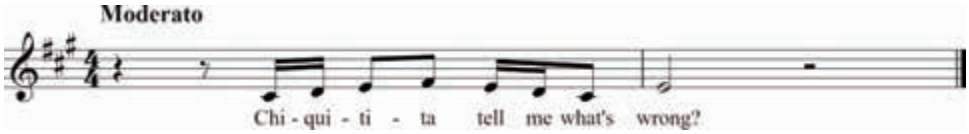
[80] Milena Petrović, "Cadenza as Music Projection of Rhyme in Serbian Romantic Lied", In: Steven M. Demorest, Steven J. Morrison, Patricia S. Campbell (Eds), *Book of Abstracts ICMPC11,* Seattle, University of Washington, 2010, 128.

[81] Милена Петровић, *Улоīа акценīа у срūској солоūесми*, Београд, Службени гласник, 2014; Milena Petrović, "Non-isochronous meter in poetry and music", in: Jane Ginsborg, Alexandra Lamont (Eds), *Proceedings of the Ninth Triennial Conference of the European Society for the Cognitive Sciences of Music*, Manchester: Royal Northern College of Music, 2015, 656–660.

Incorporating linguistic prosody into music is the process called "text setting".[82] When setting lyrics to melody, composers tend to align the expected stress of the lyrics with strong metrical positions in the music. From a pedagogical point of view, songs that are well-aligned are easier to memorize.[83] It has been established that the alignment of linguistic stress and musical meter in a song enhances the musical beat tracking and comprehension of lyrics.[84]

In Western art and popular song, prosodic stress tends to align with musical meter, but also with the melodic contour.[85] The initial motif of the song presents a perfect alignment of linguistic accent, musical meter and melodic contour in the name of Chiquitita: the eighth rest is followed by two sixteens and two eighth notes (Example 16).

Example 16: Linguistic stress, musical meter and melodic contour alignment in ABBA's song "Chiquitita"



Conclusion

The use of ABBA's songs in music pedagogy has required the creation of a new interdisciplinary approach which introduces: 1) the use of elements of informal musical practice in the formal university solfeggio classroom, and 2) the comprehensive multimodal experience and analysis, from which reproduction and performance emerge.

On the one hand, features of informal learning practices are: group work, structural listening and learning by ear, discovering solmization and harmonic progressions, the integration of listening, singing and playing. On the other hand, multimodal experience and analysis involve: the *physical space* of melodic contours and harmonic progressions that are graphically repre-

[82] R. L. Gordon, C. L. Magne, E. W. Large, "EEG Correlates of Song Prosody: A New Look at the Relationship between Linguistic and Musical Rhythm", *Frontiers in Psychology*, 2, 2011, 352.
[83] H. Gingold, E. Abravanel, op. cit.
[84] R. L. Gordon, C. L. Magne, E. W. Large, op. cit.
[85] C. Palmer, M. H. Kelly, op. cit.

sented; *embodied* tension and relaxation caused by the expected and unexpected harmonic patterns/progressions, form and rhythm; *aural and visual* analysis of modes, pentatonic and blue tones as the main Orff-Schulwerk teaching strategies, and ostinato and drone as the elemental characteristics of popular music; *emotions* experienced at the moment of the gradual addition of voices and the chain of dominants; *verbality* reflected in translations, the use of rhyme and the alignment of prosodic stress, musical meter and melodic contour.

Aural, visual, spatial, graphical, verbal, embodied and emotional aspects are found in popular songs and provide a very important means for education. Multimodality, which includes the physical space of melody and harmony, embodied expectations, experienced emotions and verbality, provides enormous opportunities for new directions in the field of music pedagogy.

Translated by the author

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Summary

To institute popular music pedagogy and to include popular music in university solfeggio teaching, principles that are typical of informal learning practices should be applied (Green, 2006). Teaching ABBA's songs in formal university solfeggio classes involves: learning the music that students know and like; learning by structural listening and playing recordings by ear; music as sound rather than music as notation; learning in groups; reliance on improvisation; learning through the integration of listening, singing and playing (Green, 2008). Furthermore, the ABBA's songs analyzed are arranged for the voice and piano accompaniment (the song collection "Mamma Mia", 1976) and thus formally familiar to students, because this kind of arrangement is reminiscent of the classical Lied.

The aim is to propose a new concept of multimodal experience and the analysis of ABBA's songs, which includes an interdisciplinary musicological and pedagogical approach. It consists of: the graphical representation of the melodic contours of the vocal part, parallel with harmonic progressions (Middleton, 1993); expectations in music and the analysis of tension and relaxation according to expected and unexpected harmonic patterns and progressions, form and rhythm (Miles et al., 2017); the music analysis of ostinato and drone as the elemental characteristics of popular music, and the Dorian mode, pentatonic and blue tones, which are part of Orff-Schulwerk teaching strategies (Orff, 1978); emotion analysis in relation to the gradual addition of voices and the chain of dominants (Goodchild, 2016); linguistic analysis, respecting the use of rhymes in verse translations into Serbian, as well as prosodic stress, musical meter and melodic contour alignment (Petrović, 2014).

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ECO-PIANO MODEKAL

Abstract: For the major part of contemporary composers, the main field of interest is electroacoustic music. On the one hand, the capabilities of classical instruments often no longer satisfy composers – they see more creative potential in music programming; on the other hand, this interest is driven by the composers' desire to have their composed works performed, the realization of which is much easier at the expense of technologies. These trends have clearly created a shortage of new sounds in instrumental music. It is important to maintain instrumental music and to make its existence suitable for the modern environment. To solve this problem, an upright piano "Zarya" was modified according to the principles of modern musical thinking and very topical ecomusicology into the piano called ModEkAl. The modified piano is a new type of piano constructed for the artistic research 'Has Piano Music Come to an End?' conducted by composer Eka Chabashvili and pianists Nino Jvania and Tamar Zhvania. The piano was modified according to Chabashvili's scheme which was enriched with the ideas of piano master Alexander Zirakashvili. The paper describes the modified instrument in detail, and introduces a new notation system designed exclusively for the ModEkAl.

Keywords: modified piano; eco-piano; artistic research; new notation; new tuning system.

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Introduction

A musical instrument always echoes the epoch it was created in. With its structure, tuning system, and performance techniques, it could be considered a musical chronicler that tells a lot about the musical aesthetics of the age it belongs to. The principles of musical thinking characteristic of any new epoch lead to the transformation of an instrument, its renewal, refinement, or the enrichment of its performance technique. Each era adapts the instrument to the principles of the corresponding musical thinking so that the instrument's sound has a truly contemporary essence. When modifying any instrument, it is necessary to take into consideration the cultural memory stored within it. We have numerous vivid examples of instrument modifications (ancient and modern flutes, antique hydraulic and contemporary electronic organs, etc.). In all cases, the instruments retain their essence.

The purpose of the article is to present a modified piano ModEkAl and to describe the principle and process of modification. Experiments were carried out on the piano "Zarya" manufactured in the Soviet Union in the 70s of the previous century. The piano was modified according to composer Eka Chabashvili's scheme which was enriched with some ideas of piano master Alexander Zirakashvili. The name of the instrument derives from a combination of the names of its creators – Piano Modified by Eka and Alexander.

The ModEkAl was constructed as the outcome of the artistic research work "Has Piano Music Come to an End?" conducted by the composer and two pianists, associate professors of the Vano Sarajishvili Tbilisi State Conservatoire, Nino Jvania (pianist), Eka Chabashvili (composer), and an assistant professor Tamar Zhvania (pianist), respectively.

The artistic research title alludes to the words of Karlheinz Stockhausen, one of the most influential composers of New Music. "(P)iano music has come to an end and something quite different is coming. I see it clearly: with the claviers made up to this time, there is nothing new to discover any more", declared Stockhausen in 1992.[1] As Nino Jvania states,

> It is difficult not to agree with the German composer who nevertheless continued to compose for piano both before and after 1992. However, the fact is that contemporary composers engage themselves less and less with the piano – particularly as a solo instrument. [….] It is difficult to imagine what further innovations

[1] Karlheinz Stockhausen, "Clavier music 1992", *Perspectives of New Music*, 31 (2), 1993, 138.

> the acoustic piano could present to listeners, even with the addition of electronic technologies. So, has piano music really come to an end? One of the best ways to answer it is to conduct an artistic research.[2]

The birth of the pianoforte was a response to particular ongoing processes in music. Because of radical changes happening in art music since the second half of the 20th century, the piano faced a certain crisis Stockhausen speaks so openly about. The concept of a musical sound has been re-evaluated which resulted in the integration of noises in music on one hand, and the employment of technologies in music production and composition on the other. As a result, to paraphrase Stockhausen, timbre and timbre-oriented pieces gain in importance, whereas monochrome pieces are almost ignored.[3] Despite conceding leading positions, piano music attempts to support these changes. Since the piano *replaced* its predecessors, it has constantly been developing, including improvement of the mechanism, changes in size, etc. In the new epoch, the abilities of the piano are expanding further, resulting in the emergence of prepared and quartertone pianos, the development of extended techniques, etc. In this context, it seemed very logical to create a new, modified version of the piano within the framework of this particular artistic research.

1. Modification of the Piano and its Transformation into the Eco-Piano

"Let us take thought, of how music may be restored to its primitive, natural essence; let us free it from architectonic, acoustic, and esthetic dogmas," declared Ferruccio Busoni in his "Sketch of a New Esthetic of Music" at the beginning of the 20th century, predicting future interest in the ecology of music and sound.[4]

The most urgent challenge of the 21st century is ecology; many teachings aim to awaken the awareness of people to protect our environment, to save our planet and humanity. The search for ways to solve environmental prob-

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[2] Nino Jvania, "Composer-Performer Interaction as a Source of Idea Generation: Presenting Artistic Project 'Piano of the 21st Century and Its Future Perspectives", in: Aleksandra Pijarowska et al. (Eds), *Music – the Cultural Bridge: Essence, Contexts, References*, Wroclaw, Akademia Muzyczna im. Karola Lipińskiego we Wrocławiu, 2021, 273.

[3] Karlheinz Stockhausen, "Japanische Klaviermusik", in: Dieter Schnebel (Ed.), *Texte zur Musk:1963–1970*, Band 3, Koeln, DuMont Buchverlag, 1971, 348.

[4] Ferruccio Busoni, *Sketch of a New Esthetic of Music*, transl. by Dr. Theodore Baker, New York, G. Schirmer, 1911, 34.

lems is a topical issue in almost every field, including music, because sound and music itself are part of the Earth's ecosystem. Therefore, they can positively or negatively affect the environment. In 2011, Aaron Allen posted a question: "Is the environmental crisis relevant to music—and more importantly, is musicology relevant to solving it?"[5] This question is logical and topical nowadays too. All events should serve the protection of the natural environment, be it the processes or the results of geographical, industrial, psycho-physiological, or artistic projects.

If Stockhausen's prediction about *something quite different that is coming* is, to a certain extent, relevant today, like the need for a new instrument was topical three centuries ago, our modified piano could be regarded as one of the keyboard instruments that answers the demands of music of the present and the future.

The piano was modified based on approaches characteristic of contemporary musical thinking and ecomusicology. Thus, we set the task to create an eco-friendly piano. During the modification process, the main focus was set on:

- The timbre that could be considered the most important sound parameter in contemporary professional music;
- The tuning system; we tried to incorporate into the tuning process the natural sound characteristics and to choose the harmonic sequences of fundamental tones as the main source for the tuning.

The main goal during the piano modification process was to combine the cultural memory archived in the instrument with the principles of 21st-century musical thinking. Consequently, the instrument's creators aimed:

- To maintain the basic principle of operation of the instrument's mechanism – producing the sound by hitting a hammer on strings and employing the pedals;
- To maintain the traditional form of the instrument's sound production – playing the keys.

The piano was modified based on the accumulated information and experience in the field of extended piano techniques of the 20th and 21st centuries. The ModEkAl creators hope to offer to contemporary composers and

[5] Aaron S. Allen, "Ecomusicology: Ecocriticism and Musicology", *Jorunal of the American Musicological Society*, 64 (2), 2011, 392.

listeners a version of a piano that is oriented towards the innovative performance methods that were developed by various composers over the last few centuries, thus bringing the instrument closer to the musical thinking of our epoch.

Consequently, the main aims of piano modification were:

- To develop new means of sound production;
- To expand the range of piano timbre;
- To modify the tuning system of piano that is based on equal temperament in a free and more natural way;
- To create a more comfortable environment for the production of the piano sonorities of the 21st century, taking into consideration advanced piano performance techniques developed by composers in the last two centuries.

To achieve these aims, the following changes were made while modifying the instrument (Figure 1):

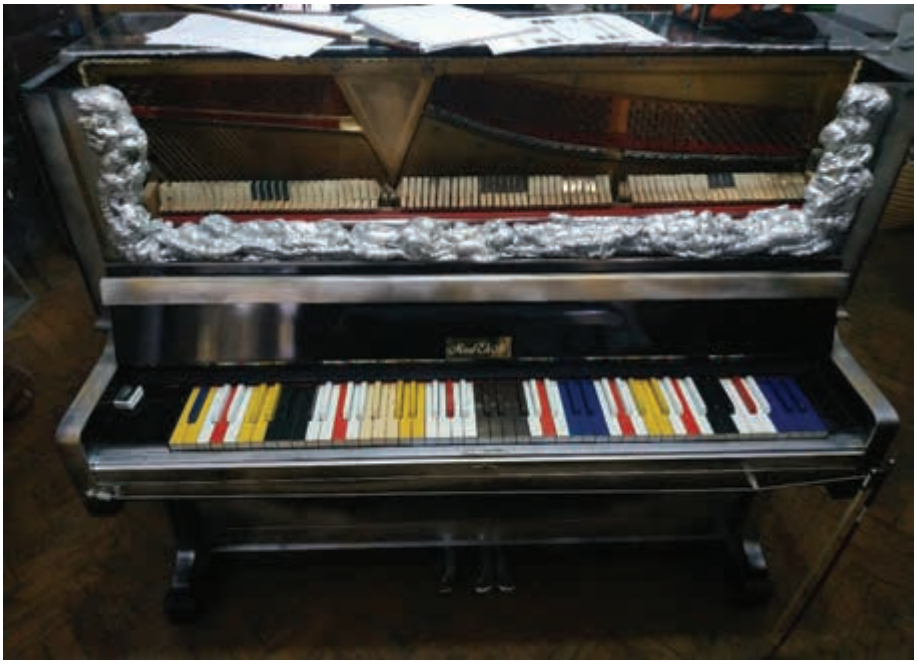


Figure 1: The ModEkAl

- A harp string has been attached to the instrument's body in front of the keyboard;
- The functions of the piano pedals have been modified;
- Various materials have been attached to the hammerheads;
- The strings of the instrument have been tuned according to the principles of microtonal music and the atomic-nuclear musical system;
- As a result of changing the tuning system, the keys were painted in different colours for orientation purposes;
- The instrument's body has also been changed for the convenience of playing in the strings – the wood-covered part of the modified piano body has been partly cut out and replaced with a polycarbonate sheet attached to the top board hinge. The sheet can be removed during playing.

Let's describe all those modifications in a more detailed way.

A harp string attached in front of the keyboard can be used for various ways of sound production. The pianist can play the string imitating any string player, sliding along the string with the left-hand fingers, determining the pitch, and playing it with a bow using the right hand. He can produce various effects on this string, such as pizzicato, overtones, glissando, sul ponticello, saltando, etc. The string can even be played simultaneously with the keyboard if the pianist uses the thumb of his left hand (that plays the keyboard) for moving along the string and employs his right hand to pluck the string or play with a bow. The string is connected to the resonator board to sound at the appropriate volume. They are connected with the 60 cm long wooden stick through the hole on the key-bed (Figure 2). One end of the stick touches the board and the other end is covered with metal that serves as a bridge for the string stretched between the side arms of the piano. The piano tuning-pin attached to the right side arm of the piano is used for tuning the string.

The pedal system (Figure 3) of the ModEkAl includes three pedals (initially the upright piano "Zarya" had two pedals); they have two different functions: the left pedal produces overtones, the middle and right pedals sustain the sound.

(1) *Sustain (damper) pedals*. The right damper pedal of the upright piano was transformed into two independent pedals. A new (middle) pedal was added with the function of partially opening the dampers (thereby, the instrument creators restored the idea of the John Broadwood and Sons' piano pedals dating back to the 18th and 19th

centuries); the middle pedal affects only the lower registers (up to the fourth octave), the right pedal – only the upper registers (starting from the fourth octave up to the seventh octave). The mechanism of the middle pedal works like a typical sustain pedal, but it affects only the dampers in the low register because the damper lift rod is shortened. The mechanism of the right pedal works differently: the pedal rail is located on the right side; it is connected with the pedal rod and when the pedal is activated it moves up and pushes at the same time another additional pedal rod that moves down and affects the damper lift rod, which opens the dampers of the strings in the high register. To open the dampers of the strings in all the registers, the pianist can depress the middle and right pedals with the right foot that adds the fourth function to the pedal system.

Figure 2: The wooden stick connecting the harp string to the resonator board

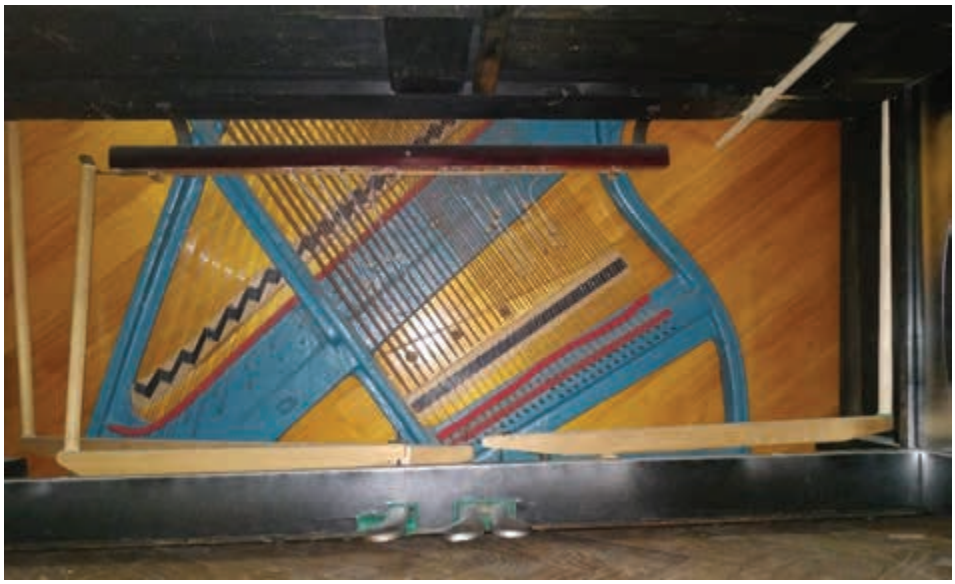


Figure 3: The pedal system of the ModEkAl

(2) *Overtone pedal*. The soft pedal of the "Zarya" piano has been converted into an overtone pedal. The left pedal can be fixed as a harp pedal. It has two functions: when not pressed down, it produces overtones, and when pressed down, it produces the regular pitches. The mechanism that produces overtones is attached to the key-bed. This is an additional rail (defined by us as an *overtone rail*), to which several wires of different lengths are attached. One damper drum is put on each wire and each wire serves one string. When the pedal is not pressed down, being in an open position, the damper drums softly touch the strings and produce overtones. It is possible to move the damper drums along the wires and change the overtones. However, this mechanism functions only in the case of ten white keys in the low register. In the case of the grand piano modification, it would be possible to produce overtones of all the white keys. The soft pedal rail of the "Zarya" has been left untouched and the pedal rod was shortened. When the left pedal is pressed down, the soft pedal rod pushes the half-blow arm connected with the new overtone rail with wires and damper drums, the rail moves up from the strings and the ModEkAl produces regular pitches.

The cover materials of the hammerheads have been replaced with various materials: 39 hammerheads were left untouched, covered with felt, the others were covered with wood (14), metal (12), rubber (9), leather (7), and cardboard (4). The materials of the hammerhead covers affect the timbre, dynamics, and weight of the keys. Hammers covered with rubber and metal are regulated through piano key leads so that the corresponding keys do not become too heavy.

The keyboard has been significantly influenced by changing the hammerheads' materials and the tuning system. The ModEkAl's coloured keyboard represents a combination of Acoustic Islands and Timbre Spaces, the concept of which is based on the tuning system of the ModEkAl.

- *Acoustic Islands* – red and white keys of the modified piano defined by us as musical Atoms. Hammers connected with the keys representing Acoustic Islands were left untouched – covered with felt;
- *Timbre Spaces* – keys of various colours between Atoms tuned in the ModEkAl's tuning system. Key colours indicate the materials used to cover hammerheads that determine the character of the timber: the yellow keys are associated with wooden hammerheads; blue – with metal; brown – with leather; black – with rubber, and beige – with cardboard.

The keys have been painted in different colours to help the pianist to orientate while playing.

2. Tuning System of the ModEkAl

2.1 Description of the ModEkAl's Tuning System

While modifying the instrument, we aimed at choosing the particular principle of the piano tuning system that would make the instrument a part of an ecosystem. Absolute symmetry does not exist in the universe and it is not typical for the ecosystem either.

The equal temperament tuning system of the piano was replaced by a new, ModEkAl tuning system that is based on the *atomic-nuclear musical system* invented by Eka Chabashvili. This new system includes harmonics of two different fundamental C-tones of the following frequencies: 16.384Hz and 131.072Hz. The ModEkAl has two layers of tuning that cross each other: the sequences of harmonics and randomly taken free frequencies which construct the so-called *Enriched Tones*.

The atomic-nuclear system aims to organize pitches in such a way that they associatively resemble the structure of an atom with electrons *moving*

through acoustic points in different trajectories around the nucleus. However, in the case of the piano, and not orchestra or ensemble, the sound remains rather constant and static. The distance between the extreme pitches of the Atom has to be no less than the interval of 333 cents. The fundament of this musical system is the Enriched Tone representing the central pitch (Nucleus) that is surrounded by several microtones (Electrons). The Enriched Tone contains one or more micro intervals of randomly chosen cents. The structure of the Enriched Tone is not strictly defined; the only rule is that the interval between the extreme tones of the Enriched Tone (Nucleus) has to be no more than 333 cents. The main principle for a model of the Enriched Tone is that it includes micro intervals within the range mentioned above. As for Electrons, they either move or are located around the Enriched Tones on the orbits with different distances from the Nucleus.

The musical Atoms of the modified piano are called Acoustic Islands and there are seven of them in various registers of the ModEkAl. On the keyboard, the centre of each Atom (Nucleus) is painted in red and the surrounding Electrons are painted in white. The coloured keys between the Atoms are Timbre Spaces. There are 10 Timbre Spaces on the keyboard.

On the ModEkAl, each key's corresponding pitch depends on the number and combination of the strings tuned separately to different frequencies. The pitches of the piano keys corresponding to the Nuclei (red keys) are presented with the Enriched Tones (except the Nucleus of the first Atom; this key has only one string). Also, many of the keys with 2 or 3 strings within the Timbre Spaces are tuned according to the Enriched Tone principle. Of course, the lowest 12 keys of the piano cannot produce the Enriched Tones as they have only one string.

The ModEkAl has seven octaves produced within the harmonics sequence of the C-note. Each of the seven octaves of the modified piano contains one Atom. Seven musical Atoms are associated by us with five Carbon and two Oxygen atoms. Carbon and Oxygen are the two main chemical elements that serve as the source for the creation of living organisms. According to Mendeleev's Periodic Table, the Carbon atoms consist of four outer electrons and Oxygen atoms – of six outer electrons arranged around the nucleus. Consequently, each musical Atom associated with Carbon atoms contains five keys (four Electrons plus one Nucleus), and each Atom associated with Oxidant atoms, respectively, has seven keys (six Electrons plus one Nucleus)[6].

[6] Here we see how natural science serves as a source of inspiration for Chabashvili's artistic idea that is implemented within the artistic research project.

2.2 The Tuning Table and Explanations

Table 1 presents the Tuning Table that covers both – equal-tempered tuning and its modification.

Table 1. ModEkAl Tuning Table

Piano keys	Tempered tuning frequencies (Hz)	New tuning frequencies for each string (Hz)		Material for hammers	Other
Sub-contra octave					
A_0 (1 string)	27.50	28.00		Wood	
$A^{\#}_0/B^{b}_0$	29.14	**23.70**		Metal	Bell
B_0	30.87	31.15		Wood	
Contra-octave					
C_1	32.70	33.73			Overtone
$C^{\#}_1/D^{b}_1$	34.65	**32.768**			Overtone
D_1	36.71	Same			
$D^{\#}_1/E^{b}_1$	38.89	37.76			Overtone
E_1	41.20	39.88			Overtone
F_1	43.65	45.66		Wood	
$F^{\#}_1/G^{b}_1$	46.25	47		Wood	
G_1	49.00	49.152		Wood	
$G^{\#}_1/A^{b}_1$	51.91	51.19		Wood	
A_1 (2 strings)	55.00	52.7	53.5	Rubber	
$A^{\#}_1/B^{b}_1$	58.27	55	57	Rubber	
B_1	61.74	58.7	61	Rubber	
Great octave					
C_2	65.41	**65.536**		Rubber	
$C^{\#}_2/D^{b}_2$	69.30	68	70.30	Rubber	
D_2	73.42	81.92			Overtone
$D^{\#}_2/E^{b}_2$	77.78	75.00			Overtone
E_2	82.41	73.42			Overtone
F_2	87.31	85	Same		

$F^{\#}_2/G^{b}_2$	92.50	90.80			Overtone
G_2	98.00	98.304			Overtone
$G^{\#}_2/A^{b}_2$	103.83	100.59			Overtone
A_2	110.00	105	Same	Cardboard	
$A^{\#}_2/B^{b}_2$	116.54	114.688		Cardboard	
B_2	123.47	125.59	122.00	Cardboard	
Small octave					
C_3	130.81	131.072		Cardboard	
$C^{\#}_3/D^{b}_3$ (3 strings)	138.59	135	138	142	Wood	
D_3	146.83	147.456		Wood	
$D^{\#}_3/E^{b}_3$	155.56	153	158	160	Wood	
E_3	164.81	163.84		Wood	
F_3	174.61	192			
$F^{\#}_3/G^{b}_3$	185.00	186			
G_3	196.00	180.224			
$G^{\#}_3/A^{b}_3$	207.65	196.608	Same	210		
A_3	220.00	212.992			
$A^{\#}_3/B^{b}_3$	233.08	229.376			
B_3	246.94	245.76			
I octave					
C_4	261.63	262.144		Leather	
$C^{\#}_4/D^{b}_4$	277.18	274	278.528	280	Leather	
D_4	293.66	283	294.912	300	Leather	
$D^{\#}_4/E^{b}_4$	311.13	305	311.296	315	Leather	
E_4	329.63	323	327.68	337	Leather	
F_4	349.23	340	344.064	355	Leather	
$F^{\#}_4/G^{b}_4$	369.99	376.832	360.448	409.6	Leather	
G_4	392.00	415			

$G^{\#}_4/A^{b}_4$	415.30		393.216			
A_4	440.00	425.984	Same	442.368		
$A^{\#}_4/B^{b}_4$	466.16		458.752			
B_4	493.88		491.52			
II octave						
C_5	523.25		**524.288**		Metal	
$C^{\#}_5/D^{b}_5$	554.37	475.136	507.904	540.672	Metal	
D_5	587.33	557.056	573.44	589.824	Metal	
$D^{\#}_5/E^{b}_5$	622.25	606.208	622.592	638.976	Metal	
E_5	659.25	660	655.36	679	Metal	
F_5	698.46		740			
$F^{\#}_5/G^{b}_5$	739.99		701			
G_{5s}	783.99	786.432	Same	805		
$G^{\#}_5/A^{b}_5$	830.61		829			
A_5	880.00		850.47			
$A^{\#}_5/B^{b}_5$	932.33	Same	917.504	Same	Wood	
B_5	987.77	Same	950.4	Same	Wood	
III octave						
C_6	1046.50		**1048.576**		Wood	
$C^{\#}_6/D^{b}_6$	1108.73	Same	1080	Same	Wood	
D_6	1174.66		1254			
$D^{\#}_6/E^{b}_6$ (without dampers)	1244.51		1179.648			
E_6	1318.51	1310.72	Same	1365		
F_6	1396.91		1400			
$F^{\#}_6/G^{b}_6$	1479.98		1441.792			
G_6	1567.98	1480	1500	1572.864	Rubber	
$G^{\#}_6/A^{b}_6$	1661.22	1470	1640	1765	Rubber	

A_6	1760.00	1703.936	Same	1800	Rubber	
$A^{\#}_6/B^{b}_6$	1864.66	1835.008	1900	1966.08	Rubber	
B_6	1975.53		2097.152			
IV octave						
C_7	2093.00		1983			
$C^{\#}_7/D^{b}_7$	2217.46	2157	Same	2228.224		
D_7	2349.32		2359.296			
$D^{\#}_7/E^{b}_7$	2489.02		2490.368			
E_7	2637.02	2600	2621.44	2660	Metal	
F_7	2793.83	2700	2752.512	2883.584	Metal	
$F^{\#}_7/G^{b}_7$	2959.96	2900	Same	3014.656	Metal	
G_7	3135.96	3050	3145.728	3200	Metal	
$G^{\#}_7/A^{b}_7$	3322.44	3276.8	3370	3400	Metal	
A_7	3520.00	5407.872	3538.944	3620	Metal	

As one can see, the Atoms don't follow the principle of the horizontal ascending-descending linear arrangement of the pitch order – Electrons surround the Nuclei spatially, on a circular basis. 17 frequencies break the horizontal ascending-descending linear sequence. In the Tuning Table, 10 of them are marked in green, 6 – with various shades of blue (as harmonics are marked with blue and 6 frequencies mentioned above are included in the sequence of harmonics), and 1, the lowest pitch corresponding to the key $A^{\#}_0/B^{b}_0$ is defined as a *Bell*. The pitches of the Electrons don't make the Enriched Tone, even in the section of keys with three strings. The pitches of the Electrons in two lower register Atoms can be replaced with the overtones produced with pedals.

Here is the list of musical Atoms that contain the central Enriched Tones surrounded by the Electrons (in the Tuning Table the Nuclei are marked in

red and the Electrons – in white). The note names correspond to the traditional piano key layout:

- Atom I-Centre D [C_1-E_1; Island's area=340.05cents] +4 electrons (transforming into overtones);
- Atom II-Centre F [D_2 – $G^{\#}{}_2/A^{b}{}_2$; Island's area=545.09cents] the Enriched Tone with one micro interval [46.42cents] +6 electrons (transforming into overtones);
- Atom III-Centre As [F_3 – B_3; Island's area=536.950cents] the Enriched Tone with three micro intervals [114.08cents] +6 electrons;
- Atom IV-Centre A [F_5 – A_5; Island's area=386.313cents] the Enriched Tone with three micro intervals [65.337cents] +4 electrons;
- Atom V-Centre G [D_6 – $F^{\#}{}_6/G^{b}{}_6$; Island's area=334.615cents] the Enriched Tone with three micro intervals [40.4cents] +4 electrons;
- Atom VI-Centre E [G_4 – B_4; Island's area=347.407cents] the Enriched Tone with three micro intervals [70.249cents] +4 electrons;
- Atom VII-Centre Cis [B_6 – $D^{\#}{}_7/E^{b}{}_7$; Island's area=394.409cents] the Enriched Tone with three micro intervals [56.241cents] +4 electrons.

While retuning the piano, we retained the frequencies of several strings, especially of those included in Atoms' Nuclei (in the Tuning Table, 7 retained frequencies are marked in red and indicated by the word *same*). In the sector consisting of three-string notes, the middle strings are tuned based on the equal temperament tuning system, as a central pitch of the Enriched Tone, the other two strings are tuned higher and lower to various frequencies. The nine strings of the Timbre Spaces also retain their original frequency (the colours which indicate the keys of the Timbre Spaces in the Tuning Table are the same as on the keyboard).

The tuning of 63 strings out of 215 is based on the 39 harmonics of the fundamental C-tone of 16.384Hz and 27 harmonics of the fundamental C-tone of 131.072Hz; they share three harmonics (in the Tuning Table, 39 harmonics are marked in blue, 27 harmonics – in green-blue; three common harmonics are also marked in green-blue, and the harmonics producing C pitches in different registers are given in dark blue).

The ModEkAl has seven perfect octaves given between the C pitches (in the Tuning Table the C pitches are marked in dark blue):

I – 32.768Hz – $C^{\#}_1/D^{b}_1$ Key (I Atom)
II – 65.536Hz – C_2 Key (Timbre Space of rubber hammerheads)
III – 131.072Hz – C_3Key (Timbre Space of cardboard hammerheads)
IV – 262.144Hz – C_4Key (Timbre Space of leather hammerheads)
V – 524.288Hz – C_5Key (Timbre Space of metal hammerheads)
VI – 1048.576Hz – C_6Key (Timbre Space of wooden hammerheads)
VII – 2097.152Hz – C_7Key (VII Atom)

One hundred strings out of 215 belong to the Acoustic Islands, where 21 strings of Atoms are tuned within harmonics sequences. 115 strings belong to the Timbre Spaces, 42 strings of them are tuned within the harmonics sequences. One hundred and fifty-two strings are freely tuned based on the principle of the relationship between the frequencies based on the atomic-nuclear music system. One hundred and four strings produce Enriched Tones, 17 of them belong to the keys of Nuclei, 87 strings of 104 belong to the keys of the Timbre Spaces.

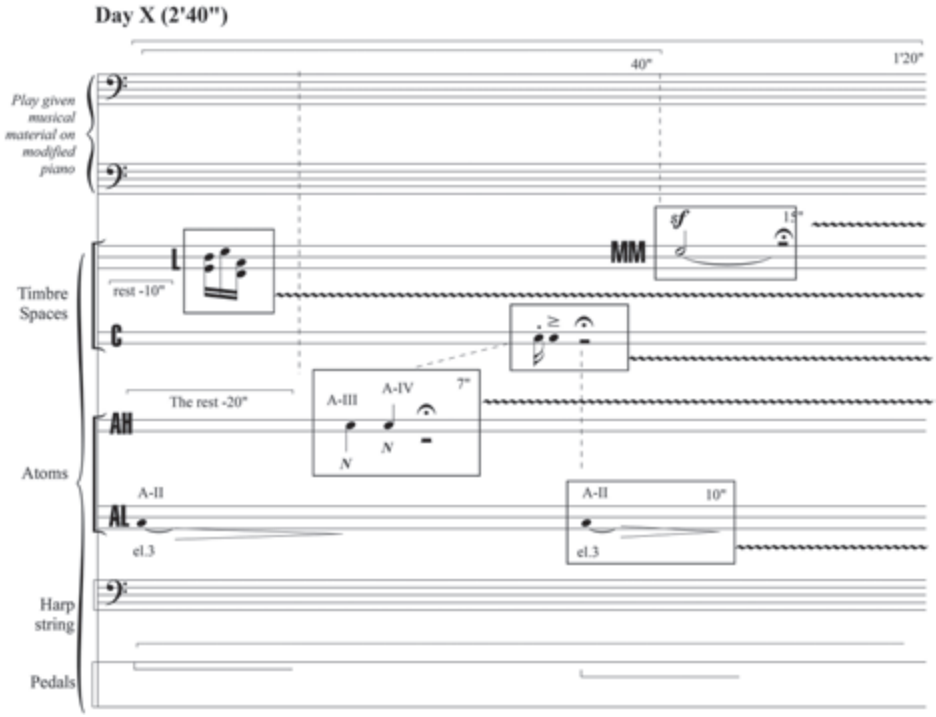
The ModEkAl contains 37 Enriched Tones; six of them are Nuclei within Acoustical Islands (six Atoms), and 31 Enriched Tones are distributed within the Timbre Spaces of various registers:

- The Timbre Space of the metal hammerheads contains 10 Enriched Tones;
- The Timbre Space of the rubber hammerheads contains 8 Enriched Tones;
- The Timbre Space of the leather hammerheads contains 6 Enriched Tones;
- The Timbre Space of the wooden hammerheads contains 5 Enriched Tones;
- The Timbre Space of the cardboard hammerheads contains 2 Enriched Tones.

3. The ModEkAl and Notation

Modifying the instrument has led to the creation of corresponding notation. Figure 4 presents the ModEkAl part from the score of the piece *Anamnesis of Covid-19* (Figure 4).

Figure 4: *Anamnesis of Covid-19*, score



There are 7 staves used for the distribution of the musical material played on the ModEkAl. The upper 2 staves are intended for the Timbre Spaces to be played with both hands. The Timbre Spaces are designated by the abbreviations where the first letter indicates hammerhead material: W-wooden (yellow keys), M-metal (blue), L-leather (brown), R-rubber (black), and C-Cardboard (beige). Particular materials are used to cover the hammerheads in different registers. To define the registers, the composer uses the second letter of the abbreviations indicating the location of the keys in either the High, Middle, or Low registers (for instance, WH means the Wooden hammerhead in the High register). The abbreviation corresponding to the lowest three keys is WMW (Wooden-Metal-Wooden).

The next 2 staves are intended for Acoustic Islands (Atoms). Instead of clefs, for the high and low register Atoms are used with the abbreviations AH and AL. On the staves presented by two or three lines, written notes indicate key locations within particular Timbre Spaces or Acoustic Islands.

The ordinary five-line staff belongs to the harp string – open string E.

The lowest 2 lines are given for pedals: the upper line – for the middle and right pedals used for the High and Low registers and the other line – for the left overtone pedal with two positions indicated either by F (flageolet) or Ord. (ordinary – the pedal is pressed down).

Seven Atoms are numbered starting from the lowest AL(ow) – I, II, III (keys Nos. 1–39) to the high register – IV, V, VI, VII (keys Nos. 40–85). The number of the Atom is notated above the staff: for example, A-I, A-II, etc.

Notation of Atoms. The pitches constituting Atoms are written on a two or three-line staff system. Nuclei are written in the middle of the staff lines. They are denoted by the Latin Letter *N*. Around the Nucleus the Electrons are located, which are indicated by the Latin letters *el.1, el.2,* etc. The Electrons are marked according to their left-to-right position on the keyboard.

Seven Atoms are presented on the keyboard. As mentioned above, 5 of them are associated with Carbon atoms, thus consisting of a Nucleus and four Electrons (in total 5 musical notes), and 2 – with Oxygen atoms consisting of a Nucleus and six Electrons (in total 7 musical notes). Therefore, on the two-line staff system five-note Atoms are notated, and on the three-line system – seven-note Atoms.

Notation of Timbre Spaces. The registers on the keyboard are divided into three parts: High (keys Nos. 57–85), Middle (keys Nos. 29–56), and Low (keys Nos. 1–28). Timbre Spaces located between Atoms are indicated with the Latin letters corresponding to the material of the hammerheads and their location within the particular registers of the ModEkAl. For example, if the hammerhead covering material is Wood, we take the first letter of the word – W and attach it to the first letter of the word in which register this Timbre Space is located: in the upper – H, in the middle – M, in the lower – L.

The symbol of the high register keys with a wooden hammerhead is WH and it has to be written in front of the note on a two or three-line staff system instead of a clef. The notes arranged on the lines correspond to the keys from left to right (the first note is written under the first line of the staff). As these colours are used as a guide when playing on a coloured keyboard, the performer needs to know which colour is associated with which hammer:

M (*Metal*) *blue keys*: MH sounds are located in the Timbre Space of VII Atom; MM sounds – between IV and V Atoms;
W (*Wooden*) *yellow keys*: WH sounds are located between V and VI Atoms; WM – between II and III Atoms; WL – between I and II Atoms;
L (*Leather*) *brown keys*: L sounds are located between III and IV Atoms;
R (*Rubber*) *black keys*: RH sounds are located between VI and VII Atoms; RL – between I and II Atoms;
C (*Cardboard*) *beige keys*: C sounds are located between II and III Atoms.
The lowest 3 keys – *yellow/blue/yellow* – are indicated by WMW (wooden/metal/wooden hammerheads).

Thus, the Timbre Space sounds are notated on the staff lines in a sequence from the bottom to the top; it must be noted that the lowest tone is always written under the first line of the staff and for upper tones additional lines may be required. For example, if brown keys' sounds are placed on a two-line staff, we will need upper additional lines. It is possible to place notes of two or more Timbre Spaces on the same staff (but not over each other). In this case, abbreviators of particular Timbre Spaces have to be written before these notes.

In the score, some excerpts of the piece sometimes are notated on five-line staves with traditional musical symbols. It is much easier for performers to perceive complicated textures imitating the piano repertoire (in our particular case – quotations from various works of previous centuries) denoted by conventional symbols. Thus, music composed for the ModEkAl can be notated traditionally, though notated pitches will sound differently.

4. Conclusion: The Future of the ModEkAl and Piano Music

The main challenge for our research remains the future of the instrument. The question is whether the ModEkAl will be able to go beyond the boundaries of one-time experiments conducted within the research and to establish itself as an instrument that will inspire composers to create new works and encourage pianists to perform them.

We have introduced ModEkAl at various international conferences and forums, as well as festivals (Delft Chamber Music Festival 2021). Several composers have already expressed their interest and wish to compose for the modified piano. That's why we hope we gave our answer to the question reflected in the title of our artistic research.

You can listen to the ModEkAl, as well as the piano piece *Anamnesis of Covid-19* which is part of a large multimedia piano performance "Has Piano Music Come to an End?" at the following link: https://www.youtube.com/watch?v=cDHdQ8uVQvo&t=3686s (the ModEkAl piece starts at 50:17).

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Summary

For the majority of contemporary composers, the field of interest is electroacoustic music. On the one hand, the capabilities of classical instruments often no longer satisfy composers – they see more creative potential in music programming. On the other hand, this interest is driven by the composers' desire to have their works performed, the realization of which is much easier at the expense of technologies. These

trends have created a shortage of new sounds in instrumental music. It is important to maintain instrumental music and to make its existence suitable for the modern environment.

To solve this problem, an upright piano, "Zarya", which was manufactured in the Soviet Union in the 70s of the previous century, was modified according to the principles of modern musical thinking and ecomusicology that is very topical nowadays into the Eco-Piano ModEkAl. The modified piano is a new type of piano constructed for the artistic research entitled *Has Piano Music Come to an End?* conducted by composer Eka Chabashvili and pianists Nino Jvania and Tamar Zhvania. The piano was modified according to Eka Chabashvili's scheme, which was enriched with the ideas of piano master Alexander Zirakashvili. The name of the instrument derives from a combination of the names of its creators – Piano Modified by Eka and Alexander.

A musical instrument always echoes the epoch it was created in. With its structure, tuning system, and performance techniques, it could be considered a musical chronicler that tells a lot about the musical aesthetics of the age it belongs to. The principles of musical thinking characteristic of any new epoch lead to the transformation of the instrument, its renewal, refinement, or the enrichment of its performance techniques. Each era adapts the instrument to the principles of the corresponding musical thinking so that instrument's sound has a truly contemporary essence. When modifying any instrument, it is necessary to take into consideration the cultural memory stored in it. We have numerous vivid examples of instrument modifications (ancient flute, antique hydraulic and contemporary electronic organs). In all cases, the instruments retain their essence.

The purpose of the article is to present the Eco-Piano ModEkAl and to describe the principle and process of modification, as well as to introduce a new notation system designed exclusively for the ModEkAl.

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MEANING MATTERING IN BJÖRK'S *BIOPHILIA* – AN ANALYSIS FROM THE VIEWPOINT OF KAREN BARAD'S AGENTIAL REALISM[1]

Abstract: The aim of this paper is to analyse Björk's transdisciplinary project *Biophilia* in the context of Karen Barad's agential realism. I will compare how matter creates meaning in both the artist's and the researcher's approach from the relationship between phenomena occurring in the physical and 'natural' world. The first part of the article presents the principles of Barad's point of view to a new materialism paradigm and focuses on how matter takes an active role in creating meanings and how it is performatively correlated with an apparatus. This problem also highlights how new materialism approaches an intra-connected realtionship between human and non-human beings. By showcasing this perspective I will try to find similarities in Björk's perspective of creating sound in *Biophilia*. I will analyse the project in terms of relationships between natural phenomena and music theory elements (that Björk connected within the songs), ways of using technology by the Icelandic artist and *Biophilia's* application as a tool with similar characteristics to Barad's apparatus.

Keywords: agential realism, Karen Barad, *Biophilia*, Björk, new materialism, intra-action

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Introduction

In this paper, based on *Biophilia* – a transdisciplinary music project of the Icelandic artist Björk, I will describe how it creates a specific combination of elements derived from issues of music theory and musicology with phenomena occurring in the environment. I will look at this relationship using Karen Barad's agential realism. I will trace how Björk creates a non-distanced knowledge that, like in the new materialism paradigm, is connected to the direct material engagement.[2] Both Björk and Barad start in their investigation from constructing theories to physical phenomena existing in the environment. In this paper I will look at how the shift from matter to discourse is shared by the researcher and the artist. I will also look at the application integral to *Biophilia* as a cognitive tool that performatively reconfigures and actively influences the musical issues under investigation as well as becoming a constitutive part of them.[3] As Barad's agential realism assumes the active role of non-human matter and encourages an openness to this kind of interaction, I will analyze how the relationship between human and nature is formed through sound and technology. I will also use Douglas Kahn's material-energetistic approach to sound arising from being open to the flow of electromagnetic interactions.[4]

Mattering of the world, mattering of the sound

One of the most significant and resonant postulates of Karen Barad's theoretical project of agential realism is the emergence of meaning and discourse mediated by the matter. One particularly interesting feature of the researcher's work is the way in which she sees an analogy between the material and discursive worlds by countering the transcendental and dualistic tradition of separating scientific realism from social constructivism in order to create a common field of meaning through the process of mattering the world.[5] The philosopher built her perspective on the observation that language, interpretation, and semiotics have been assigned too large a role in knowledge pro-

[2] Rick Dolphijn, Iris van der Tuin, *New Materialism: Interviews & Cartographies*, Utrecht, Open Humanities Press, 2012, 52.

[3] Karen Barad, Co jest miarą nicości? Nieskończoność, wirtualność, sprawiedliwość", in: O. Ciemielęcka, M. Rogowska-Stangre (Eds), *Feministyczne nowe materializmy: usytuowane kartografie*, Lublin, E-naukowiec, 2018, 64.

[4] Douglas Kahn, *Earth Sound Earth Signal: Energies and Earth Magnitude in the Arts*, Los Angeles, University of California Press, 2013.

[5] Karen Barad, "Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter", *Journal of Women in Culture and Society*, Vol. 28, No. 3, 2003, 810.

duction, thereby taking away the agency of the matter itself, understood as passive and unchanging or existing 'after' the language and culture as a derivative of them.[6] Karen Barad reverses this direction with her research, suggesting that it is matter that becomes the primary force upon which discourse is constructed. Before crystallizing her proposal for a new materialism, she obtained a PhD degree in quantum field physics, and from this perspective she derives her own transdisciplinary perspective that combines quantum physics theories with feminist theory, science and technology studies, as well as philosophical and cultural studies. Her concept, as she puts it, eliminates the boundaries between the human and the non-human, the material and the discursive, acknowledging the co-constitutivity of all these spheres in relation to reality.[7] To describe this way of understanding and perceiving reality, Barad uses historically important episodes in the development of physical research, such as those related to light radiation, Young's experiment (which involved passing light through two narrow slits in close proximity and observing the resulting image on a screen), measuring the position and momentum of molecules, or Niels Bohr's thought experiment defining the wave-particle nature of matter. It is supported by two concepts that derive from the mechanics of wave propagation – reflection and diffraction (bending of the wave). Based on the contrast between these two phenomena, the researcher draws more general models of producing knowledge.

Barad connects representationalism with reflectivity, which results in the cognition of objects without their constitutive participation in the process. This model positions matter as pre-existing, cognition-independent objects that are free from the deformation of the cognitive apparatus. Matter in this perspective has concretely defined boundaries and separates itself from the subject. The model of reflection (which Barad attributes to the Newtonian, classical way of understanding the principals of physics) thus generates a series of dualistic divisions: between ontology and epistemology, nature and culture, social and environmental space, things and mental constructs (represented by words). Representations, moreover, serve to mimetically find similarities – literal "mirror images" of matter.[8]

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[6] Ibid., 801–802.

[7] Ewa Hyży, "Dzielenie się światem. Nowy feministyczny realizm w ujęciu Karen Barad", in: E. Hyży (Ed.), *Feministyczne konteksty. Multidyscyplianrnie*, Toruń, Wydawnictwo Adam Marszałek, 2017, 63.

[8] Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, Durham–London, Duke Univeristy Press, 2007, 89–90.

In opposition, Barad presents a diffraction methodology derived from both Donna Haraway's theory and the aforementioned experiments within quantum physics, noting that this discipline not only complements Newtonian classical physics, but actually replaces it.[9] Diffraction, unlike reflection, draws attention not to similarities but to the differentiation that takes place between the observed matter and the observer. Barad admits that in an experiment in which a diffraction grating is produced on a screen after a particle has passed through two narrow slits, the arrangement of the pattern between the bands of enhancement and extinction (that is, the arrangement of light and dark bands produced by the interference of light waves) depends on the properties of the device through which the wave is passed[10] (what is meant here is the number of slits and the distances between them).

The researcher describes the diffraction methodology by suggesting Donna Haraway, who describes it as a critical practice for bringing about change in the world. It is a commitment to understanding how differences matter, which differences matter, and for whom. It is a critical practice of engagement, not a learning practice of reflection from a distance. According to agential realism, knowing, thinking, measuring, theorizing, and observing are material practices of acting within and as part of the world.[11]

Barad recognizes that the research apparatus takes an active part in constructing the meaning of the object under study and is onto-epistemologically entangled with it:

> Apparatuses are not inscription devices, scientific instruments set in place before the action happens, or machines that mediate the dialectic of resistance and accommodation. They are neither neutral probes of the natural world nor structures that deterministically impose some particular outcome. In my further elaboration of Bohr's insights, apparatuses are not mere static arrangements *in* the world, but rather *apparatuses are dynamic (re)configurings of the world, specific agential practices/intra-actions/performances through which specific exclusionary boundaries are enacted.*[12]

Barad explains this property of the intertwining of object and subject using the example of Bohr's thought experiment on the study of the position and momentum of a photon, which proves that it is not possible to measure both

[9] Ibid., 110.
[10] Ibid., 91.
[11] Ibid., 90–91.
[12] Karen Barad, "Posthumanist Performativity…", op. cit., 816.

properties with exactly the same precision. It is only by applying a different test instrument against which the photon is supposed to bounce (against a rigidly or movably mounted plate) can reveal and constitute the result that concerns the different property of the matter under study.[13]

Bohr's theoretical concepts are thus revealed and defined with the causal contribution of the physical circumstances needed to make the measurement. The apparatus in Barad's case is thus performative in nature, which actively affects the way knowledge is produced and transformed. The research instrument embodies certain concepts at the expense of others.[14] Barad, in order to maintain methodological consistency, does not use concepts drawn from physics as metaphors illustrating or reflecting models that she will then superimpose on areas occupied by humanistic thought and theory. The researcher grounds and embeds her theories in the living matter that constitutes the perception of reality and defines the philosophical lens. This performativity of entanglement between object, observer, and cognitive tool leads to a constant reconfiguration of

> locally determinate causal structures with determinate boundaries, properties, meanings, and patterns of marks on bodies. This ongoing flow of agency through which "part" of the world makes itself differentially intelligible to another "part" of the world and through which local causal structures, boundaries, and properties are stabilized and destabilized does not take place in space and time but in the making of spacetime itself. The world is an ongoing open process of mattering through which 'mattering' itself acquires meaning and form in the realization of different agential possibilities.[15]

For Barad, objects are bound not by interactions (which would suggest the possibility of subject and object existing independently of each other, entering into a relationship after their own individual constitution) but by intra-actions, a type of relationship that enables the materialization of meanings.[16] This perspective dismantles the metaphysics of individualism by negating the notion that there are individually constituted subjects, times, and places[17] understood as a set of initial data and fixed differences in order to ask how

[13] Karen Barad, *Meeting the Universe Halfway…*", op. cit., 109–115.
[14] Karen Barad, "Posthumanist Performativity…", op. cit., 820.
[15] Ibid., 817.
[16] Karen Barad, *Meeting the Universe Halfway…*, op. cit., 33.
[17] Adam Kleinman, "Intra-actions" (interview with Karen Barad), *Mousse*, No. 34, 2012, 77.

these differences are stabilized and destabilized, as well as their materializing effects and constitutive exclusions.[18]

Barad's onto-ethico-epistemological contributions, as well as the shift of the analytical lens towards relations located in the material domain, indicate, as Majbroda claims,

> the need for an anthropological rethinking of the concept of humanity as such, as well as for a redefinition of the concept of 'world', the scope of which exceeds the traditional understanding of society. Human beings interact not only at the level of the social order, but also at the level of the natural order; only these two spaces allow for the emergence of a subject capable of acting in constant interaction with the external environment.[19]

This reflection also found its ground in the exploration of what the materiality of sound is and how it manifests itself. When analyzing sound from the perspective of the new materialist paradigm, it seems reasonable to focus on the notion of vibration, that is, the physical, material process of producing sonic phenomena. Michele Friedner and Stefan Helmreich define the materiality of sound as "a vibration of a certain frequency in a material term",[20] rather than as a sensation that arises only when the vibration is produced within the auditory sense. Cristoph Cox has also noted the inadequacy of discursive and textual theories to describe sound phenomena, which center around the issue of its materialization. Moreover, he notes that these perspectives highlight the separation between culture (the domain of sense-making, meaning and representation) and nature (the domain of inert and *dumb matter*[21]). Nature in such a model is either dismissed as irrelevant or considered a cultural projection or social construction, thus emphasizing the anthropocentric point of view. Textuality and discursivity treats human symbolic interaction as an unique and privileged gift from which the rest of nature is excluded, situating humans above the world around them.

However, Cox notes that the very structure of sound is incompatible with the way it is described in terms of constructivist representations. Thus, he compares acoustic stimuli to visual ones, noting that "written texts and

[18] Ibid., 77.

[19] Katarzyna Majbroda, "Zredefiniować rzecz: antropologia kulturowa wobec zwrotu ku materialności", T*ematy z Szewskiej*, Vol. 17, No. 1, 2016, 9.

[20] Michele Friedner, Stefan Helmreich, "Sound Studies 'Meets Deaf Studies'", *The Senses and Society*, Vol. 7, No.1, 2012.

[21] Cristoph Cox, "Beyond Representation and Signification: Toward a Sonic Materialism", *Journal of Visual Culture*, Vol. 10, No. 2, 2011, 147.

images require the distance of vision that separates subject from object. By contrast, sound is immersive and proximal, surrounding and passing through the body. And while texts and images involve the spatial juxtaposition of elements, the sonic arts involve a temporal flux in which elements interpenetrate one another".[22]

This is emphasized, for instance, by the manifestations of 20th and 21st century sound art that goes beyond the structure of musical notation and focuses on the material and energetic properties of sound, for example the activity of such artists as Christina Kubisch, Alvin Lucier, Francisco Lopez, and Max Neuhaus. According to Cox, the works of the aforementioned artists reveal that sound art is not at all more abstract than visual art, but more concrete, and that it requires a *materialis*t rather than a *formalist* analysis.[23] Luc Döbereiner also speaks in relation to Cox's article (supplementing the argument with the relational aspect of sound's functioning in the area of its materiality), who, like Barad, believes that matter is neither a pre-existing nor a purely subjective fantasy, but the objective result of a material-discursive system. He understands compositional models or systems of sound synthesis as cognitive tools (Barad's performative apparatus) that mark the boundary between subject and object, which are both the result of the operation of this boundary. For this reason, Döbereiner encourages to understand compositional practice not as an anthropocentric activity based on imaginary discursive frameworks that give access to the actual creative material forces of sound-in-itself, but as a practice of materially (re)configuring the world.[24]

In the next section, I will show, using Björk's *Biophilia* project as an example, how the materialization of sound and music occurs, and how the artist combines science and music theory in a transdisciplinary weave, drawing attention to the human-non-human causality that emerges within the assemblage of the album-application.

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[22] Ibid., 148.

[23] Ibid., 148–149.

[24] Luc Döbereiner, "How to Think Sound in Itself? Towards a Materialist Dialectic of Sound", Proceedings of the Electroacoustic Music Studies NetworkConference Electroacoustic Music Beyond Performance, Berlin, 2014, viewed at 24 February 2022, http://www.ems-network.org/IMG/pdf_EMS14_doebereiner.pdf.

Mattering of the Meaning in Björk's *Biophilia*

Biophilia is a multidimensional musical project that was released as an album-application in 2011. The term biophilia itself denotes the tendency "to participate in natural processes and systems, and especially to live in a living environment (...). The term biophilia, as a scientific concept, was first used by Erich Fromm[25] to describe the psychological orientation of being attracted to everything living and relevant".[26] *Biophilia* addressed the theme of the interdependence and interaction of humans with their environment, it raised questions about the relationship of human and non-human entities, and sought the relationships that lie between actual chemical and physical phenomena and musical, sonic matter. The project was developed by the Icelandic artist, Björk Guðmundsdóttir, with a multi-person team responsible for creating its individual elements. It consisted of musicians, builders of musical instruments specially designed for the occasion, creative programmers developing the accompanying application, academics and teaching staff responsible for the substantive content of the project and developing the didactic part of the *Biophilia Educational Project* undertaking (this transdisciplinary team called the Nordic Team included composer Sunlief Rasmussen, astrophysicist Anja Andersen, playwright and director Pipaluk Jörgensen, doctor of philosophy in music education Cecilia Björck, professor of astronomy Esko Valtaoja, professor of science education Alex Strömme, chairman of the board of the Teaching Centre of the University of Iceland Guðrún Geirsdóttir, and Björk herself).[27]

The thematic axis of *Biophilia* is rethinking the non-human environment, the relationship between human, nature and the technology that mediates it. The aim of the project was also to investigate the origin of music and the specificity of its structure, taking as a starting point the phenomena occurring in nature. In the documentary made for *Channel 4*, which promoted *Biophilia*, it was said in the introduction that the project was created "to change the way we see, hear, think about and make music".[28] Björk thus de-

[25] Erich Fromm, *The Anatomy of Human Destructiveness*, New York, Holt, 1973.

[26] Bogusz Modrzewski, Anna Szkołut, "Biofilia – teoria i praktyka projektowa", in: F. Górski, M. Łaskarzewska-Średzińska (Eds), *BIOCITY*, Warszawa, Wydział Architektury Politechniki Warszawskiej, 2015, 181.

[27] *Biophilia* Educational Project, viewed 24 February 2022, https://biophiliaeducational.org.

[28] Louise Hooper, *When Björk Met Attenborough*, 2013, Youtube, from 00:00:20, viewed

cides to delve into what we understand as nature, in search of a rudimentary musical connection between all its creations.[29] The project is thus a transdisciplinary attempt to produce a new, multithreaded kind of knowledge about music, in which scientific and cultural contexts intertwine and overlap in a hybrid discourse. *Biophilia* thus realizes the new materialist postulate, in which one of the most important issues is the abolition of the binary division between culture and nature.

Working on *Biophilia* was also interlinked with the introduction of the first model of the Apple iPad tablet on the market (April 2010). During the work on the album, the device was considered both as an album-application medium and as a musical instrument used during performances. The Icelandic artist, observing the agencies emerging between human, technology and the environment, wanted to create an interface that would bring the viewer closer to the issue of biophilia. By creating an interactive app in which each piece relied on a different kind of interaction with the user, Björk wanted to take a multifaceted look at the issue of the mutual correlation between the human and the non-human. The app was released in sync with a physical and digital "standard" album. The program consisted of a "mother app" (called "box" by the creators[30]), which itself acted as an interactive visualization of the *Cosmogony* track on the album.[31] This application was also the interface where users could access further specially designed, unique applications assigned to nine consecutive songs. Each song had its own application, resembling an interactive audiovisual game that was a didactic carrier of developed connections between natural phenomena and issues derived from music theory and musicology. The assemblage created by *Biophilia* consisted of many elements and interrelationships – both in the compositional layer, the performance layer, and the layer which is closely related to the interaction of the application's user. Each consecutive track was assigned a different environmental phenomenon and a different musical concept or term: *Thunder-*

24 February 2022, https://www.youtube.com/watch?v=c_jVvTW8Oco&ab_channel=Mr.G.

[29] Marek Susdorf, "Björk's Biophilia. A Musical Introduction to Feminist New Materialism", *Junctions*, Vol. 2, No. 2, 2017, 114.

[30] Nicola Dibben, "Visualizing the App Album with Björk's Biophilia", in: C. Vernallis, A. Herzog, J. Richardson (Eds), *The Oxford Handbook of Sound and Image in Digital Media*, Oxford–New York, Oxford Univeristy Press, 2013, 683.

[31] Björk, *Björk: biophilia: cosmogony app tutorial*, Youtube, 2012, viewed 24 February 2022, https://www.youtube.com/watch?v=3dlRg6lM4mQ.

bolt: lightning – arpeggios; *Moon*: moon phases – musical sequencers; *Crystalline*: crystal structure – structure and spatial musical environments; *Hollow*: DNA – rhythm and speed; *Dark Matter*: dark matter – musical scales; *Mutual Core*: tectonic plates – chords; *Solstice*: Earth's tilt and gravity – counterpoint; *Sacrifice*: interaction of the sexes – musical notation; *Cosmogony*: music of the spheres – state of equilibrium; *Virus*: viruses – generative music.[32]

Initially, Björk envisioned *Biophilia* differently – looking for a different way to present the issues addressed by the songs, the Icelandic artist wanted to build a special musical house that would function as a *Biophilia* museum, with each room designed for a particular song and containing interactive exhibitions related to them.[33] Ultimately, Björk was most concerned with providing an experience that was strongly integrated with physicality and tactility. The relationship between sound and visuality, relating directly to musical structures and processes was to be affectively mediated. Björk's idea was to use touch screens as an intuitive tool for music making and as a means for interactive, educational experiences that would allow the user to explore an aspect of musical structure through the phenomena of the physical world. According to the app's lead developer, interactive artist Scott Snibbe, the song apps are "not merely a music video, and also not just some kind of pure musicological analysis, but they're actually a new creative experience that uses music, nature, technology and interactivity".[34] In addition to providing an interactive way of exploring the content of the songs, each of the apps enabled both traditional and linear listening and viewing of the songs, as well as the creation of customized versions of the songs. The apps thus had the markings of an experimental and generative musical practice that enabled personalized cognition of particular musical principals. Songs on the app did not exist as fixed versions: the app allowed users, for example, to improvise a bass line

[32] WIRED UK, *Bjork: On Music and Biophilia – The Sound of Nature | WIRED 2013 | WIRED,* Youtube, 2013, viewed 24 February 2022, https://www.youtube.com/watch?v=UTcy5c73ZZY.

[33] Charlie Burton, *In depth: How Björk's 'Biophilia' album fuses music with iPad apps*, 2011, viewed 24 February 2022, https://www.wired.co.uk/article/music-nature-science?page=all.

[34] Jason Lipschutz, *Bjork's App Designer Scott Snibbe Talks In-Depth About 'Biophilia.'*, 2011, viewed 24 February 2022, https://web.archive.org/web/20110926185904/http://www.billboard.biz/bbbiz/industry/digital-and-mobile/bjork-s-app-designer-scott-snibbe-talks-1005293722.

(*Thunderbolt*), create a path through the structure of a song (*Crystalline*), delay the progression of a song (*Virus*), compose musical sequences (*Moon, Solstice, Hollow, Dark Matter*) and record musical notation (*Sacrifice*). This meant that the listener could personalize their experience and the album could be listened to in different versions.[35]

Scott Snibbe also notes that when designing the application, he was most concerned with its openness, which would allow for any kind of investigation into how the application works and how the sound is shaped. The programmer specifically did not create a scripted application that relies on the sequential activation of successive buttons in order for the *Biophilia* experience to reconfigure itself each time and be different from the previous one.[36]

The *Biophilia* application can be compared in this context to the apparatus described by Barad – it changes depending on its potential user. It reveals reconfigurations of the connections between technology, science and music differently each time, as it remains open to the changing ways of accessing information. Moreover, it takes an active part in the production and constitution of knowledge. It is not fixed like a musical score or any other kind of musical script. Nicola Dibben furthermore points out the processual nature of Björk's songs. The songs are not a constant, single object, but "remade in different performances according to available resources: not only are the versions of songs on the app suite and music album different, the versions on the song app, score, and animation also differ. Other features also allow interactivity and user-generated content".[37] Their matter is thus performative, only revealed when the subject comes into contact with the object and undergoes its constant transformation.

The digital, interactive format of the touch screen device is also central to the project through the way it makes the creation and learning of electronic music a more embodied process based on somatic experience.[38] Björk thus opposed textual and constructivist approaches to music; she wanted to make music education a more embodied experience. She wanted to go be-

[35] Nicola Dibben, "Visualizing the App Album…", op. cit., 693.

[36] Julia Kaganskiy, *Interactive Artist Scott Snibbe Gives Us The Scoop On Björk's Biophilia Apps,* 2012, viewed 24 February 2022, https://web.archive.org/web/20140817213211/http://thecreatorsproject.vice.com/blog/interactive-artist-scott-snibbe-gives-us-the-scoop-on-björks-ibiophiliai-apps.

[37] Nicola Dibben, "Visualizing the App Album…", op. cit., 693.

[38] AlmaDís Kristinsdóttir, "Infectious Virus: Biophilia and Sustainable Museum Education Practices", *Museum and Society*, Vol. 16, No. 3, 2018, 399.

yond the abstract theorization of musical processes. It was also her intention to make the world of music equally accessible to anyone by including people who do not need to have special musical training or education to learn about it. The app was also meant to be an educational tool, which Björk said would replace notation and book theory with instinct and creativity.[39]

Additionally, Björk wanted to show with her project that musicology is connected to existing forms in nature and the environment and to reveal its spatial and physical aspects.[40] In doing so, hers is reminiscent of Karen Barad's approach – the Icelandic artist starts from constructing a theory (in this case a musical theory) through the very materialization of the sound world. Björk's approach is also rooted in a critique of the model of music education that she attended, which was based on an overly intensified training of a rigidly defined and reproductive repertoire of classical and romantic Western European music.[41]

For the Icelandic artist, materializing the world meant opening up to non-human agencies and establishing a post-human kind of community with them, going beyond the anthropocentric perspective. As Marek Susdorf observes, Björk "does not fall prey to the patriarchal presentation of 'nature' as an ultrapositive, romanticised, woman-like figure, overgrown with myths of fertility. On the contrary, she tries to become a scientist but of a special kind. (...) the singer starts to listen to the world that surrounds her, rather than to observe and to discursively colonise it".[42] Björk allows matter to materialize on its own, thus becoming a recipient of the ways in which it reveals itself.

A similar openness to acoustic phenomena can be found in Douglas Kahn's description of an alternative discovery of natural radio made by Thomas Watson (Alexander Graham Bell's assistant during his work on the invention of the telephone).[43] Kahn, through the analysis of electromagnetic interactions, creates a new way of understanding the sound relation between human and nature, as well as the role of telecommunication technologies (especially those processing acoustic signals) in the production of this relation. As Kahn recalls:

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[39] Ryan Dombal, *Björk* (interview), 2011, viewed 24 February 2022, https://pitchfork.com/features/interview/7996-bjork/.

[40] Ibid.

[41] Ibid.

[42] Marek Susdorf, "Björk's Biophilia ", op. cit., 114.

[43] Douglas Kahn, *Earth Sound Earth Signal…*, op. cit., 25–40.

> Watson heard natural radio when the long iron telephone test line acted unwittingly as a long-wave antenna. This was before anyone knew what an antenna was or, for that matter, what electromagnetic radio waves were. (…) Environmental energies had long been ever-present in the telegraph system, but the transductive capability of the telephone made them audible as never before.[44]

Björk seeks musical answers through the perception of material flows of forces and energy – together with non-human actants they become jointly in need of mutual understanding.[45] The materialization of the world through sound has not only manifested itself in the embodied experience of application, but also in the search for new instrumentation used to perform the works. This is exemplified in Björk's work on the creation of *Solstice*, in which she explains musical interval and counterpoint by starting from the physical gravitational pull. An instrument called the *gravity harp* was built specifically for the piece in collaboration with MIT engineer Andy Cavatorta.[46] The instrument consisted of a system of pendulums on which 11 strings were strung, plucked by a plectron as it passed through the center of its path.[47] The contrapuntal accompaniment line created by the pendulums could be controlled via a touch screen tablet. The aural experience, the melodies created, were thus determined by the speed of the moving pendulums, their weight, and the temporal relationships between each arm deviation. Björk thus gives the possibility to non-human energy to reveal itself and materialize in the form of different sound courses.

The Icelandic artist intentionally did not want to use only electronic instruments, despite the *Biophilia* high level of technological mediation. As she mentions in the interview, she was interested in the meeting of the digitally generated sound with the acoustic one, in order to create a common meeting of these two spheres and create a closer relationship between the digital interactive production (using a tablet) of sound from an acoustic instrument.[48] In

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[44] Ibid., 13–14, 27.

[45] Marek Susdorf, "Björk's Biophilia ", op. cit., 115.

[46] VernissageTV, *Björk / Andy Cavatorta Gravity Harps at MoMA, NYC*, 2015, Youtube, viewed 24 February 2022, https://www.youtube.com/watch?v=Di99Y6OdnpY&ab_channel=VernissageTV.

[47] Abdullah Saeed, *A Guide To Björk's Custom Biophilia Instrument*, 2012, viewed 24 February 2022, https://web.archive.org/web/20130912050716/http://thecreatorsproject.vice.com/blog/a-guide-to-björks-custom-ibiophiliai-instruments.

[48] Ryan Dombal, *Björk* (interview), 2011, viewed 24 February 2022, https://pitchfork.com/features/interview/7996-bjork/.

this way, she wanted to blur the distinction and distance between sound generated in the electromagnetic domain and sound generated by "natural" methods.

At this point, I will refer again to Douglas Kahn. The researcher points to the distinction between types of transduction introduced by the discovery of sounds of a electromagnetic nature – *transduction in-degree* and *transduction in-kind*.[49] The first type refers to the sounds remaining in the domain of the transformation of the homogeneous type of energy (classical mechanics), e.g. wind movement is transformed through an object (an acoustic instrument, a crack between rocks) into a sound of a certain pitch. The second type describes sounds created by the transduction of energy between two different states: mechanical – electromagnetic. This dichotomy emphasized the historically widespread division between sounds derived from nature (*in-degree*) and those having nothing to do with nature, technological (*in-kind*) causing a separation of the two areas. Kahn gives yet more proof for the unfoundedness of this oppositional way of thinking about sound, finding it in the very process of listening[50] in which both types of transduction occur and giving the example of the previously mentioned natural radio – in other words the example of a sound produced naturally by the interaction of electromagnetic energies.

The direct use of electromagnetic matter is manifested in Björk's *Thunderbolt* piece, where she used a combination of a Tesla coil with enclosed lightning and a special kind of plasma loudspeaker, in which the traditional function of the membrane is performed by an electric arc. Thanks to this combination, she generated a bass line accompanying her voice. With this, the Icelandic artist wanted to manifest a perspective that decentralizes the human subject and strike at the anthropocentrically grounded uniqueness of the human species. She thus adopted a perspective advocated by, for example, Donna Haraway, who maintains that humans have always been intertwined

[49] Douglas Kahn, *Earth Sound Earth Signal…*, op. cit., 55–57.

[50] The process of listening also involves both transdution *in-degree* – moving the eardrum and transmitting vibrations through the auditory ossicles – and transduction *in-kind* – the stimulation of electrochemical signals by the inner ciliary cells. In addition, Kahn points out that in-kind transduction also takes place in the form of a nervous system response to incoming sound sent back to the vibrating cells of the inner ear. Thus, this process is nothing more than an active response of the ear to an acoustic stimulus. This perspective changes the human position in relation to the surrounding auditory phenomena, in relation to which they cease to be merely passive receptors.

with organic or inorganic manifestations of matter: "no species, not even our own arrogant one pretending to be good individuals in so-called modern Western scripts, acts alone; assemblages of organic species and of abiotic actors make history, the evolutionary kind and the other kinds too".[51]

In this context, there is a significant moment in Hopper's documentary, in which Björk practices her vocal part for the song *Sacrifice* while synchronizing herself to a huge *sharpsicord*[52] specifically designed by Henry Dagg – a crossover between a barrel organ and a harp, the sequence of which is programmed manually by inserting pins into a huge cylinder with 11500 holes on its surface.[53] Setting up the sound sequence was very time-consuming (it takes an entire day of programming to establish one minute of sound progression). Björk singing along with the instrument therefore had to adapt to it, to harmonize herself in the face of the non-human force of the progressing sequence.[54] The act is therefore another manifestation of opening up to the non-human world – Björk thus urges us to start listening to the world around us, while emphasizing the need to avoid making authoritative statements about it.

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51 Donna Haraway, "Anthropocene, Capitalocene, Plantationocene, Chtulucene: Making Kin", *Environmental Humanities*, Vol. 6, No. 1, 2015, 159.

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54 Ibid., from 00:14:00.

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Summary

In this paper I have attempted to show how Björk's transdisciplinary *Biophilia* project can be approached from the perspective of the new-materialist paradigm represented by Karen Barad. The Icelandic artist presents how a human kind of musical composing can originate from areas of non-human agency. Like the author of agential realism, the Icelandic artist does not fall into the trap of metaphorizing concepts taken out of physical theories, but instead looks for their material properties, which then causally construct the discourse and generate reconfigurations of already existing theories and musical structures.

There are, however, visible voices critical of Björk's work. Nicola Dibben notes that the structure of the application treats successive elements of music theory in an isolated manner. By assigning each topic a distinct piece, a separate sub-application, it isolates musical elements such as scales, meter, harmony and tempo, thus emphasizing the conservative and traditional approach to teaching music[55] and natural phenomena from the continuum of the material becoming-world. Furthermore, as AlmaDís Kristinsdóttir mentions, the *Biophilia* content that was the basis of the educational project taking place after Björk's tour, despite its openness and unique didactic methodology, could only be taught by *Biophilia* team-trained, "approved" teachers. This resulted in the limited and exclusive nature of *Biophilia's* educational dimension, difficult to implement in informal, non-institutional educational settings.

[55] Nicola Dibben, "Visualizing the App Album…", op. cit., 689.

New materialism effectively complements the analysis of *Biophilia*, especially in terms of observing the intra-actions between human and non-human elements revealing sound matter and reconfiguring its meaning. It also provides a functional method for analyzing endeavors that elude traditional binary disciplinary divisions, combining art, science, and technology exploring the environmental connections and relationships in which humans are involved and entangled.

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THE NON-EXISTENT PAST OF THE DISTANT FUTURE

About the Composition *Post-Excavation Activities* by Svetlana Maraš

Abstract: The text interprets Svetlana Maraš's electroacoustic radiophonic composition *Post-Excavation Activities* (2020). The compositional principle, which the author calls *the inversion of concrete music*, and which includes work with sounds of digital origin whose purpose is *to resemble* found sound artifacts, has been compared with the imaginary archives. Following the intention of Svetlana Maraš to present the medium as a sounding compositional layer, an analysis was made of which sound objects in this work can be representationally determined and how they participate in the communicativeness of the work of music. The importance of radio as a medium was emphasized, but also the context of the Electronic Studio of Radio Belgrade in which the materials for the composition were created.
Keywords: Svetlana Maraš, *Post-Excavation Activities*, experimental radiophonics, electroacoustic music, radio, sound objects, imaginary archive

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Radiophonic work by Svetlana Maraš,[1] *Post-Excavation Activities*, was first broadcast on 30th May 2020 on the Third Program of Radio Belgrade. The composition, as the author writes in the program note, "is based on a fictional scenario of restoring the ancient, lost and found, musical recordings." The title refers to analytical methods and techniques that take place after the archeological fieldwork. The lengthy and complex sequence of procedures (from careful cleaning and conservation of more fragile artifacts, sorting and classifying samples, and complex methods of dating... to numerous other specialized techniques) brings a more complete and deeper understanding of the historical and cultural significance of the found artifacts.[2]

The process of the collection and editing of sound materials was also lengthy. The composition was written from June 2019 to April 2020, and some materials used in it were gathered even earlier, from February 2019.[3] When describing her compositional process, Svetlana Maraš mentions a personal informal and somewhat disorganized base of sound materials that is being refreshed during work on each new project.[4] The author transfers mate-

[1] Svetlana Maraš (1985), composer and sound artist, has long been active on both the local and international scenes of experimental music. She studied composition in Belgrade in the class of Professor Zoran Erić, won her master's degree at the Department of Media of the School of Arts, Design, and Architecture at Aalto University in Finland, and specialized in several courses and workshops in Austria, Germany, and the USA. Svetlana Maraš's work covers the field of new music and sound art and ranges from performances through interactive installations to electroacoustic compositions and other sound art forms. Maraš presented her works at the Gantner Multimedia Center (Bourogne), the Onassis Cultural Center (Athens), the Museum of Contemporary Art (Belgrade), the Huddersfield Festival of Contemporary Music, the Contemporary Sound Showcase in Zagreb, the CTM Festival in Berlin ... Among important compositions by Svetlana Maraš are her electroacoustic and radio works *Poetica Micro Mix* (2011), *Canzone Distorte* (2013), *Language* (2016), *Radio Concert No. 1* and *Radio Concert No. 2*, *Post-Excavation Activities*, then *It's About Spy Stations* (2009) for voice, guitar, computer keyboard, bass clarinet, objects and live electronics, *Dirty Thoughts* (2015) for ensemble and live electronics, *Chamber Music* for accordion with electronics and cello (2020) (biographical data downloaded from http://www.serbiancomposers.org/kompozitori/svetlanamaras/) accessed on 27 April 2022).

[2] https://en.wikipedia.org/wiki/Post-excavation_analysis (accessed on 14 April 2022).

[3] From the author's Program Note on the composition, available on the author's profile on the online music platform Bandcamp, where the composition in its integral version can be found: https://svetlanamaras.bandcamp.com/album/post-excavation-activities (accessed on 14 April 2022).

[4] According to *An online conversation* between A. Gnjatović and S. Maraš on Zoom platform (25 March 2022).

rials, usually *small sounds*, the clearly defined short sound objects[5] from one composition to another, and recontextualizes them. In the case of Post-excavation activities, the author insists that the majority of the sounds used in the piece "have a purely digital origin although their purpose is to resemble the quality and the characteristics of field recordings, amplified objects, or other concrete sounds. In this instance, the compositional method becomes an inversion of the concrete music in an attempt to re-create the world of real, organic sounds by using the artificial, digital ones."[6] If the comparison of Svetlana Maraš's work with archeological work were to be continued at this point, the procedures would suit those dealing with pseudo-archeology, negatively connoted, a discipline that interprets the past by rejecting scientific methods and distorting findings under the desired narrative. The procedures of fabrication and tendentious contextualization of artifacts, however, point to specific artistic concepts and structures – the imaginary archives.[7]

In his essay *An archival impulse*,[8] Hal Foster defines the art of archives as a genre that seeks "to make historical information, often lost or displaced, physically present", which corresponds to the original description of Post-excavation activities. Whether the relationship towards the artefacts as material happens in projects that use actual archival material or the archive serves the artist only as a conceptual tool, the idea of archiving remains attractive in contemporary art. The attitude toward the construction of an archive as a performative practice, of tensions of the ephemeral and permanent, emerging and preserved, gradually transforms the archive from a repository of art documents to an artistic medium. The imaginary archive artists create *from zero* by creating not only the construction, function, and narrative of the archive but every single document that should take place inside it. The constructed documents/art objects are not a goal in themselves and do not necessarily bear the contextual marking but are fabricated as raw material that

[5] The composition *Post-Eexcavation Activities* was awarded the "Stevan Mokranjac" Award for 2020, about which more will be said later in the text. As stated in the Explanation of the Jury Award Decision, Svetlana Maraš's compositional procedure "has so far always been based on the use of sounds of short and definite duration, which are clearly defined, with great gestural potential and strong physical presence." The text of the Explanation is available from: https://composers.rs/wp-content/uploads/2011/07/Mokranjceva-nagrada-obrazlozenje-S.Maras_.pdf (accessed on 23 April 2022).

[6] Svetlana Maraš, *Program note*

[7] The terms *fictional archive* and *experimental archive* are less frequently used.

[8] Hal Foster, "An Archival Impulse", *October*, Vol. 110, 2004, 3–22.

obtains its identity in the language and structure of the archive that produces them.

What the archive of the imaginary provides versus the archive of the real, historical, is the possibility of imagining (lying, creation), which is contained in its very essence. The fact that artistic expression is not predicated upon factuality allows it to be physically realized through any means and ways/acts that seem appropriate to the artist. Through the narrative frame of the archive, the artist speaks the meaning of the archival material and interprets it as if it had been uncovered, while that same material actually emerges as an artistic interpretation of the narrative that the artist communicates. "The composition was created by a very tranquil fitting of the material, over a year or more, and I mean the fitting of larger sections that gave the composition a narrative character. The fictional script of the work arose to some extent from the sound characteristics of the original material (...)."[9] In the last third of the research process,[10] a reciprocal cyclical game of materials that feeds the concept that gives birth to materials has emerged.

Svetlana Maraš builds a narrative of her work as "a personal contemplation of what this imaginary sound reproduction technology might be, and moreover, what are the musical specificities of a medium that we consider to be old (and maybe even long forgotten) in general. These imaginary (musical) findings are the central idea around which the compositions have been made. The sound vocabulary of the work has been built elaborating on this and on the idea that the medium, as a physical fact, can be represented in music as one of many existing compositional layers, with a possibility to be depicted by using conventional musical tools."[11]

The author connects her work with the legacy of early concrete music, the historical practice of compositional work "with sounds that specifically exist and can be considered complete and defined sound objects."[12] The re-

[9] The excerpt was taken from an interview with Svetlana Maraš conducted by musicologist Milan Milojković, Ph.D. *Razgovor s povodom*, web page of Composers' Association of Serbia: https://composers.rs/?p=7583 (accessed on 27 April 2022).

[10] *An online conversation* (25 March 2022)

[11] Svetlana Maraš, *Program note*

[12] The very term *sound objects* (les objets sonores) was first used by Pierre Schaeffer, the founder of the genre of musique concrète, when describing sound materials, i.e., specific and unique sound segments that are isolated from the original context by a compositional-technological process (recording) and treated as found objects, "fragments of sound that specifically exist. Then, through further manipulation, transformation, and musical

search on the manifestation and characteristics of sound objects is present and significant in the compositional as well as the theoretical practice of Svetlana Maraš. In her master thesis *Embodied Composition. Treatment and meaning of physical object in experimental music and sound art*,[13] she examines the relation of Western European and North American art music to non-musical objects, the embodiment of music, and the problems of autonomy of non-musical objects in a musical work. Until she reaches her method of *inversion of concrete music* in *Post-Excavation Activities*, she crosses the circular path from the sound relation and musical relation to the physical object to the gradual release of sound from its material source. Objects continue to survive only through their auditory dimension, artificially generated, inorganic, but musically shaped and contextually positioned so as to carry within them a representation, a shadow of some material body occupying some physical space.

The composition consists of ten short movements (the shortest of them lasts only 61 seconds, and the longest is 6 minutes and 29 seconds). The total duration is 29 minutes and 25 seconds. "Some titles of the individual pieces point to concrete references, providing the listener with the material for a storytelling experience that permeates the whole work."[14] Movements in the composition can, to some extent, be classified based on the *main, most evocative* sound objects they contain and according to the principles of the organization of the course of music. There is, however, no movement in the piece in which only one sound source is present, nor in which one sole constructive procedure is in force. Thus, the tape does not sound only through the movements whose names directly refer to it (*Tape 1*, *Tape 2*) but is present throughout the composition, as a sound artefact or as a reference to a characteristic of the medium, for example, through the increased compression of the sound spectrum.

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recontextualization, sound objects become musical objects." According to: Biljana Srećković, *Modernistički projekat Pjera Šefera: Od ispitivanja radiofonije do muzičkih istraživanja*, Beograd, Fakultet muzičke umetnosti, 2011, 45–50.

[13] The theoretical study *Embodied Composition. Treatment and meaning of physical object in experimental music and sound art*, is part of the master's thesis defended in 2008 at the Media Department of the School of Art and Design, Aalto University, Espoo, Finland.

[14] Svetlana Maraš, *Program note*

Movement	Length	Predominant sound object	Organization of the form
1 – Opening	03:44	EMS Synthi 100	music[1] (tonal, with reptetitions)
2 – Voice recording (re-construction)	01:14	voice	music (tonal, with repetitions)
3 – Tape fragment 1	01:15	magnetic tape	sound (concrete sound)
4 – Episode 1	03:02	EMS Synthi 100	music
5 – Main	06:29	voice	music + sound
6 – Episode 2	01:01	EMS Synthi 100	music (tonal, with repetitons)
7 – Incomplete	06:01	voice	concrete
8 – Noise	01:58	EMS Synthi 100	music + sound
9 – Tape fragment 2	02:56	magnetic tape	sound (concrete sounds)
10 – Episode 3 (Ending)	01:45	EMS Synthi 100	music (tonal, with repetitions)

Even without delving into the complexity and discordance of theoretical views of different authors on the representational capacity and character of music as art, it is clear that in the case of *Post-Excavation Activities*, working with sound objects and artefacts is more a game of invocation than of representation. What are the parts of the material world of sound that the author evokes? How many artefacts are, in fact, recognizable in the sound and cause in the listener at least partially distinct associations with the source of the sound, its origin, and physical manifestation? In the multitude of small sounds that build the eco-system of the work, there are three types of sounds whose aspects (to an unequal extent and often in odd relationships) can be representationally determined:

1) sounds EMS Synthi 100
2) the sounds of a magnetic tape
3) human voices

[15] Biljana Leković, in her *Ontological 'Key' for problematizing sound art*, separates performative sound art – the practice of performing sound as a temporal art without communication with material space (which would correspond to the musical organization of the form from the table above) and presentational sound art – the practice of treating the sound as art in time and in communication with the physical space of the sound setting (to which the sound organization of the form would correspond). Along with these two categories, their amalgam, performative-presentational art, is also present. According to: Biljana Leković, *Sound Art/Zvukovna umetnost: Muzikološka perspektiva – teorije*, Beograd, Fakultet muzičke umetnosti, Katedra za muzikologiju, 2019, 105–106.

1) "The signature sound by EMS Synthi 100 has been used cohesively throughout the different sections of the composition to set an emotional backdrop of the work..."[16] During the engagement of Svetlana Maraš in the Electronic Studio of Radio Belgrade, the analog/digital hybrid synthesizer EMS Synthi 100 was restored and put into active use,[17] originally assembled and adapted for the needs of Belgrade Radio in 1971.[18] This rare and complex device with a specific sound has become a hub in the work of the renovated studio, which became a "place of active research and production of electronic music"[19] through workshops, composers' residences, guest appearances, and concerts by foreign and domestic artists. The composer's continuous work with the electronic instrument, next to serving as a source of sound materials, resulted, among other things, in her pieces *Radio Concert No. 1* and *Radio Concert No. 2*, in which "the use of EMS Synthi 100 (*Synthi*) in combination with computer setup and magnetic tape loops"[20] depicts a sonic landscape akin to the world of *Post-Excavation Activities*.

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16 Svetlana Maraš, *Program note*

17 Svetlana Maraš was the composer in residence and artistic director of the Electronic Studio of Radio Belgrade from 2016 to September 2021, when she took over the position of professor of creative music technologies and co-head of Electronic Studio of the Academy of Music of the University of Applied Sciences and Arts (FHNW) in Basel. The joint efforts of the editorial staff of the Third Program of Radio Belgrade in this period resulted in the revitalization and modernization of the studio through the reparation of the EMS Synthi 100 and Studer track recorder and the purchase of other specialized equipment. After more than a decade of inactivity, the official concert opening of the renovated Studio took place in March 2018. The concert, starring Synthi 100, featured live compositions by Svetlana Maraš and Paul Pignon, an improvisation by Nicola Ratti, and a screening of Slobodan Šijan's experimental film *Yeah* (1972), for which the music was composed by Paul Pignon.

18 https://en.wikipedia.org/wiki/EMS_Synthi_100 (accessed on 27 April 2022).

19 Milan Milojković, *Razgovor s povodom*

20 "In Radio Concert No. 2, the expressiveness of complex micro-processes is applied, enabled by computer technology in the analog domain. Svetlana Maraš characterizes her approach to sound in the last few compositions as an inversion of concrete music. Namely, resemblance to the concrete sound is achieved through the application of processes inspired mainly by granular synthesis and micro-compositional techniques based on the sound source, whether analog or digital. Sonoristically and at the level of aesthetic direction, this work consciously and actively communicates with the sound of the past and early electronic music." From the announcement of the show Electronic Studio (RB3) dedicated to Svetlana Maraš's Radio Concert No. 2: https://www.rts.rs/page/radio/ci/story/1464/radio-beograd-3/4422043/elektronski-studio--svetlana-maras-radijski-koncert-broj-2.html (accessed on 27 April 2022).

The sound of Synthi, as connective and emotional tissue, symbolically positions the author's creative practice in relation to the heritage of the Belgrade Electronic Studio. It opens the *Post-Excavation Activities* and is present as the supporting sound layer in all *episodes*, as well as in the eighth movement (*Noise*). Thus, as many as five of the ten movements of the composition, including its *Opening* and *Ending*, speak in the language of Synthi. At the same time, these are the most melodic movements of the composition (although the melodic component traditionally understood as the activity of the relationships of tones of different pitches has no significant connotations in this piece).

All episodes are characterized by repetitiveness – slightly distorted or irregular looping. Synthi does not give much scope for the temporal organization of the course, so one of the ways to build a longer musical phrase from the configured fragment is to repeat it through the work of an envelope shaper.[21] This dynamic processor (similar to a compressor but not affecting the original signal level) allows independent boosting or the attenuating of different sound envelope segments. The sonification of the technical characteristics and limitations of the medium itself, testifies that in the service of the representational aspect of sound in this case are not only Synthi's sounds, but also its devices and processes. Repetitiveness, from the very beginning, acts as a ritual. It contributes to the immersiveness of the work, drawing the listener into the rhythm and cycle of distant and deep layers of existence.

Opening draws a not-quite-periodic loop of the EMS Synthi 100 figure dominated by a long tone ***g4***. This main layer is gradually joined by artefacts of unclear origin, which, with their considerably larger reverberation, progressively build the background layer, which is less informative. As the movement proceeds, the space gradually expands and deepens, the echo of small objects resonates deeper and deeper and gradually, symbolically *opens up the past*. In *Episode 1*, Synthi's sound is more distant than at the beginning. The hum of its highly stretched tones (somewhat ominous and somewhat nostalgic at the same time) repeats and reverberates on the same ground with other sound artefacts, building the sound space of the movement. Occasionally, certain artefacts come to the fore, closer to the listener. *Episode 2*, the cycle's most melodious and *tenderest* movement, is the only one in which there is no continuous activity of very short sounds. The sound of the slightly higher Synthi register is accompanied only by the deep sounds of digital waves (or

[21] *An online conversation* (25 March 2022)

winds?) And very high, discreet glass slides. *Episode 3* (*Ending*) appears as an inverted image of the first movement. One ***d*** reluctantly enters a space echoed by artefacts of an unknown past. As the artefacts thin out, the ***d*** gets its high distorted response, the entire sound landscape shifts to a higher register and Synthi remains the last sound heard in the composition.

2) Although the sound of Synthi is recognizable as *the sound of an old synthesizer*, the notion of its specificity to the sounds of other related instruments is accessible to a small number of listeners. On the other hand, the sound of the magnetic tape and artifacts of its use is part of the great auditory culture of the twentieth century. Thus, its representational power is greater, and the historical landmark is the only one that can be drawn with certainty when trying to contemplate the time that the composition reconstructs.

Movements *Tape fragment 1, and 2* are based on concrete sounds of tape winding and warping, clicking of the hub, characteristic rustling and crackling and other artefacts of this medium... In *Tape fragment* 2 this is further combined with sound content recorded on tape and whose significant distortions occur as a result of (sounding) tape manipulations; this combination works like a camera zooming in and out,[22] playing with the space in which the tape sounds and the space which sounds on the tape. This one example shows how imagined listening perspectives change through composition; in this case:

– the sound of the studio, i.e., the sound of physical manipulation of tapes and devices (sound of tape being placed on a tape recorder, hub clicking, other external sounds)
– *the surface* sound of the tape (sound of rustling or crackling and twisting of the tape itself, as opposed to the sound of its contents),
– the sound of synthesizers, the sound of old technology – the *inner sound of the tape* (the sound of what is on the tape), the sound artifacts of distant cultures, voices.

[22] The term cinema for the ear (cinéma pour l'oreille), which the author uses, connects the techniques of creating an acoustic work with film techniques and addresses the interpretation of sound work in the language of film. This name, established by the French-Canadian composer Francis Dhomont, is used for "a genre of electroacoustic music that makes use of concrete (real-world) sounds that are suggestive of programmic elements. The listener is taken on a journey through different soundscapes that conjure up aural images, creating a cinematic experience for the ear." According to Rob Mackay: https://nickcopefilm.com/2013/10/04/cinema-for-the-ear/(accessed on 23 April 2022).

In the montage of the composition, individual sounds/fragments are organically sewn together, and materials of analog and digital origin are bound into unique smooth surfaces. At other intersections, however, minor distortions and skips intentionally occur; their uneven binding seems like a result of the use of old technology (such as magnetic tape). During the composition movements (especially the longer, more developed ones, such as *Main* or *Unfinished*), changing the point from which the sound is *observed* produces the effect of disorientation of the listener (one sudden, i*mperfect* cut takes place in the fifth movement, at 5:54, when exiting the soundscape and entering into the tape). This is another method the composer deals with, sonifying the medium.

The concretization of sound seems to contribute to the increased abstraction of the organization of the music time. In *Fragments*, rhythmic and rhythmic-formal means (the activity of meter, repetitions, reprises, contrasts, and variations of larger structures) and known ways of organizing a musical texture – do not affect the listener. (This is less striking in *Fragments 1*, in which the number and type of materials used are reduced, and the movement itself is very concise.) The pieces are listened to as works of sound art without the expectations that the passage of music evokes. Interestingly, the movement *Noise*, despite the first impression of the accumulated materials of various origins and contexts (processes and artefacts present in other movements here build the *noise* together), musically communicates somewhat differently. Communicativeness is provided by the emergence of harmonic tonal material (from Synthi) in the 30th second, its transformation/variation, and finally, disappearance.

3) The second movement of the cycle reconstructs the archaic singing of male voices in a complex rhythmic and spatial (panoramic) counterpoint with deep percussive sounds and high noises that occasionally come forward, step into the foreground. Fragmented excerpts of the song, with its phrase contours with rarely perceptible modal scale motion, and a constant rhythmical exchange with percussive sounds, point to an ancient ritual. The anonymity of the voices and singing is achieved by the abrupt cutting and editing of short fragments whose distortions are most significant on slow attacks and torn ends of phrases so that only the vocals are intelligible. At the end of the movement, male voices go into depth, below the range of the human voice, and only based on known phrase contours can the vocal origin of the source be assumed.

The movement *Main* has the most developed dramatic curve and represents a *surrealist sound landscape*[23] in which sounds of obviously digital origin and sounds that act as if they are of biophonic and geophonic origin are found. From 2:12, voices that speak an unrecognizable and non-existent language, a language that, by dissecting morphemes and digital distortions of phonemes, the author alienates from the human, come to the fore. The image intensifies while *the speakers* take multiple positions in the sounding environment. The ominous soundscape moves toward them and grows around them as a threat. From 3:36, the human voice completely disappears, merging with other materials processed so that only distorted outlines of speech can be discerned, and during the next minute, the culminating part of the movement takes place, in which animal-like cries of unidentified origin replace speech. At the end of the piece, only the rustling of the tape remains.

The movement *Incomplete* begins with an inhumanly deep, distorted by stretching, and grainy sound of a choir whose color gradually morphs during extremely slow repetitions of individual tones and turns into a completely indistinct and sporadically interrupted drone.

In addition to the melodic (tonal) character of the episodes entrusted to *Synthi*, the use of voice contributes to the composition's communicativeness. The voice humanizes the deep layers of the past for which the listeners search. Although obvious, this procedure is not banal because, with emotional distancing and anonymization of the voice, the author avoids turning to pathos (*preventing a song, movement 2*) and documentary/didactic (*preventing a story, movement 4*). Another type of emotional distancing from the voice can be observed – whenever it occurs, even in moments when it is questionable whether the voice is human, it is indisputable that the voice is *male*. With the tendency to connect the idea of archaism with the idea of patriarchy, this is also a distancing (perhaps unconscious) from possible (very influential on

[23] English composer Trevor Wishart explains that three interdependent factors are essential for understanding the virtual acoustic space of an electroacoustic work – the sound landscape: the acoustic properties of the perceived sound environment, the disposition of sound objects in it, and the recognition of individual objects. He proposes a division into three types of sound landscapes – real, imaginary and surreal. The surreal sonic landscape is a logically unacceptable ecological whole that contains (recognizable) objects of various origins in impossible relationships. According to: Trevor Wishart, *On Sonic Art*, London, Harwood Academic Publishers, 1998, 139–159.

the perception of auditory experience) analogies to the mother's voice, the primary connection with the vocal in the human mind.[24]

Regardless of the imagined listening perspective, all sounds seem archaic in some way, but their archaeological age is impossible to determine with precision (or at all), so the sound experience is comprehended as *timeless*. In this work, Svetlana Maraš also explores the concept of historicity, which points to the variability of meanings of sound objects and processes in different epochs: "In conceptualizing the work, I turned to the field of archeology because of its broad, meaningful connections with the world of artifacts. In addition, digging deep beneath the surface layers of the earth in anticipation of the discovery of a (sound) object that is symbolically important for its historicity, not just its current functionality, was an interesting starting point."[25]

The friction between the linear time of the context of sound objects and the cyclical time of the temporality of their musical existence is always present in *Post-Excavation Activities*. Linear time, which passes, one-dimensional and one-way, from the past to the future, is the time of the archeological/archival reference world of Svetlana Maraš. A cyclical time whose different points connect in an endless series of circles, repeating cycles (such as day and night, seasons, periodic heartbeats, breathing, sleep cycles...) is the time of musical processes, repetitions, movements, breathing phrases, cyclic forms of composition. Svetlana Maraš poetically describes her fictional scenario as a revival of the non-existent past from the perspective of a very distant, dystopian, post-apocalyptic future.[26] One can close a small circle here and draw a parallel with Schaeffer's concept of concrete musical experience, which is "based on working with sound objects that are not specified by numbers, seconds, but *parts of time torn out of space*."[27] By careful exploration and digging to the depths of the imagined prehistory of sound, Svetlana Maraš reaches the cosmos of small sounds, those created in detail, selected, and processed. Time

[24] "In the beginning, in the uterine darkness, was the voice, the Mother's voice. For the child once born, the mother is more an olfactory and vocal continuum than an image. Her voice originates in all points of space, while her form enters and leaves the visual field. We can imagine the voice of the Mother weaving around the child a network of connections it's tempting to call the *umbilical web*." Michel Chion, *The Voice in Cinema*, New York, Columbia University Press, 1999, 61.

[25] Svetlana Maraš, *Program note*

[26] *An online conversation* (25 March 2022)

[27] Biljana Srećković, *Modernistički projekat Pjera Šefera: Od ispitivanja radiofonije do muzičkih istraživanja*, Beograd, Fakultet muzičke umetnosti, 2011, 49.

sometimes leaves a patina on her objects, sometimes bypasses them, and sometimes turns them into vague memories. Some of the sounds remain evocative enough to draw the listener deep into the scenes of the cinema for the ear in which different times and perspectives of sound meet.

* * *

The composition *Post-Excavation Activities* by Svetlana Maraš won the Composers' Association of Serbia "Stevan Mokranjac" award for 2020. This prestigious recognition for the most successful work by a Serbian author that had its premiere in the previous year was awarded for the second time to a work belonging to the radiophonic genre.[28] "For me, the awarding of the prize to a radiophonic piece which rests on foundations of electroacoustic and (maybe even more) electronic music is, above all, a symbol of the presence of this kind of contemporary music not only in the concert setting, but in an everyday context, and that is the context that radio to a great extent enables (allows, provides)."[29]

According to Marija Ćirić, a more precise genre determiner of composition would classify it in the domain of experimental radiophony in its "most abstract subtype," "the most subjective form of expression with sound/music." The connection between concrete/electronic/electroacoustic music and radiophonics is most apparent here (...)."[30] Svetlana Maraš's compositional work is primarily realized in the domain of electroacoustic music, and since 2016 and the beginning of her engagement in the Electronic Studio of Radio Belgrade, her artistry has been deeply connected to radio as a place of creation and a specific medium.

The author herself describes radio as a place of *playfulness with sound*,[31] *a space of freedom of creation*, *a laboratory of sound*.[32] Laboratory *Post-Exca-*

[28] Since the establishment of the "Mokranjac" Award in 1994, the only radiophonic work that has been awarded is A Large Stone, a radiophonic poem by Ivana Stefanović, which premiered in 2017.

[29] Milan Milojković, *Razgovor s povodom*

[30] Марија Ћирић, "Игра и музикалност као претпоставке радиофоније", in: Ивана Медић (Ed.), *Радио и српска музика*, Београд, Музиколошки институт САНУ, 2015, 101–114.

[31] "Understanding the theater of sound as the art of music, that is, resignifying/moving to the position of a related discipline, music, is *ludus per se*. This – again – points us to the experimental form as a game of expressing the author's micro or macrocosm." Marija Ćirić, ibid.

[32] *An online conversation* (25 March 2022)

vation Activities remain in the archives of the Electronic Studio as one of the treasured compositions that continue the tradition of cultivating the experimental radiophonic form on Radio Belgrade.[33]

"What makes the Belgrade Electronic Studio special is the fact that it is part of Radio Belgrade. This is already enough to characterize it as a unique specimen of its kind in the world, because the radio infrastructure not only provides immense possibilities for the content presentation, but also affects the production and what is being created in the studio. Precisely because it is the institutionalized place of research and production of electronic music, the Electronic Studio of Radio Belgrade also produces content that is professionally selected and which is in dialogue with the heritage of electro-acoustic music created in it. All this is reflected in the music that comes out of there..."[34]

Translated by the author

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[33] Despite the ups and downs of the Electronic Studio of the Third Program of Radio Belgrade, founded in 1972, from its practice and tradition, over the years, many significant experimental authors' works (such as Vladan Radovanović, Ivana Stefanović, Arsenije Jovanović, and others) were produced. The series *Radionica zvuka* (started in 1985) of the Radio Belgrade Drama Program is especially deserving of the fostering and promotion of radio forms. As an incentive for the authors of the youngest generation to research radio art (drama and music), since 2006, the student award "Neda Depolo" has been established, a recognition for creative contribution to radio expression.

[34] Milan Milojković, *Razgovor s povodom*

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CHAMBER MUSIC OF SZILÁRD MEZEI AND DIFFERENTIATED CONGRUENCE IN ITS COMPOSING LAYERS (II)[1]

Abstract: A look at the morphology of the musical language of the Vojvodina composer Szilárd Mezei reveals different relations among its composing layers. On a selection of fifteen of Mezei's chamber compositions, the basis of their compositional structure was abstracted and typologically classified into four fundamental ways of co-existence of textural layers. These modalities are defined as *differentiated congruence*. The chosen syntagm does not refer to the mathematico-logical meaning of congruence, but to the resemantization of that notion in the context of the fact-object

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[1] A more detailed contextualization of Mezei's works, a comparison with other related authors, as well as the analysis of the discussed works as a whole, and not only partially as it is presented in this text, can be found in the first paper entitled "Chamber Music of Szilárd Mezei and Differentiated Congruence in its Composing Layers (I)", *New Sound*, 58, II/2021, 137–159.

reality of musical space-time. Although none of these four types of congruence is specific only to the musical world of Szilárd Mezei, the fact that they appear in the composer's work somewhat proportionally indicates specific ideological aspirations included in the poetic plane of the work.

Keywords: Szilárd Mezei, differentiated congruence, identical, homogeneous, heterogeneous, opposite

Examples of artistic transpositions of musical folklore have been so numerous and ubiquitous since the middle of the 18th century, that they are not to be considered as a particularity of the creative approach of a contemporary composer like Szilárd Mezei. Certainly, Bartók's turn from the romantic to the modernist articulation of folk songs and dances is an unavoidable stop on the way to Szabados and Mezei's opening of the "modern gateway to primordial origins"[2] in the registers of contemporary improvisational and composed music.[3] Two leading Vojvodina composers of the second half of the 20th century, Rudolf Bruči and Ernő Király, also treated folklore as a source of material and abstract compositional and technical principles in their modernist and – in Király's case – avant-garde-experimental works.[4] All this, however, does not mean that the artistic intention of Szilárd Mezei resides in the comfort zones of tried and tested recipes. An analytical look at Mezei's chamber music does not confirm the assumption of another practice of arranging folk melodies, but requires finding an alternative description that respects both

[2] The "modern gateway to primordial origins" is Adorno's (Theodor Adorno) metaphor for the cultural correlate of the new barbarism in the societies of late industrial capitalism. Igor Stravinsky's music was the first to bear the burden of this negative qualification; yet, it can be applied without pejorative connotations to all modernist folklore that seeks a foothold in the ritual. Compare with: Teodor Adorno, *Filozofija nove muzike*, Belgrade, Nolit, 1969.1

[3] Compare with: Nemanja Sovtić, "Szabados György gondolatrendszere – jazz, hagyomány, rögtönzés a dacoló számkivetettség és lüktető szellemiség világ (lás) ában": *Szabados*, Budapest: MMA Kiado, 2019, 69–86.

[4] About the place and role of folklore in the modernist creative poetics of Bruči and Király, see the monographic study by Nemanja Sovtić *Несврстани хуманизам Рудолфа Бручија* [Nesvrstani humanizam Rudolfa Bručija] (Novi Sad: Matica srpska, 2017) and the review of the same author entitled "Artistic Research in the Space Between Composition, Improvisation and Sound Experiment: Reactions on Ernö Király" (*Ernő Király – Life in Music*, eds. Milan Milojković, Nemanja Sovtić, Julijana Baštić, Novi Sad, Academy of Arts, 39–54).

the declared poetic strongholds and less transparent specifics derived from those strongholds. One of such specifics is reflected in the musico-dramaturgical use of symmetrical and asymmetrical structures of the composing layers.

Symmetries and other equivalence relations exist in Mezei's music, but they can be subsumed under *genus proximus* rather than *differentia specifica* regarding the author's individual musical style. We find them in contrasting-analogous[5] complementarities of musical flow, reprising[6] and repetitive[7] procedures at the micro formal and macro formal level, as well as within bordering phenomena where only certain parameters are recognized in the changeable repetition or transfer of segments of musical form. Viewed from the theoretical perspective of Berislav Popović, the author who systematized formal patterns based on fundamental musico-creative procedures – repetition and change – and symmetrical structures in the narrow sense, Mezei's musical form usually belongs to the type of form derived from the combination of repetition and change, where the procedure of change prevails (A + B + C + A + ...), although the form based solely on the procedure of change can also be found (A + B + C + D + ...). In that sense, Mezei's musical form is quite typical of the modern compositional practice of the second half of the 20th century that emerged under the influence of the *zero hour* idea of a radical break with the ideologically compromised neoclassical tradition. The individualization of the musical form achieved by suppressing the literal repetition in favour of change and subtle, unobserved and re-interpreted returns to what has already been seen, can, but not necessarily, be attributed to Mezei's education at the Belgrade Faculty of Music under Professor Zoran Erić. The fact is, however, that archaic songs and dances presuppose repetition to change, and that folk music tradition is most meaningfully included in con-

[5] According to Berislav Popović, contrast in music can be defined as an inequivalent set of elements that acts as a "dent" / "fluctuation" in musical space-time, while the principle of analogy implies the ensuring similarity of individual parts of the form by the congruence of elements not of those musical components on whose earlier appearance the identity of one musical flow depended, but some other, equally observable musical components. Compare with: Berislav Popović, *Muzička forma ili smisao u muzici*, Belgrade, Clio, 1998.

[6] Reprise in the most general sense implies the repetition of a segment of the form after something else, rather than immediately.

[7] Repetition in the most general sense implies repeating passages immediately one after the other.

temporary compositional and performing trends through the improvisational principle of shaping the musical flow, as Mezei established through his practice.

If we define the musical form in the broadest sense as a way of arranging a relatively small and clear number of basic elements within larger wholes,[8] Mezei's musical form is not only *differentia specifica*, but also *differentia ultima* of his music, not in terms of horizontal "structural relations" though, but vertical "relations of dependence (relations of superiority and subordination)".[9] The answer to the question about the stylistic peculiarity of Mezei's chamber music should be sought in the formal-dramaturgical functionalization of (dis)symmetrical structures of the composing layers.[10] Al-

[8] Berislav Popović, *Muzička forma ili smisao u muzici*, Beograd, Clio, 1998, 18.

[9] Ibid, 19.

[10] According to Popović's theory, the laws of symmetry and consistency are the main formative principles in music. The basic principle of equivalence is abstracted from the relations of similarity between the segments of the musical form and encompasses a wide range of formal relations from the minimally similar to the identical. Between the bordering phenomena of equivalence, there are symmetrical relations, which imply the recognizability of only certain parameters during the changeable repetition or transfer of segments of the musical form. Such relations are not completely equivalent ("disrupted repetitions", "deformations of initial conditions", "transformative essence of the musical flow", "discrete 'bearing capacity of' equivalent relations", "hidden symmetries"). The domain of incompletely equivalent musical relations unites the fundamental procedures of repetition and change, and regulates the emergence of segments of a "higher" order according to the principle of minimum similarity and minimum difference. Outside this domain, fundamental musico-creative procedures, repetition and change, exist as mutually defining and mutually opposed procedures that appear in music of the reprising and (or) repetitive character in their crystallized form, while in the sphere of unbroken relations, as provided, for example, by the (developmental) variation technique, repetition and change are dialectically reconciled. The procedure of change, which dominates the modernist music of the 20th and 21st centuries, as well as the music of Szilárd Mezei, involves the permanent innovation of material within formal sections connected based on contrast or through the principle of analogy. Reduced to the relations of repetition and change, the musical form can be represented by the following set of formal schemes:
1. A + A + A + A + ...: a form built only on the basis of the repetition procedure
2. A + B + C + D + ...: a form built only on the basis of a change procedure
3. A + B + A + B + ...: a form built on the basis of combining the procedure of repetition and the procedure of change with equal alternations
4. A + B + A + C + A + ...: a form built on the basis of a combination of the two aforementioned procedures, with the predominating repetition procedure

though Popović's definitions and classifications are a very useful theoretical tool for locating panstylistic symmetrical relations in music, Mezei's compositional structure does not reflect the usual division into plane, axial reflection, axial rotation, character and permutation symmetries, and it is necessary to move away from the relations of standard equivalence according to the framework of interpretation that will be introduced for the purposes of this research as the *differentiated congruence of composing layers*. Obviously, this is not a mathematical notion of congruence, which is used primarily in geometry and set theory, while in other areas of mathematics it essentially corresponds to the relation of equality. Since there can be no differentiated equations – these are inequations then – the concept of differentiated congruence has no mathematico-logical or semantico-linguistic basis, but refers to a specific context of the imaginary universe of music in which the common situation of even very different sets of elements leads to their congruence within the higher-order musico-logical segments. The congruence of unequal layers of musical material is spatio-temporal, at the level of ontologically independent and irreducible continuum of musical space-time. Congruent sets of elements are divided into voices / parts; they stand together and are superimposed on each other through flirting with differentiation that enriches musical relations. The modalities of this common existence and differentiated congruence range from identity to difference. They can be conditionally divided into *identical*, *homogeneous*, *heterogeneous* and *opposite*. It is,

5. A + B + C + A + ...: a form built on the basis of a combination of repetition and change procedures, with the predominating change procedure.

Reduced to symmetrical relationships, the musical form can be:

1. A + B + A': the form in which symmetry is present

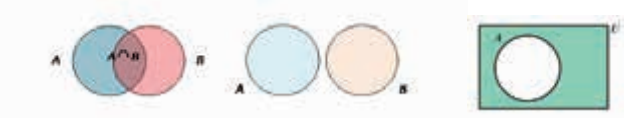
2. A + B + C: the form in which symmetry is excluded

According to Popović, symmetries are created thanks to the appropriate arrangement of equivalent elements. Equivalence is either complete (elements are the same) or incomplete (elements are similar). There are different symmetries. The simplest are the so-called 'spatial vector' symmetries that are perceived in music as effects on musical-two-dimensional space ('axial' or 'plane' symmetries); then there are 'axial reflection' symmetries ('left-right', 'mirror-image') as a specialized subset of axial or plane symmetries; there are also symmetries of 'axial 180-degree rotation' – a kind of combination of space-time influence that is accompanied by a perceptive notion of quasi-musical-three-dimensional space. In addition to the above, Popović also singles out 'character' symmetries and 'permutation' symmetries. In the music of Szilárd Mezei, symmetrical relations follow Popović's categorization, but they also transcend it, which is why the notion of differentiated congruence of textural layers was introduced.

therefore, a matter of differentiated spatio-temporal congruence of segments of musical material within the composing layers.

Mathematical relations of equality, approximate equality and inequality are not the most adequate means for presenting the typology of differentiated congruence. Conditionally, however, representations of identical congruence with the statement A = A (A is equal to A) can be accepted; homogeneous congruence with the statement A ≈ A' (A is approximately equal to A'); heterogeneous congruence with the statement A ≉ A' (B) (A is approximately unequal to A' / B); opposite congruence with the statement A ≠ B (A is not equal to B). The mathematico-symbolic writing of the presented relations indicates the variability of the relationship between the identical and the homogeneous on one hand and the heterogeneous and opposite congruence on the other. It is important to point out that the experiential, specifically musical criterion is crucial in the analytical classification of grouped elements of musical material, because just as the identical, homogeneous, heterogeneous and opposite cannot be reduced to mathematical relations of congruence, difference, disjunction and complementation in set theory,[11] these relations

[11] The concept of the set theory is that each set A is equal to itself: A = A. There is no other set equal to set A, and set A is congruent only to itself. Sets A and B are different when they have an intersection, and disjoint when their intersection contains no element. Assuming that the universal set is infinite (the universal set is a superset of every other set and represents a philosophical concept whose existence in mathematics is put to the test), then for each set A there are infinitely many sets B that are different. The opposition / complementation relation is realized by an empty intersection between set A and the rest of the universal set (from which the elements of set A are excluded). The formula for expressing the complementation relation is C (A) = U – A, where C (A) is a complement and U is the universal set. The relations of difference, disjunction, and opposition / complementation are usually represented by Venn diagrams:



If we use Venn diagrams as a heuristic tool, we can use them to mathematize the spatio-temporal relations of homogeneity and heterogeneity as relations between sets of elements of the musical continuum, while the relations of identity and opposition remain impossible to be presented. The conditions for the relation of homogeneity are 1) the minimum difference between the elements of two sets and 2) the intersection which is not less than the difference between the two sets. The condition for the heterogeneity relation is an intersection that is less than the difference between the two sets. Heteroge-

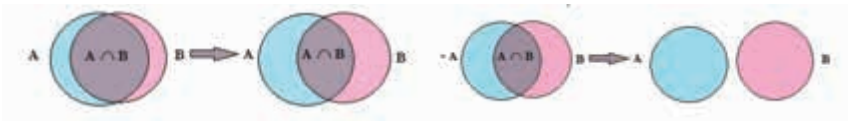
cannot be physically grounded in measurable areas of acoustic reality, since, for example, two melodies that auditory experience recognizes as identical appear very different if they are decomposed into frequencies, volume, and spectrum of harmonies. The introduction of experiential assessment as a verification tool for assessing the validity of types of congruence undermines the empirical but not rational foundation of this analytical approach, because the relations of identity, homogeneity, heterogeneity and opposition can be linked to concrete, verifiable and repeatable forms of composing layers. Thus, in the chamber music of Szilárd Mezei, which is the subject of this research, the congruence of the identical appears in the form of a unison compositional setting; the congruence of the homogeneous in the form of a tonal cluster and (or) chord heterophony, free polyphony of separate and contrasting undifferentiated voices, and single-layer new sound textures / blocks; the congruence of the heterogeneous in the form of the non-hierarchical polyphony of voices and textural layers; the congruence of the opposite in the form of a subordinate relationship of leading and accompanying voices. The connection between the analytico-theoretical model and the material area for which it is intended needs to be explained in more detail. In order to free the main text of taxonomic sameness, concrete examples of differentiated congruence in Mezei's chamber music are mostly given in the footnotes.

Identity, homogeneity, heterogeneity, opposition

In Szilárd Mezei's chamber music, the textural equivalent of the identical congruence is the unison compositional setting within which the voices / parts bring identical musical material. Depending on whether the doubling of a unison one-part melody is realized by all or only some voices / parts

neous sets can be disjointed and complementary, so the existence of at least a minimal intersection between two sets is not a condition for the relation of heterogeneity in this specific context. By modifying Venn diagrams, homogeneity and heterogeneity can be presented as relations with a limited but infinite number of concretizations.

Relation of homogeneity Relation of heterogeneity



within the ensemble, this congruence may be complete[12] or incomplete[13]. The disrupted[14] and zero[15] congruence belong to the bordering identical congruence. In the first, there is a unison movement of all voices except one, regardless of which it does not have the effect of heterophonic polyphony (homogeneous congruence), polyphonic correlation (heterogeneous congruence) or melody-accompaniment hierarchical correlation (opposite congruence), but acts as a "misstep" in the material continuum of the composing layers. What is meant by zero identical congruence is independent, unpaired lines without any accompanying textural layers.

Homogeneous congruence includes situations in which all the voices / parts within the compositional structure bring similar but not identical material. The relation of non-identical similarity occurs between voices / parts that are rhythmically congruent, but melodically different, whether it is a transposition or some other difference. Within textures / blocks, realized by aleatoric or (micro) polyphonic means, voices / parts can be the same in all sound parameters and be completely undifferentiated in a linear sense, but they can still be identified separately. According to the compositional struc-

[12] The complete identical congruence in Mezei's chamber music can be found in *Orlando Application* (doubling of the homorhythmic melody, bars 447–450), *Hep 13 A. T.* (doubling of the heterorhythmic melody, bars 114–128), *A jövő könyve* (doubling of the heterorhythmic melody, bars 10–39), *Hep 30 B* (doubling of a homorhythmic pointillist figure, bars 1–5) and *Hep 21 E / 22 L* (doubling of the transitional form between a homorhythmic and heterorhythmic melody, bars 40–45).

[13] The incomplete identical congruence is found in the works such as *Orlando Application* (doubling of a melody based on pointillist-motif cells and heterorhythmic melody, bars 270–285), *Hep 13 A. T.* (complementary / antiphonal alternation of an independent line and heterorhythmic motif cell, bars 114–128) and *Hep 21 E / 22 L* (doubling of the heterorhythmic melody, bars 29–38).

[14] The disrupted identical congruence is found exclusively in Mezei's early chamber works such as *Csip csip* (in unison based on a homorhythmic melody in counterpoint with a pointillist cell and a repetitive-aleatoric figure, rehearsal number [3], bars 6–10), *Hep* (in unison based on the transitional form between homorhythmic and heterorhythmic melodies in counterpoint with pointillist cells, bars 13–17) and *Trio for Flute, Piano and Percussion* (doubling of heterorhythmic melody in counterpoint superposition with pointillist-motif cells, rehearsal number [1]).

[15] The zero congruence in the form of an independent voice / part is found in the compositions *A jövő könyve* (bars 1–10), *Örizgető* (rehearsal number [1]), *Trio for Oboe, English horn and Bassoon* (rehearsal number [3] and rehearsal number [5]), *Trio for Violin, Viola and Cello* (rehearsal number [14a]).

ture, there can be distinguished linear-polyphonic, cluster-chord and textural homogeneous congruence. Linear-polyphonic and cluster-chord homogeneous congruence dominate in Mezei's non-aleatoric works from 2010, such as *Orlando Application*,[16] *Hep 13 A. T.*,[17] *Stuffed Hippos*,[18] *A jövő könyve*,[19] *Hep 30 B*,[20] *Hep 21 E / 22 L*[21] and *Resistor*,[22] while the textural correlation of

[16] The composition *Orlando Application* brings a textural homogeneous congruence in the form of vertically synchronized and successively filled aleatoric (micro) polyphonic textures (rehearsal number [4], rehearsal number [6]). In this composition, we also find a transitional form between cluster-chord and linear-polyphonic homogeneity, in the form of a successively filled block with a variable compositional structure (bars 1–12). There is also a cluster-chord homogeneous congruence achieved on the basis of homorhythmic melodic heterophony and pointillist-motif cells (bars 96–103 and bars 190–193).

[17] Most of the *Hep 13 A. T.* structure was built as a heterorhythmic-polyphonic texture, that is, a polyphony of contrasting undifferentiated voices (rehearsal number [3]). Occasionally, there can be found a genuine linear-polyphonic homogeneous congruence in the form of the free polyphony of voices (rehearsal number [3]), as well as a cluster-chord variant of superimposing the material units of the compositional structure (bars 236–240).

[18] The transitional form between the linear-polyphonic and textural homogeneous congruence is the basis of another of Mezei's chamber works – *Stuffed Hippos* – whose inner section completely reflects a beat of a heterorhythmic-polyphonic texture of variable density (bars 5–8).

[19] In *A jövő könyve*, the musical material moves from the state of strict and complete homogeneous congruence to the linear-polyphonic version of this relation between textural layers, through "drawing apart", that is, the partially separate profiling and polyphonic intertwining of voices / parts (bars 45–53).

[20] In *Hep 30 B*, the composer resorts to a similar solution – he abandons the identical congruence in favour of the homogeneous congruence, transforming pointillist-motif cells into pointillist-heterorhythmic texture. The linear-polyphonic form of the compositional structure appears in this composition in the forms of isorhythmic heterophony (bars 54–56) and canonic imitation (bars 129–131).

[21] In the composition *Hep 21 E / 22 L*, there is a transitional form between cluster-chord and linear-polyphonic homogeneous congruence (bars 1–6 and bars 259–264). Four flutes in the register range from bass to piccolo appear at first as the folklore-sounding heterorhythmic heterophony, only to have their parts arranged later into a successively filled (micro) polyphonic texture (bars 104–107) and a pointillist cluster-chord vertical (Example 34).

[22] Another composition for flute quartet, *Resistor*, contains examples of transitional forms between textural and linear-polyphonic homogeneous congruence, in the form of kinetic homorhythmic polyphony (Example 36) and florid heterorhythmic polyphony (bars 115–124).

the same material predominates in the composer's earlier works, such as *Hep 7 B*,[23] *Csip csip*,[24] *Örizgető*,[25] *Tibety gyors*[26] and three *Trios*[27] from the 1990s.

On the other pole, against the identical and homogeneous, there is the heterogeneous and opposite correlation of the textural layers of the musical material. Within the heterogeneous congruence, there are no "pops" of observable lines in the voices / parts, but only their superpositions on equal bases. The heterogeneous congruence is, along with the homogeneous congruence, relatively the most common in relation to other types of differentiated congruence of the compositional structure. It can be symmetrical and asymmetrical, depending on whether the voices / parts in the non-hierarchical polyphony of the compositional structure participate equally or not. An-

[23] *Hep 7 B* contains examples of both cluster-chord and textural homogeneous congruence (bars 30–35 and bar 91).

[24] The composition *Csip csip* brings aleatoric textures with exactly determined parameters of pitch, duration, dynamics and articulation (rehearsal number [6]), as well as approximate definitions regarding the pitch and duration, and accurate in terms of dynamics and articulation. In the same composition, one can also find micropolyphonic textures, both those vertically synchronized (rehearsal number [9]) and successively filled (rehearsal number [13]).

[25] The heterorhythmic polyphony of undifferentiated voices that forms a transitional form between the linear-polyphonic and textural homogeneous congruence is found in the composition *Örizigető* (rehearsal number [9]), together with the aleatoric texture (rehearsal number [13]). That there is no extreme compositional-technical discontinuity between Mezei's earlier and later works is proved by the example of the mentioned composition for wind quintet, which contains examples of cluster-chord homogeneous congruence in the form of the so-called "harmonic polyphony" (bars 40-45) and isorhythmic homophony (rehearsal number [16]).

[26] In *Tibety gyors*, the manifestations of cluster-chord and linear-polyphonic homogeneous congruence occur through isorhythmic heterophony (Example 46) and homorhythmic polyphony (rehearsal number [28]).

[27] Compositions from the last decade of the last century manifest the equal representation of the differentiated congruence of the compositional structure within the category of homogeneity. Both the linear-polyphonic and cluster-chord versions of the structure built of homogeneous layers are present in all three *Trios* from this period, in the *Trio for Flute, Piano and Percussion* (rehearsal number [2b] and rehearsal number [3b]) , *Trio for Oboe, English horn and Bassoon* (rehearsal number [1], rehearsal number [2], rehearsal number [4], rehearsal number [5a] and rehearsal number [7]) , as well as the *Trio for Violin, Viola and Cello* (rehearsal number [4] – [6], rehearsal number [8b], rehearsal number [13b] and rehearsal number [16]). The textural homogeneous congruence is found in the *Trio for Oboe, English horn and Bassoon* (rehearsal number [2]) and the *Trio for Violin, Viola and Cello* (rehearsal number [4]).

other definition of the subtypes of heterogeneous congruence concerns the types of the textural layers themselves. Linear-polyphonic and textural types dominate, but there are examples of "hybrid crossings" of melody and texture, cluster-chord heterophony and texture, pointillist-figural cells and motifs. More often than other "hybrid forms" there is a linear-textural heterogeneous congruence, characteristic of Mezei's early works from the 1990s and 2000s. Later works, such as *Orlando Application*, in addition to symmetrical forms of textural and linear-polyphonic heterogeneous congruence (rehearsal number [14] and bars 286–299), also contain more subtle combinations of different composing layers.[28] The symmetrical linear-polyphonic heterogeneous congruence, in the form of the counterpoint superposition of equal voices / parts, is found in the works such as *Hep 13 A. T.* (bars 180–181), *Stuffed Hippos* (bars 1–3), *A jövő könyve* (bars 96–114)), *Hep 21 E / 22 L* (bars 15–20), *Tibety gyors* (rehearsal number [20]), *Hep 7 B* (rehearsal number [1]), *Trio for Flute, Piano and Percussion* (rehearsal number [2]) and *Trio for Violin, Viola and Cello* (rehearsal number [1] and rehearsal number [18]). The asymmetric linear-polyphonic variant of layering the different elements of the material is present in the compositions such as *Hep 30 B* (bars 164–177), *Hep 21 E / 22 L* (bars 156–173), *Hep 7 B* (rehearsal number [14]), *Trio for Flute, Piano and Percussion* (rehearsal number [2]) and *Trio for Oboe, English horn and Bassoon* (rehearsal number [2]). The asymmetrical textural and symmetrical linear-textural heterogeneous congruence can be found in the composition *Csip csip* (rehearsal number [4]), as well as the asymmetrical textural and asymmetrical pointillist-figural variant in the form of the pro-

[28] In *Orlando Application*, the asymmetric linear-textural variant can be found in the form of counterpointing the doubled melody and aleatoric-improvisational texture (bar 328–328), while the asymmetric pointillist-figural congruence is found as a superposition of pointillist-motif cells and ostinato figuration (bars 489–503). Transitional forms between two typical manifestations of the heterogeneous congruence include a transitional form between textural and pointillist-figural variants, realized through the polyrhythmic layering of repetitive-ostinato figures and pointillist cells (bars 612–627). There are also skillfully carried out transitional forms between the heterogeneous and the opposite congruence, where within one formal-musical situation one moves from counterpointing equal voices to distinguishing the leading voice from the polyphonic accompaniment (bars 213–223). Particularly striking is the evolutionary (non-contrasting) transition from the linear-chord opposite congruence to the linear-polyphonic heterogeneous congruence, and then to the cluster-chord homogeneous congruence, all the way back to the linear-chord opposite congruence – achieved within one musical-formal situation! (rehearsal numbers [16] – [18])

jection of pointillist-motif cells over repetitive figures (rehearsal number [3]). In *Örizgető* we find a successive combination of asymmetric linear-textural and asymmetric textural heterogeneous congruence, derived from the transition from the counterpoint superposition of isorhythmic cluster heterophony and aleatoric texture to the counterpoint superposition of two micropolyphonic textures (rehearsal number [7]). The *Trio for Violin, Viola and Cello* brings an asymmetrical pointillist-figural heterogeneous congruence in the form of a counterpoint superposition of pointillist-motif cells and a repetitive figure (rehearsal number [3]), as well as the asymmetric textural variant of this differentiated congruence, obtained by layering a (micro) polyphonic texture and an independent aleatoric and (or) improvisational line (rehearsal number [18]).

The subordinated relationship of leading and accompanying voices / parts within homophonic, heterophonic and polyphonic compositional structures is characterized by the opposite congruence. It refers to a melody-accompaniment texture in folkloristic stylistic complexes or a projection of independent linearity over texture / block in certain segments of form. The musico-dramaturgical removal of the textural layers results in the effect of their opposition in order to contrast the dynamization of the musical flow, so the "opposite" as an extreme kind of "different" is inscribed in the very subordination relationship. Once again, the *Orlando Application* is the source of the most diverse forms and ways of using a differentiated congruence of the compositional structure.[29] For Mezei, it is atypical to find the complete domination of a single type of congruence as we find it in the musical flow of the composition *Hippo Hippopotamus*, which entirely manifests the textural relationship of the opposite congruence on the basis of the hierarchical correlation of pointillist-motif cells and the repetitive-ostinato figure. The opposite congruence is also found in the works *Hep 30 B* (bars 85–87), *Hep 21 E / 22 L*,[30] *Csip csip*,[31]

[29] In the composition *Orlando Application* the opposite congruence can be found based on hierarchical relationships 1) static tonal cluster blocks and pointillist-motif cells (rehearsal number [7]); 2) aleatoric textures and motif cells (bar 185); 3) figural accompaniments and cluster-chord homophonies (rehearsal number [51]).

[30] The polyphonic compositional structure at a certain point of the composition *Hep 21 E / 22 L* is based on the subordinated relationship between the melody and the ostinato accompaniment (bars 239–254).

[31] *Csip csip* shows the opposite congruence based on a similar relationship between melody and aleatoric-repetitive texture (rehearsal number [11]), as well as melodies and figural-ostinato accompaniment (rehearsal number [12]).

Örizgető,[32] *Tibety gyors*[33] and *Trio for Flute, Piano and Percussion*[34].

The differentiated congruence of the identity, homogeneity, heterogeneity and opposition are not just descriptions of the structural relations that prevail between the textural layers in Szilárd Mezei's chamber music. It is precisely by abstracting the relations of congruence that a new view of symmetry in Mezei's musical space-time is provided. What manifests itself in the spatial-temporal distribution of materials as a scattered evolutionary-developmental or reprise-architectural form, viewed from the perspective of "the organization of relations" of differentiated congruence, becomes a more reduced, simpler and elegant expression of the macro formal plan. For example, the composition *A jövő könyve* is entirely based on the formal redistribution of differentiated congruence of identity and homogeneity. The first type of the relationship strongly dominates in the outer sections, while the second is reserved for the inner section. It is similar with the compositions *Resistor* and *Stuffed Hippos*, where in the outer sections of the *Resistor* the homogeneous congruence prevails, and in the inner one the heterogeneous congruence, while the outer *senza misura* sections of the composition *Stuffed Hippos* are completely based on the heterogeneous congruence, and the inner rhythmical section on the homogeneous congruence. The musical flow of the composition *Csip csip*, on the other hand, is shaped without a significant macro formal alternation and the appearance of various types of differentiated congruence, and is almost entirely based on the heterogeneous congruence in different linear-textural combinations. It is a similar situation with the composition *Örizgető*, which is almost entirely derived from the heterogeneous congruence in the variants of linear-polyphonic layers of texture. Mezei's other works can also be analyzed from the "organization of relations"

[32] Hierarchical correlation in the melody-accompaniment style can be found in *Örizigető*, where melodically treated fragments of cluster-chord heterophony are distinguished in relation to aleatoric-textural accompaniment (rehearsal number [3]), or melody as such – in the form of a singular voice line / part – occurs accompanied by the repetitive-ostinato layer of the texture (rehearsal number [15]).

[33] The specificity of the appearance of the opposite congruence in *Tibety gyors* is reflected through the basso continuo rhythmico-melodic distinguishing of the accompanying line and its suggestive positioning in the cello section (rehearsal number [20]).

[34] The way in which the opposite congruence is manifested in the *Trio for Flute, Piano and Percussion* stands out from the others due to the special shaping of the accompanying layer of the texture, which takes the form of distinct pointillist-chord cells (rehearsal number [3]).

of the viewpoint of differentiated congruence at the macro formal level, but the results of these analyses do not significantly complement the traditional analysis of musical form.

About the ideological tendency behind an artistic practice

> The interaction and hierarchy of musical elements are the basic and constant properties of the musical flow, just as the continuous coordination of all elements in it determines solid musical form.[35]

The observation of Berislav Popović – our most famous theorist of musical form – can be reformulated so that it resonates more closely with the problem analyzed in this paper: The interaction and hierarchy of musical elements are the basic and constant properties of the composing structure, and the continuous coordination of all elements in it determines the level of differentiated congruence of textural layers. The richness of the world of Szilárd Mezei's chamber music is not even close to being explained by the description of structural relations in one parameter of expression / construction. The complexity of the immanent being of Mezei's music can only be approached through a detailed and broad stylistic analysis, while revealing those of his semantic layers that transcend the intra-world matters of music must be entrusted to a carefully chosen interpretive strategy. In this paper, I opted for a more modest goal, while trying to hint at the potential direction of some future theoretical contextualization of Mezei's artistic activity. Although in my musicological discourse the notion of congruence is semantically "stretched" almost to its opposite, it is rightly emphasized within the given terminological corpus. The notion of congruence should refer to the key epistemological problem of the scientific view of the world from which the cognitive value of the artistic experience of reality (still) emerges. According to Hubert Dreyfus and Paul Rabinow in their study on Michel Foucault, "[…] natural scientists do not believe, and are even resistant to discussing the possibility, that the validity of their work is a matter of consensus rather than correspondence".[36] Despite this resistance, the philosophy of science convincingly shows how real the consensus is, and correspondence /

[35] Berislav Popović, op. cit., 55.

[36] Hjubert Drajfus, Pol Rabinov, *Mišel Fuko iza strukturalizma i hermeneutike*, Novi Sad, Mediteran Publishing, 2017, 274.

congruence[37] is the ideal relationship between the world and our idea of it. Although it does not even try, science fails to calm the existential tremor of the human being, whose experience of the world without a correspondence between reality for us and reality in itself is losing ground. Art continues to base its power of legitimacy on this imaginary failure of strategic rationality. Although modern art, as it is defined, has long started on the detection of alienation and fragmentation, one of its ideological tendencies permanently thematizes the possibility of renewing the integral vision of the world, even in the form of a nostalgic review of pre-modern ritual acts and their remnants in collective experience. Szilárd Mezei's artistic contribution should be viewed in the light of his contribution to this stylistic, genre and disciplinary polyvalent ideological tendency. The basic assumption of Mezei's artistic practice, without which the result of that practice would really be reduced only to the sum of material units and the set of their relations, is the possibility of a concrete experience of correspondence that continuously eludes generalization. Singing a tune or dancing to it is the closest thing to such an experience. When an individual sings a song and a group joins him/her, they are as one. Being as one through aestheticized collective participation in a ritual rite constitutes the spiritual legacy of folklore. Folklore is an archaic roadmap towards the attitude where being as one is the nucleus of the experience of the correspondence of man and his world. At the same time, folklore is a challenge to frantic individualization, which Mezei does not try to deny in his work. His artistic attitude is individualistic, and his music is modern in today's already traditional sense, because he strives for authenticity, to stand out from the abundance of similar phenomena, to find his own place in the artistic universe. The inner being of that music, however, beats in the rhythm of melancholy for the experience of the correspondence of man and the world, a correspondence that is now and here. Hence, the congruence of textural layers is important for understanding Mezei's music to the extent that the differentiation of that congruence can be read as the Adornian "diagnosis"[38] of the modern world of life.

[37] The translation of this paper from the Serbian langauge required that „podudarnost", which in the original version appears as a semantically versatile, but terminologically uniform term, be translated as congruence or as correspondence, depending on the context.

[38] Compare with: Teodor Adorno, Filozofija nove muzike, Belgrade: Nolit, 1969.

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Summary

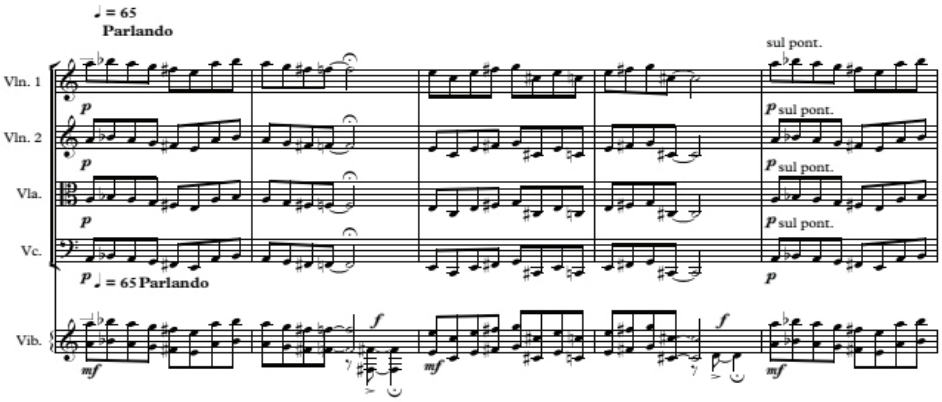
Based on the insights into Mezei's compositional treatment of musical material, it can be concluded that almost all his works are based on abstracted musical folklore, new sound textures and special modalities of formal equivalence in the composing style. These modalities can be represented as a set of differentiated *identical*, *homogeneous*, *heterogeneous* and *opposite* types of congruence in which the extreme ontological-logical perspectives are dissolved and overcome. The unison setting within which the voices bring completely identical material is the setting equivalent of the identical congruence (A = A). The homogeneous congruence, symbolically represented as A≈A' (A is approximately equal to A'), involves a relationship in which all voices yield similar but not identical material. Isorhythmic cluster-chord heterophony, free polyphony of contrastingly undifferentiated voices and single-layered new-sounding textures stand out as setting equivalents of this type of congruence. The heterogeneous congruence implies such polyphony of voices and textural layers that results in a non-hierarchical correlation of the elements of the compositional structure. Within the A ≉ A' (B) (A is approximately unequal to the A' / B) relationship, there is no "popping up" of observable lines in the voices, but only their superpositions on an equal basis. The subordinate relationship of leading and accompanying voices within homophonic, heterophonic and polyphonic compositional structures defines the opposite congruence in the A ≠ B form (A is not equal to B). Contrary to the analytical

insight that emphasizes the structural generalization of relations within one element of the composing style there is a disclosure of those semantic layers of Mezei's opus that transcend the intra-world issues of music. The notion of congruence/correspondence also appears in this context as a reflection on the ideal relationship between the world and our notion of it, for which Mezei's art refers to pre-modern ritual acts and their remnants in the collective experience.

APPENDIX 1: Examples of the identical congruence in the chamber music of Szilárd Mezei

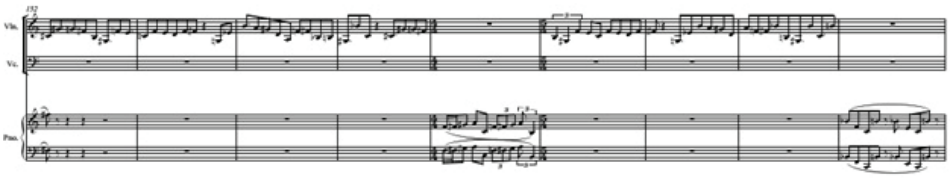
E**xample 1**, *Orlando Application* – complete identical congruence: unison based on a homorhythmic melody, bars 447–450

Audio Example 1, *Orlando Application*, 26:00–26:50[39]



Example 2, *Hep 13 A. T.* – incomplete identical congruence: unison based on the antiphonal treatment of independent linearity and heterorhythmic motif cell, bars 152–160

Audio Example 2, *Hep 13 A. T.* 09:25–10:10[40]

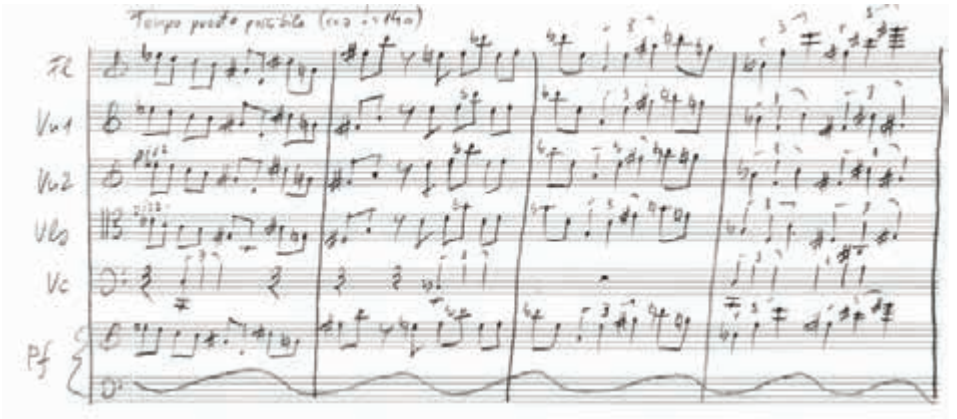


[39] Audio example is available at the following link: https://youtu.be/ZyL0vExeC-Q

[40] https://youtu.be/Mw2QyKOr0L4

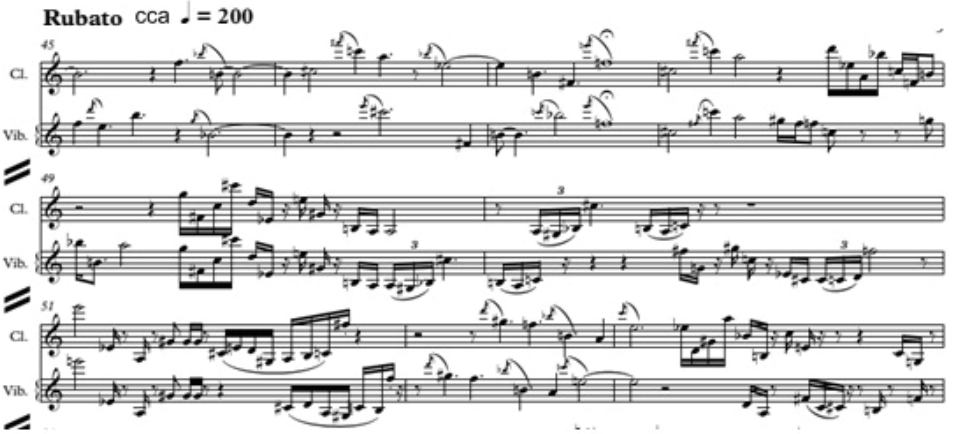
Example 3. *Csip csip* – disrupted identical congruence: unison based on a homorhythmic melody in counterpoint with a repetitive-aleatoric figure (Pf), rehearsal number [3], bars 6–10

Audio Example 3, *Csip csip*, 01:58–02:11[41]



APPENDIX 2*:* Examples of homogeneous congruence in the chamber music of Szilárd Mezei

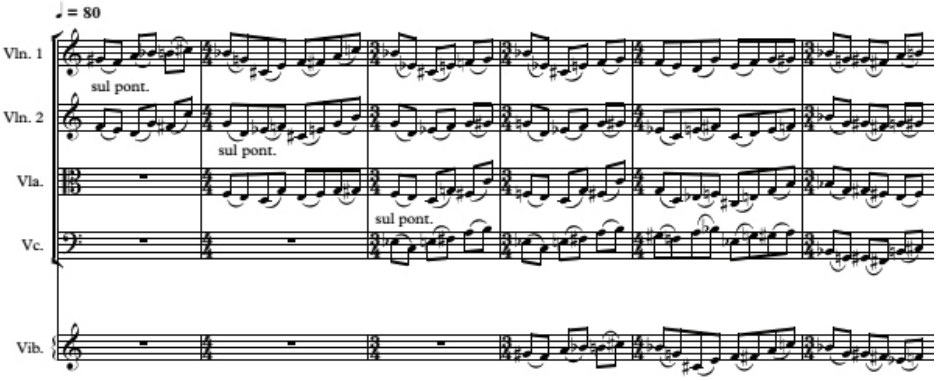
Example 4. *A jövő könyve* – linear-polyphonic homogeneous congruence: free polyphony of voices, bars 45–53



[41] https://youtu.be/yVUD4K27xDM

Example 5. *Orlando Application* – cluster and (or) chord homogeneous congruence, homorhythmic heterophony, bars 96–103

Audio Example 4, *Orlando Application*, 08:44–09:03[42]



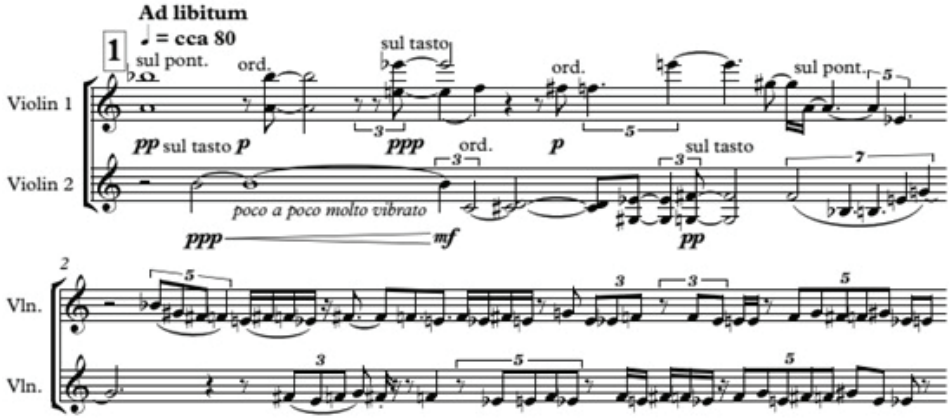
Example 6. *Örizigető* – textural homogeneous congruence: heterorhythmic-aleatoric texture with exact determinations in the parameters of pitch, duration, dynamics and articulation, rehearsal number [13]

Audio Example 5, *Örizigető*, 05:54–06:09[43]

[42] https://youtu.be/gOjsg85at3I
[43] https://youtu.be/nDPWBYm4RnI

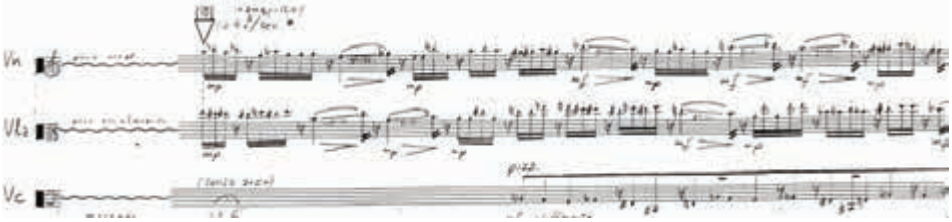
APPENDIX 3: Examples of the heterogeneous congruence in the chamber music of Szilárd Mezei

Example 7. *Stuffed Hippos* – symmetrical linear-polyphonic heterogeneous congruence: counterpoint superposition of voices, bars 1–3.



Example 8. *Trio for Violin, Viola and Cello* – asymmetric textural heterogeneous congruence: counterpoint superposition of (micro) polyphonic texture (Vn, Vla) and aleatoric lines (Vc) in the 2:1 ratio, rehearsal number [18]

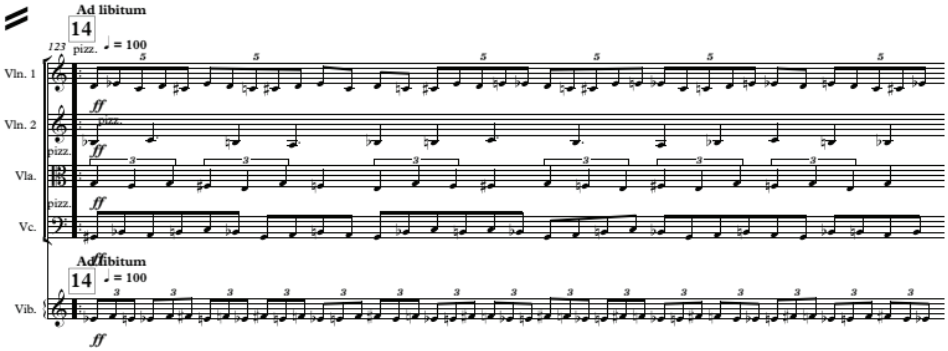
Audio Example 6, *Trio for Violin, Viola and Cello*, 08:13–09:05[44]



[44] https://youtu.be/A-mFktp_9mA

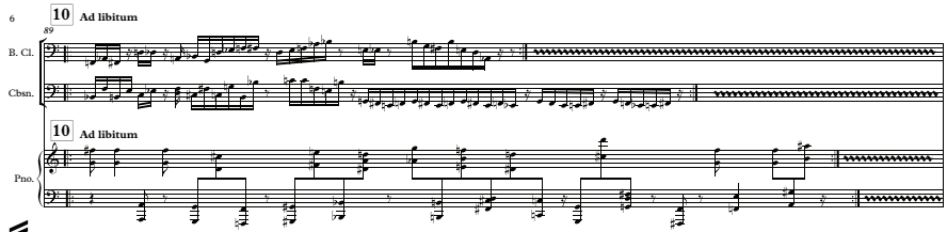
Example 9. *Orlando Application* – symmetrical textural heterogeneous congruence: vertically synchronized micropolyphonic block, rehearsal number [14]

Audio Example 7, *Orlando Application*, 09:56–10:35[45]



Example 10. *Hep 7 B* – asymmetric textural heterogeneous congruence: counterpoint superposition of aleatoric-polyphonic and aleatoric-figural textures in the 1:1 ratio, rehearsal number [10]

Audio Example 8, *Hep 7 B*, 02:56–03:42[46]



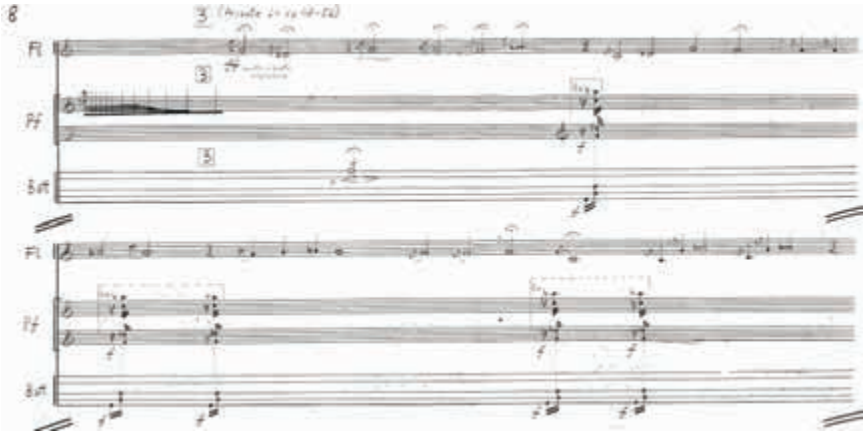
[45] https://youtu.be/iIK7IRBZ828

[46] https://youtu.be/_gTCOIq-XxE

APPENDIX 4: Examples of the opposite congruence in the chamber music of Szilárd Mezei

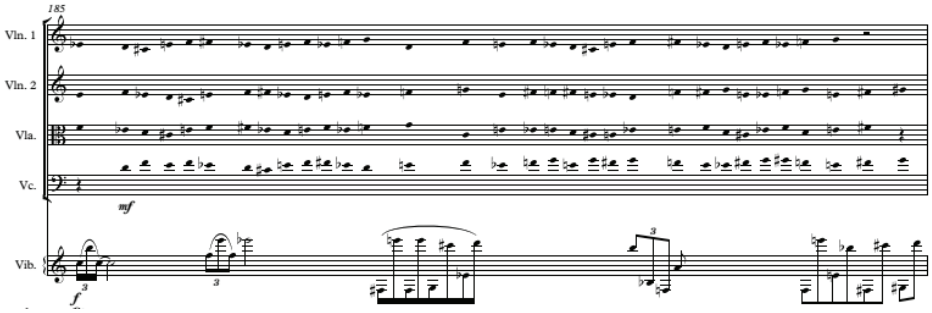
Example 11. *Trio for Flute, Piano and Percussion* – opposite congruence based on a hierarchical correlation between the melody (Fl) and pointillist-chord accompaniment (Pf, Batt), rehearsal number [3].

Audio Example 9, *Trio for Flute, Piano and Percussion*, 04:32–06:18[47]



Example 12. *Orlando Application* – opposite congruence based on a hierarchical correlation between aleatoric texture (Vn1, Vn2, Vla, Vc) and motif cells (Vb), bar 185.

Audio Example 10, *Orlando Application*, 14:32–15:03[48]



[47] https://youtu.be/A-mFktp_9mA
[48] https://youtu.be/ELPJh_nOTqU

REVIEWS

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Joseph Grim Feinberg, *The Paradox of Authenticity: Folklore Performance in Post-Communist Slovakia*, Madison, University of Wisconsin Press, 2018, 234 pages.

"... His performance was the truth, and when the performance threatened to turn from the truth into a lie, he made a sincere effort for the sake of honesty." With this quote from Jonathan Freisen's novel Freedom, the author of *The Paradox of Authenticity: Folklore Performance in Post-Communist Slovakia*, published by the University of Wisconsin, Joseph Grimm Feinberg, pictorially and poetically, despite the book's title with a political connotation, suggests to the reader that, to deal with the "truth" or "freedom" of folklore in Slovakia during the mentioned period.

According to the author, the book is the result of many years of research begun in 2010, and the final corrections of the manuscript were made in 2018. As he himself states, during the research, certain changes took place, so drastic that, looking back at the initial research, he got the impression that it was a completely different period of time. More precisely, the phenomenon that was the focus of his research still existed, but the political context of the phenomenon changed over time, which required additional research, the author points out. The book is an analysis of a folklore performance adapted to the liberal hegemony of a period often referred to as "post-socialism" or referred to as "post-Communism", which the author considers more appropriate. In the book's preface, Feinberg explains that the main categories of "self-understanding" of this new folklore, such as "authenticity", "people" or "people", were reformulated due to the general delegitimization of populism, nationalism and revolutionary romanticism after 1989. The author notes that the mentioned political tendencies never completely disappeared, but after the rule of the Communist Party, they found it in-

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creasingly difficult to articulate in public. Due to the party's great influence on many spheres of the public, the result was a rhetorical rejection of everything associated with "totalitarianism", including not only fascism and Stalinism, but also numerous other political tendencies associated with them.

During ten years of research conducted in Slovakia, the author saw the initiative of young folklore enthusiasts to convince the public that true folklore, authentic, is not related to populist, nationalist and revolutionary-romantic political ideologies, but that they discredited it because of the image placed in the public. Feinberg explains that the enthusiasts aimed to change that image of folklore and to point out that it should be viewed in the context of the "present" age. They claimed that, moving away from the mentioned discredited political tendencies, folklore became something completely different. What are those changes and what is it becoming? It is precisely these questions that Joseph Grimm Feinberg tries to answer in the book - the search for the course of these changes and the interpretation of the significance of these changes in society have emerged as the main goals of this book.

The author also points out that in reaching the mentioned goals, he does not represent the views in favor of folklore nationalism, nor their liberal critics, as he calls them "defenders" of folklore. He also explains that his goal in the research was not to discover "what is right" under the veil of political influence, but to map and analyze the way in which depoliticization itself became politically significant and changed the course of events. As the author himself states, this book is about "authenticity and inauthenticity, participation and performance, embodiment and representation, intimacy and publicity, and about clarifying the drama of depoliticization of politics that was important in the period of post-Communist liberalism in Slovakia". in the words of the author, in the period of research, the end is in sight.

In the section of the book called Introduction – The Dialectic of Authenticity, Feinberg explains the course of his field research. He started it in Bratislava, where he visited the so-called A "dance house" where people gather to learn traditional dances. Already during the first visit, the author came across a surprising statement by the respondents. In a conversation with a dance instructor, when asked if they could talk about dance, he received the following answer: "This is not what you are looking for" referring to the dances learned in the dance house, "(...) but this is it", pointing to a dance recording performances from the rural environment, which at that time were played on a white screen on the wall, which implied that he should continue his research in another, smaller, in the opinion of the narrator, more adequate environment.

He decided to conduct further research in the town of Košice in the eastern part of Slovakia, where he met with members of the Hornad Folklore Ensemble. The author, acquainted with the importance of participation during the research, participated in all the activities of the members of the ensemble, trying to draw certain conclusions through direct observation, but also from personal ex-

perience. It is this personal aspect that influenced the style of writing of the author, replacing the objective, scientific style, with a surprisingly subjective, in some instants, unexpectedly direct way of expression. The author very honestly, without hesitation, conveys to the reader his feelings, both positive and negative, shares with him his dilemmas and internal struggles. At the same time, a special challenge is to achieve objectivity, which the author achieves by supporting personal conclusions with data from a large number of professional bibliographic units of Slovak and authors from other countries, constantly plagued by struggling with his own emotions and striving to stay on the right, objective research path. In this case, Feinberg's surprising openness does not diminish the value of his research, but on the contrary, it further complements them and helps to obtain a broader, more complete picture of the phenomenon in the focus of research.

Feinberg categorizes and presents his research in several sections in the book. In the first section, entitled The Paradox of Folklore Publication, the author describes in detail the first few months of field research, focusing on "authentic" folklore from an outsider's perspective and how such folklore is marketed to the general public. The placement primarily refers to the activities within the "dance house" and the problems that enthusiasts encounter in practice. The problems are primarily related to organizing events for beginner dancers, without the presence of "performers and spectators". As the author finds out during the research, from conversations with the respondents, the purpose of the "dance house" is for folklore to "return" to where it belongs – among the people, the people. However, the author realizes that in practice, most dancers who come here are those with previously acquired dance experience in folklore ensembles of which they are members. As an amateur dancer, he was always in the minority, which further contributed to his subjective feeling of not belonging, an outsider, and this made it even more difficult for him to enjoy participating in a dance, because, as he notes, learning dances was not adapted to inexperienced dancers to keep up with the more experienced ones. He realizes that such feelings were shared by other frequenters without much dance experience, who, unfortunately, generally did not appear for the second time at such meetings. This raises the question – what is the purpose of dance houses, ie. returning folklore to the people, if it is not adapted to them and they actively, so to speak, do not participate in it? The author experiences the importance, but also the problem of presenting the activities of such dance houses in public. He cites an example where the organizers tried to "remove" folklore from the stage in every possible sense. Nevertheless, he notes that the most frequent participants in such events are people whose folklore experience is related to stage performance. This fact confirms the author's observation that when dancers are required to innovate and improvise, their skills in this field are mostly at an unenviable level. The author also states an interesting fact that at such dance events the dances of a certain locality are most often perfected, at no point does the aspiration, or at least the idea, of a certain standardiza-

tion or universalization of dance appear, which indicates the fact that at such meetings the elements are most often perfected, of certain choreographies, the author concludes.

The second section of the book, entitled Folklore as Performance and Organization, is dedicated by the author to his experience as a member of the Hornad ensemble. Here he takes the position of an insider and side by side with other, experienced members, monitors all their activities. He pays less attention to the public performance and presentation of folklore. The emphasis is on the demanding preparations that take place before the performance, on the organization of the action, but also on the moments of fun after hard work, which help the members of the ensemble to relax and get closer to each other. In this section, the subject of the author's observation is the way in which a common expressive culture can be shaped by specific models of social organization and social cohesion, which, as he says, may not always be visible during public performances, but ensemble members consider it crucial for their institution. According to the authors, these activities reveal competing conceptions of authenticity that stand side by side – the authenticity of the consistent presentation of folklore sources, which requires superior technical skills and long training, and the authenticity of "live" folklore to enjoy it in the company of friends, which they may experience when thinking about public performance is set aside and replaced by the enjoyment provided by socialization.

The importance of the subjective experience of folklore, the emotions it arouses in people, not only during the performance but also during its observation, Feinberg emphasizes in the third part of the book entitled Folklore and Festivals, between the Public and the People. Within this section, the author and members of the Hornad ensemble visit folklore festivals and analyze them as events and space. Here, he notices the ambiguity of intimacy and publicity, where the boundaries between public and private are debatable or exceeded, and where, thanks to this ambiguity, the contradiction of authenticity can be temporarily forgotten. Within this section, the author insightfully sees the specificity of the slogans of the Vihodna festival, which they presented as "a festival you will fall in love with". The author then notices the words folklore and love in the same sentence for the first time, which especially occupied his attention, as well as bringing folklore closer to the wider population with the words that folklore is "cool". As an outsider at festivals, the author notices tendencies to approach folklore visitors who are not active participants in folklore with this choice of words.

The Poetics of Authenticity is the title of the fourth part of the book in which the author presents an analysis of an old archival video performed by a proponent of authentic folklore, which is then reinterpreted based on this analysis. Feinberg analyzes their analysis, which enabled him to emphasize "poetics", that is, as the author calls it "authenticity". This helped him draw conclusions about how authenticity should be communicated to the public, whose public presence, on the other hand, jeopardizes authenticity itself. This information led the

author to reconsider the approach of the representatives of "authentic" folklore in the realization of their intentions.

In the section Coda, the author looks at resolving tensions between "authentic" and "non-authentic" dimensions of folklore, which he observes in the context of a historical moment in which, as he states, "hope for resolving these tensions is slowly disappearing, although it continues. it works, and in some moments it is only seemingly overcome". In this section, Feinberg explains that, analyzing the previously mentioned contradictions that a lover of authentic folklore encounters, he came to certain conclusions – authenticity can be performed on stage and does not have to be, which the author calls the "paradox of publishing folklore", folklore must be performed in order to be recognized by the public at all, but in order to be recognized as authentic, it must also be outside public performance; representational performance does not necessarily have to be the dominant means of conveying meaning, the medium itself can sometimes become a message; the social structures of participation can be as significant as any derived images.

At the end of the book, in the Final Non-Scientific Postscript, the author looks back at the entire research presented in the book, from a different angle. He returns to the previously mentioned issue of authenticity in the modern world in a somewhat speculative spirit, and suggests a more alternative way of thinking about authenticity. Feinberg concludes that something can be authentic only if it is unaware of its authenticity. It also raises the question of whether authenticity allows the one who seeks it to consciously perceive the problem of authenticity, which is constantly returning? The author also wonders, among other things, how one can react to an experience with inauthenticity when one knows that inauthenticity is part of the modern experience. One of the more interesting, philosophical ways of thinking of the author, which can certainly be an inspiration for further research and discussion, is that "maybe we as modern beings should give up the belief that folklore is hidden somewhere and start thinking in a way that folklore is simply this: the search for authenticity in a world where the past as such is the past. Maybe that aspiration to find authentic folklore is everything that ever existed as folklore, and folklore actually becomes that in the process of losing its authenticity."

As a conclusion to his philosophical thoughts, the author draws unexpectedly romantic conclusions. He points out that "love gives him hope for the survival of an enthusiastic search for authentic folklore." It is, as he states, an ideal that unites parties, performers, spectators, "defenders", participants, experts and amateurs. Feinberg optimistically concludes that "together they can search for authenticity, because that would be an authenticity that cannot be found in one individual soul, but only in community. Those who are in love with folklore may find their people (folk) and their lore (science) in that love." However, referring to his earlier claim, it can be concluded that the problem of authenticity is still present and that sometimes it is only seemingly overcome.

Translated by the author

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Passion & Devotion
Ljubiša Jovanović, flute
Belgrade, Metropolis
Music Company, 2020
ISBN 978-86-88017-73-2;
COBISS.SR-ID 15759625
[CD 1 – 75'; CD 2 – 76'][1]

> My approach to the work of Serbian composers is full of love, passion and commitment, and playing their music makes an important part of my life. My dealing with their work does not derive from a simple need of spending one's everyday life in one's own social milieu. Beyond that, it is a desire to search for esthetic and artistic nuances and shades of our great music. I can say with great joy and pride that this has been my intense preoccupation for the past more than forty years.
>
> Ljubiša Jovanović[2]

The quoted statement by Ljubiša Jovanović (1957) resolves idiosyncratic harmony with the title of the double audio compact-disc release *Passion & Devotion* published in 2020 by the Metropolis Music Company (Belgrade, Serbia),[3] featuring the flute works of Serbian composers performed by this renowned flutist and pedagogue, professor of the Faculty of Music, University of Arts in Belgrade. Likewise, these intimate and auto-poetical words sum up the perennial artistic effort of the interpreter, which, among other things, implies "passion" towards and "devotion" to Serbian flute music, or – in Miodrag Azanjac's (1932–1997) words – "Serbian flute art".[4]

Bravely following the path paved by his professor and director of the eminent Flute Choir – the source of inspiration for numerous domestic authors (Enriko Josif [1924–2003], Ivana Stefanović [1948], Ingeborg Bugarinović [1953], etc.) – as well as principles of the influential French flute school, Ljubiša Jovanović "committed" himself to contemporary Serbian music for the flute, thus establishing collaboration with a vast number of composers, commissioning and premiering their pieces and expanding the contemporary flute repertoire, moreover, to Ser-

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[2] Ljubiša Jovanović, flute, *Passion & Devotion* [double compact-disc], Belgrade, Metropolis Music Company, 107, 2020.

[3] The edition was supported by Sokoj – Serbian Music Authors' Organization.

[4] Миодраг Азањац, *Српска уметност флауте (фрула – флаута од искона)* (прире̄ђ. Зоран Рајичић), Чачак, Туристичка организација Чачка – Савет Сабора фрулаша Србије "Ој Мораво", 2018. [Miodrag Azanjac, *Serbian Flute Art (The Pipe – The Primordial Flute)*]

bian music *en général*, simultaneously playing the role of the flutist, pedagogue, conductor and organizer of the music festival *BUNT* (*Belgrade New Artistic Territory* [*Beogradska Umetnička Nova Teritorija*]).[5]

It was the Closing Ceremony of the *BUNT 6.0* festival, which was the birthplace of nine flute 'fantasies', authored by the same number of our composers. During his recital – or, better to say, grandiose venture[6] – called *Fantasies for solo flute* [*Fantazije za flautu solo*], which took place in Belgrade's Lola Hall on November 9th 2018, Ljubiša Jovanović performed for the first time Ivana Stefanović's *Canto*, Milan Mihajlović's (1945) *My melodies*, Zoran Erić's (1950) *Dedication to Nature* [*Posveta prirodi*], Jugoslav Bošnjak's (1954–2018) *Fantasy for solo flute* [*Fantazija za flautu solo*], Tatjana Milošević's (1970) *Carousel*, Svetlana Savić's (1971) *Fantasy in D* [*Fantazija in Re*], Milana Stojadinović-Milić's (1962) *A Little Cloud on Top of Mount Athos* [*Oblačić na vrhu Atosa*], Draško Adžić's (1979) *Study No. 5*, and Branka Popović's (1977) *The Beam*.

Creating the pieces commissioned by Ljubiša Jovanović for the aforementioned occasion was inseparable from the explicit or implicit dedication of compositions to the same performer, from the *fantasy* phenomenon (set before the composers in the form of a peculiar 'task'), as well as from the musical language of Telemann's (1681–1767) *Twelve Fantasias for Flute without Bass* (1732). Namely, the dramaturgical course of this concert represented the alternation between works by Serbian authors (the premieres were 'complemented' by the pinnacles of Serbian flute opus, such as Petar Konjović's [1883–1970] *La flûte de Pan* [*Satirova svirala*, 1945], Dejan Despić's [1930] *Partita* [1975], Dušan Radić's [1929–2010] *Improvisation* [*Improvizacija*, 1986], Enriko Josif's *Ballade* [*Balada*, 1970]) and Telemann's *Fantasias*. The recording of the performance of these compositions during the recital was the starting point of the first CD (recording and master: Dobrivoje Milijanović; producer: Ljubiša Jovanović) titled *Solo Flute* [*Flauta solo*], which, omitting the listed pieces by Konjović, Despić and Telemann, contains eleven solo flute works in total.[7]

The *Passion & Devotion* opens with *Canto* which, according to Ivana Stefanović's own words, represents "a 'retrospective' composition, in many ways", comprising allusions to Telemann's baroque motives and her works previously performed by Ljubiša Jovanović. These words are familiar to us thanks to the programme booklet, published in both Serbian and English (translated by Ranka Gašić), containing the biography of Lju-

[5] In 2017, Ljubiša Jovanović was awarded the "Aleksandar Pavlović" Award of the Composers' Association of Serbia, for his decade-long activity in promoting Serbian music.

[6] See: Марија Томић, "Слушај музику – чувај разум" [приказ фестивала *БУНТ 6.0*], *Политика*, 24. XI 2018, 37.729, CXV, додатак *Култура – уметност – наука*, 33, LXII, 6–7, 6. [Marija Tomić, "Listen to Music – Keep Your Mind" /review of the *BUNT 6.0* festival/]

[7] One should emphasize that *Study No. 5* by Adžić involves an electronics part, since it is a "study of the generative music for flute and electronics", as noted in the score.

biša Jovanović in addition to the remarkable notes on the works, mostly written by composers themselves, to which we will be referring throughout our text. *Canto* resumes the organic type of the flute – voice relationship, which is the source of inspiration for Ivana Stefanović's 'flute oeuvre'.[8] It is important to note that CD 1 closes with *Ballade* by Enriko Josif, whose favorite instrument was the very flute, to which he allocated his "singing narrations" ["pesmena govorenja"]. Thus, the circle from the first to the last track is completed, linking, in the most natural way, the courses of the following collaborations – Stefanović & Jovanović and Josif & Azanjac, already implying the fact that this edition was thoughtfully prepared in every sense.

And, in between – postmodern playing with citation techniques *par excellence*. For example, the work *My melodies* is a collection of several Mihajlović's themes from his various compositions, including 'Mozart[1756–1791]-like' *Eine kleine Trauermusik* [*Mala žalobna muzika*, 1990], played by Ljubiša Jovanović, among others, at its premiere performance, which makes this piece an important 'dedication' to the inspiring partnership. Melodic phrases and gestures from Telemann's *Fantasy No. 6* are recognizable in Bošnjak's *Fantasy*, "the last work" of the composer, persisting therefore as the historically significant trace of the author's final musical thoughts, as well as in *Carousel* by Tatjana Milošević, inspired by "mental conditions of vertigo, intoxication, abandon, panic, spasm, ecstasy, or voluptuous disorder – emotions triggered by ecstatic dances".

Three works listed on CD 1 are characterized thanks to the invocation of nature. In Erić's *Dedication*, composed after the *Natural History* of Pliny the Elder (23–79), it is praised "in all its manifestations". Special attention is also paid to the air/wind, as a source of the flute sound and one of the four natural elements. "In order to build a new nest" from the "flickering notes" of Telemann's *Fantasy No. 7*, Svetlana Savić incorporated in her *Fantasy in D* Nedeljko Terzić's (1949) poem *Tragic Play of Words* (*Tragična igra reči*, 2017), which the flutist recites/whispers along with playing. In the composition *A Little Cloud on Top of Mount Athos* by Milana Stojadinović-Milić, the wind is treated as a phenomenon that "keeps trying to 'banish' [from the top of the Mount Athos] the little cloud, a symbol of peace and quiet – but to no avail", which results in a specific dialogue of this piece with Telemann's *Fantasy No. 8*, distinguished by vocalization.

The first CD also contains Branka Popović's *The Beam*, an 'image' of "a ray of light that breaks through micro rifts, refracting and creating various shapes from lightness and darkness", Draško Adžić's *Study No. 5* as "a result of a software arrangement" of Telemann's *Fantasy No. 1* "reminding on popular fast dance electronic music" where the flute part brings a layer of quarter-tone melody, and Dušan Radić's *Improvisation* – created originally for flute and harp – whose "fluidity with no tonal center" illuminates "elusiveness of a filigree in its airy, lyrical

[8] See: Stanislava Vuksanović, *Flauta u srpskoj umetničkoj muzici*, Beograd, 1998, author manuscript, 14. [Stanislava Vuksanović, *The Flute in Serbian Art Music*]

flickering". Radić's *Improvisation* and Josif's *Ballade* form a peculiar epilogue of the CD 1, reviving the world of myth, due to the fantasy, improvisational, ballad, and monody principles, resembling, in that sense, Konjović's piece as well, which strongly resonates with *Syrinx* (1913) by Claude Debussy (1862–1918).

Another work by the same French author also 'sounds throughout' the second CD (master: Zoran Jerković; producer: Ljubiša Jovanović). Namely, *Prélude à l'avant-midi d'un faune* for flute and string orchestra [*Prelid za prepodne jednog fauna* za flautu i gudački orkestar] by Rajko Maksimović (1935), the most performed of all his instrumental compositions around the world, is a "paraphrase" of Debussy's well-known orchestral piece with the prominent flute part, composed in 1994, that is one century after the premiere of the *Prélude à l'après-midi d'un faune*. Accordingly, the CD 2 is 'reserved' for the flute accompanied by the (string) orchestra. In *Concerto sereno* for flute and string orchestra, Op. 110 [*Concerto sereno* za flautu i gudački orkestar op. 110, 1993] the academician Dejan Despić treats the flute in order to create "a musical image of serenity and light", bearing in mind "all its sound, dynamic and articulating capacities". The *Unusual scenes from Homer's grave in Smyrna – New additions to Hans Christian Andersen*, Op. 44, concerto for flute solo, piano, harpsichord, accordion, percussions, string orchestra and a narrator in nine scenes [*Neobične scene sa Homerovog groba u Smirni – novi prilozi za Hansa Kristijana Andersena* op. 44, koncert za flautu solo, klavir, čembalo, harmoniku, udaraljke, gudački orkestar i naratora u devet slika, 2005] by Ivana Stefanović is an interesting transposition of Andersen's (1805–1875) fairy tale *A Rose from Homer's Grave* (1842), whose main characters are a Rose, a Nightingale, and a Poet from the North, i.e. Andersen himself.

Zoran Erić's *Oberon concerto – Images of Chaos V* for flute and instrumental ensemble [*Oberon koncert – Slike haosa V* za flautu i instrumentalni ansambl, 1997) is based on "transforming the elementary (music) substance in time", during eight movements performed *attacca*; it is a matter of "stable chaos [...] a self-organizing system". The whole edition concludes, symbolically, with *Ljubiša's Flute Antiqua* [*Ljubišina flauta antika*], that is the first movement of Zoran Hristić's (1938–2019) *Six Belgrade concert images* [*Šest beogradskih koncertnih slika*], the "programmatic orchestral composition which in fact is the author's homage to geographic and historic 'sites of memory' in Belgrade, his birthplace, and to the artists with whom he, during his lifetime, had successful cooperation and created a bound of friendship", according to Zorica Premate. Thus, the framework of the second CD[9] be-

[9] In addition to the soloist, the second CD consists of performances by our prominent ensembles and orchestras, including the Belgrade Strings "Dušan Skovran", conductor: Aleksandar Pavlović (Track 1 – Maksimović), the "St. George Strings", conductor: Biljana Radovanović (Track 2 – Despić), the "St. George Strings" and the "Construction Site" Contemporary Music Ensemble, conductor: Biljana Radovanović (Tracks 3 and 4 – Stefanović and Erić), and the Radio Television of Serbia Symphonic Orchestra, conductor: Bojan Suđić (Track 5 – Hristić).

comes more than obvious – a Debussy-like beginning and an ancient-like ending bring us again to the origin of Pan's music, together with the fact that all tracks released on this edition were recorded during live performances.

Speaking about the *Passion & Devotion*, it seems that "passion" and "devotion" are two sides of the same coin. Inspired by the 'magic flute' of Ljubiša Jovanović, i.e. the passion engraved in every note he has played, our composers devoted their opuses to the flute, writing – in this case 16 – works particularly for this performer. In that regard, the playing of the mentioned works by Ljubiša Jovanović becomes exemplary, thus making the *Passion & Devotion* a point of reference for their further interpretation. To the stated intersection of different areas, which manifests multiple connotations of this edition, we add one more: creative/interpretative and pedagogical/enlightenment aims. Also, Jovanović's devotion to the every present moment, as the fundament of live performances, complies with his profound commitment to the duration/tradition/vocation. In the first place, it means an understanding of the language of authors from different generations, diverse poetics, styles, genres, and expressive states, although always with the same focal point – the flute idiom, even if the new sound dimensions were reached through the usage of the extended flute techniques. Besides the glorification of Jovanović's artistic endeavors, the *Passion & Devotion* is a tribute to contemporary (Serbian) flute art, as well as to Serbian music/heritage/history, which is why it represents a valuable contribution to music discography nowadays.

Translated by the author

The recordings took place in Belgrade – in the Sava Center Hall Atrium during the *International Review of Composers* in 1994 (Track 1), the National Museum Atrium during the 75th Anniversary of Dejan Despić's birth in 2005 (Track 2), the Hall of the National Bank of Serbia during the *International Review of Composers* in 2014 (Tracks 3 and 4), and the Ilija M. Kolarac Endowment during the same manifestation held in 2008 (Track 5).

DEFENDED DOCTORAL THESES

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Српско црквено појање у контексту руско-српских културних релација: *дуги XVIII век*

[Serbian Chant in the Context of Russo-Serbian Cultural Relations: *The Long XVIII Century*]**

The subject of this doctoral dissertation is the role that Russian, that is, Ukranian chant – the so-called Kievan chant – played in the formative process of Serbian church chant in the 18th century. The purpose of research undertaken for this dissertation was to determine the degree of connection between Ukrainian and Serbian church chants and to trace the routes – within the complex tangle of Russo-Serbian cultural relations in the 18th century – whereby elements of the Kievan chant found their way into the liturgical chant of the Serbian Orthodox Church. The relationship of these two chant traditions is first surveyed through the lens of Russo-Serbian cultural relations, and then also from the perspective of their musical links and kinships. Thus defined, the dissertation's thematic spectrum is addressed from a theoretical, historical, analytical, and interdisciplinary perspective.

The opening – introductory – chapter, mapping the main problem and methodological directions covered by the dissertation, also discusses the concept of 'the long 18th century', serving as the theoretical basis for establishing the disser-

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** The dissertation was written under the supervision of Dr Ivana Perković, full professor at the Faculty of Music of the University of Arts in Belgrade. The oral defence took place on 30 October 2020, before a committee comprising the following members, in addition to Dr Perković: Dr Marija Masnikosa, associate professor at the Faculty of Music; Dr Biljana Leković, assistant professor at the Faculty of Music; Dr Dragan Ašković, associate professor at the Faculty of Orthodox Theology of the University of Belgrade; and Dr Biljana Mandić, associate professor at the Faculty of Philology and Arts of the University of Kragujevac.

tation's research timeframe. Therefore, the dissertation covers "a more natural historical era than that of the standard calendar definition",[1] which is, in the context of Serbian history, the period between 1690 (the Great Migration) and 1804 (the First Serbian Uprising). In that sense, there is the following symbolic and significant parallel: 1804 was precisely the year when the students of the Clerical High School in Sremski Karlovci received their first grades in the subject titled "Church Chant".

The second chapter, under the title of "Serbian Chant and Russo-Serbian Cultural Relations until the End of the 18th Century", is focused on the historical and socio-cultural aspects of the Serb people's Russo-Slavic orientation in the 18th century, identifying the developments that indirectly or, by contrast, directly enabled the penetration of elements from the Kievan chant elements into the practice of Serbian church chant. Namely, due to the complexity of the political and religious position of the Serbs who settled in the territory of the Habsburg monarchy in 1690, facing the threat of assimilation and exposed to strong pressures from Catholic proselytising in the territories they inhabited, strengthening their ties with same-religion Russia was vital for preserving their national and religious identity, as well as restoring their existing and establishing new modes of cultural expression in the 18th century. Various impulses of cultural support for the Serb people came mostly from the south-eastern parts of the Russian Empire (today's Ukraine), whose population had experienced similar historical and socio-cultural circumstances almost a century before.

In the process of restoring the Serbs' spiritual life, establishing a system of schooling, and developing their literary culture, Russo-Serbian cultural ties conditioned the latter to rely on suitable models – the theological and the educational, then current in the Russian Empire's south-eastern parts, as well as on direct contacts with leading East-Slavic Christian Orthodox publishing hubs and their production. Accordingly, discussing the phenomenon of the prevalence of Russian books among the Serbs in the 18th century, the dissertation identifies the routes that Russo-Ukrainian Kievan Chant collections may have taken to reach the Serbs living in the Austrian Empire at the time. Copies made in the latter half of the 17th century and in the 18th century, with melodies fixed in Russian (i. e. Kievan) square notation which have been preserved in Serbian libraries, are viewed as evidence corroborating the initial hypothesis that the Serb population living in the Austrian Empire included individuals who were musically literate by the standards of their time and place and were consequently familiar with the chant tradition of the so-called Kievan school of music, whose elements they were able to weave into the emerging Serbian chant.

Indeed, it is precisely the schooling of Serbs at the Kyiv-Mohyla Academy, as an important factor that shaped the physiognomy of Serbian chant in multiple

[1] Frank O'Gorman, *The Long Eighteenth Century: British Political and Social History 1688–1832*, London, Oxford and New York, Bloomsbury Academic, 1997, xi.

ways, that receives significant attention in the third chapter, under the heading of 'Serbian Chant and Russo-Serbian Relations in Education during the 18th century'. It points out that learning liturgical chanting – the educational branch, formulated at the end of the 18th century as the so-called Notational Irmologic Class – formed a significant part of the study programme in Music and thereby also an important segment of the curriculum in the *Seven Liberal Arts,* which formed the bedrock of the system of education pursued at the Kievan school, and, moreover, that the Academy's students were successful in mastering the contemporary chant tradition of south-eastern Russia in two modes, both of which had equal representation in the teaching process. On the one hand, chanting was taught orally, in the church choirs of the city of Kiev, and, on the other hand, by using melodies written down in Russian square notation and collected in irmologions, specifically Ukrainian chant collections with mixed contents, whose practical usage entailed a certain level of training in music theory. That is how the Serb alumni of the Kyiv-Mohyla Academy, having mastered the chant repertory of southeast Russia in the ways described above, could enhance, upon returning to their homeland, the impact of certain elements of the Kievan chant on Serbian church melodies, on the one hand through liturgical practice and, on the other hand, by putting their newly acquired mastery of chant in the service of enlightening the youth of their native country.

Scientifically relevant and well-argued evidence supporting the hypothesis that Kievan chants played a significant role in shaping the physiognomy of Serbian chant melodies is presented in the fourth chapter, under the title of "Serbian Chant and Russo-Serbian Relations in the 18th Century: The Musical Aspect". It establishes numerous analogies regarding specific musical traits of both chant traditions, referring to groups of less melismatic melodies in Serbian and Kievan chant. The influence of Kievan church melodies on Serbian liturgical chants took shape in the formal sphere – in macro- and micro-formal terms – as well as on the level of Serbian chant's musical substance itself. Above all, the Kievan chant provided a suitable structural basis for synthesising the elements that gave rise to Serbian chant – not only its Russian church-chanting heritage, but also its late-Byzantine music tradition, as well as Serbian folk chant.

The dissertation comprises a total of 384 pages, with 17 notated examples, 22 reproductions, and 50 tables (in the main body of the text and in an extensive appendix). The bibliography section comprises 350 units in Serbian, Russian, Ukrainian, and English, with seven sources from the Worldwide Web, and ten primary sources – chant collections of Russo-Ukrainian provenance.

Translated by Žarko Cvejić

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