

**MUZIKOS
KOMPONAVIMO
PRINCIPAI:**

teleologijos
fenomenas

**PRINCIPLES
OF MUSIC
COMPOSING:**

Phenomenon
of Teleology

XX

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Pratarmė

Ši mokslinių straipsnių rinktinė – tai periodinis leidinys, skirtas kelti, tyrinėti ir suprasti aktualius muzikos komponavimo klausimus. *Muzikos komponavimo principų* 20-ojo leidinio tema – „Teleologijos fenomenas“. Pastaruoju terminu paprastai įvardijamas kompozicinio proceso tikslingumas (gr. *telos* – tikslas), sudarantis sąlygas užbaigti ir subalansuoti muzikinę formą. Minėtas fenomenas europinėje muzikoje aktualizuojasi drauge su tonalios muzikos evoliucijos etapu ir komplikuojasi jam baigiantis. Šiame leidinio tome tyrinėjami įvairūs šiuolaikinės muzikos teleologijos fenomeno iššūkiai. Leidiniui savo idėjas pristatė kompozitoriai ir muzikologai iš įvairių šalių: Ispanijos, Jungtinės Karalystės, Serbijos, JAV, Kanados, Lenkijos, Lietuvos.

Straipsnius žurnalui mokslinis komitetas atrenka remdamasis trimis pagrindiniais kriterijais: a) straipsniams taikomi aukščiausios kokybės standartai; b) autorių pasirinktos temos turi atitikti konkretaus tomo temą; c) atsižvelgiama į sąsają su konkrečia leidinio dedikacija. Kad straipsnis būtų publikuojamas, jis turi atitikti bent du kriterijus.

Visi straipsniai sugrupuoti į tris aktualias nagrinėjamos temos potemes.

I potemė: Teoriniai teleologijos aspektai. Čia keliami ir tyrinėjami aktualūs komponavimo teorijos ir tarpdisciplininio pobūdžio klausimai bei iššūkiai.

Miłoszui Zatkalikui priimtini muzikinės teleologijos sugretinimai su pasaulėvaizdžio fenomenais (filosofiniais, moksliniais). Mokslininkas muzikos teleologijos procesą lygina su Newtono mechanikos dėsniais ir klasikine termodinamika bei apmąsto šias sąsajas Deleuze'o, Leibnizo ir Spinozos filosofinių idėjų kontekstuose. Zatkalikas veikusiai neatsitiktinai išreiškia fundamentalią mintį – šiuolaikiniai muzikos viršmuzikiniai principai šiandien nebeprodukuoja autonomiškų pasaulėvaizdinių-teleologinių analogijų (metaforų, modelių), bet kaskart naujai ir netikėtai atveria savo potencialus.

Iš esmės, regis, nesuklysimė tardami, kad tonalioje muzikoje teleologiją formuojantis naratyvas yra tiesiogiai priklausomas nuo harmoninio plano. Kaip pažymi Rogeris Redgate'as, sugriuvus tonaliai sistemai, teleologinio naratyvo pamatu tapo formaliosios struktūros, iš pradžių atvedusios kompozitorius prie serijinės technikos, o vėliau – ir prie kur kas sudėtingesnių, tiek turinį, tiek formą valdančių, formalijų struktūrų. Autorius aptaria šią naują struktūrų hierarchinę sistemą, jos įtaką naujų muzikos klausymo bei naratyvinio numatymo (angl. *expectations*) įgūdžių formavimuisi kartu su šių aspektų poveikiu jo paties komponavimo procesui. Artikuliuojamas medžiagos funkcijas (harmonines, linearines, faktūrines, formas) R. Redgate'as iliustruoja A. Weberno, P. Boulezo, B. Ferneyhough'o bei savo paties kompozicijomis.

Jimme'as LeBlancas muzikinės formos ir teleologijos santykį imasi spręsti pasitelkdamas Deleuze'o materialistinės ontologijos (virtualumo ir aktualumo) principus. Autorius nagrinėja, kaip šie principai gali padėti iš naujo pažvelgti į teleologiją, aptaria galimus teleologinius ryšius tarp virtualumo ir aktualumo bei kaip šie ryšiai formuoja mūsų požiūrį į muzikos formą. Regis, amžinųjų ontologinių sandų santykis autoriui yra priimtinas aiškinant teleologinius fenomenus ne tik jo analizuojamos klasikinės sonatos (Beethoveno Sonata smuikui ir fortepijonui Nr. 9, op. 47), bet ir šiuolaikinės muzikos atžvilgiu.

Muzikinė teleologija, Edsono Zampronha'os nuomone, yra ne muzikos kūrinys (nei natų tekstas – R. J.), o klausytojo sąmonė, transformuojanti tai, ką girdi, į tai, kas yra suprantama (angl. *intelligible*). Būtent – panašumas, kryptingumas, supaprastinimas (redukcija), autoriaus manymu, įreikšmina supratimo proceso ypatumus, kurie yra esminiai tyrinėjant tiek tradicinę, tiek naująją muziką. Autoriaus pozicija skatina mąstyti apie teleologijos fenomeną pirmiausia kaip apie vertybinį kompozitoriaus pasirinkimą dar iki skambesio.

II potemė: Teleologiniai projektai šiuolaikinėje muzikoje. Šios potemės straipsniai pirmiausia iliustruoja teleologinio fenomeno pokyčius, susijusius su tonalios sistemos decentralizacija bei daline jos eliminacija.

Agata Krawczyk, gretindama Hannos Kulenty Simfonijas Nr. 1 ir Nr. 3, įvardija principinius šių dviejų kūrinių teleologinių projektų skirtumus: pirmajam būdingesnė kompozicija kaip dinaminis procesas, antrajam – transinė (repetityvinė) būseną. Vis dėlto šie teleologiniai skirtumai, pasak autorės, nesudaro opozicijos ir veikiau yra vieno bendro teleologinio spektro dalys.

Žanrinių kanonų (genotipų), pasižyminčių tradiciniais teleologijos modeliais, santykiai su dvylikagarse technika (tiek serijine, tiek neserijine), yra Gražinos Daunoravičienės akiratyje. Muzikologė tyrinėja iškiliausius lietuvių kompozitoriaus Eduardo Balsio kūrinius (simfonią-koncertą „Dramatinės freskos“, oratoriją „Nelieskite mėlynojo gaublio“, operą „Kelionė į Tilžę“). Autorė atskleidžia Balsio kūrybai būdingą sunkiai išsprendžiamą kontradikciją „genotipinis kanonas *versus* dvylikatonė technika“, palikdama erdvės individualioms skaitytojų interpretacijoms.

Svetlana Barkauskas, pristatydamą Vytauto Barkausko Kvintetą styginių kvartetui ir fortepijonui, pastebi: kompozitorius, neatsisakydamas esminių tonalių funkcijų, panaudoja kone visas jam žinomas komponavimo technikas. Regis, pastaroji aplinkybė nulėmė komplementarios teleologinio naratyvo raidos poreikį. Be pozicionuojamo tonalumo, kompozitorius panaudoja nuolatinę registrinio, tembrinio ir dinamikos veiksnio plėtotę – kylama nuo žemųjų styginių iki fortepijono aukščiausio registro *al niente*. Pastarąjį teleologinį fenomeną autorė sieja su programine kūrinio idėja.

Rimantas Janeliauskas, pratęsdamas tembrinės faktūros tyrinėjimus (žr. *Muzikos komponavimo principai*, XIX), toliau plėtoja teleologinio dinamizavimo aspektus, neatsiejamus nuo tembrinės faktūros archetipų (antifoninio, responsorinio, heterofoninio, burdoninio). Tyrimas orientuotas į tembrinės faktūros dinamizavimo procesus, paskatinusius įsitvirtinti naują audijavimo būdą, kuris netrukus kardinaliai transformavo kompozitoriaus santykį su skambesiu – iš tonalaus į tembrinį. Straipsnyje keliamos idėjos iliustruojamos XX a. kompozitorių kūrinių ištraukomis.

Vytautas Germanavičius savo kūrinyje *Bloomy Ice* styginių orkestrui pasitelkia lietuvių etninei muzikai būdingas mikrotoniškai varijuojančias intervalų skales. Pastarosiomis grindžiamas kūrinio skambesio profilis, neatsisakant nei tikslingo teleologinio procesualumo, nei formos pusiausvyros.

III potėmė: Teleologinės alternatyvos anapus naratyvo. Čia straipsnių autoriai kreipia mintį į *tikimybinį* (nedeterminuotą) arba, priešingai, – *totaliai programuojamą* (determinuotą) teleologinį procesą.

Martinus Vishnickas, aptardamas instrumentinę improvizaciją, iškelia tikimybinio naratyvo potencialą perprasminti morfologinio skambesio pavidalą ir pakeisti jo teleologines potencialias, atkeliaujančias iš determinuotos teleologinės praktikos.

Thomasas Metcalfas pristato grafinę erdvę kaip metaforinį muzikinės teleologijos stimulą bei funkciją. Autorius analizuoja pikseliaciją, kurią įvairiais būdais pritaiko savo kompozicijose teleologinėms strategijoms formuoti. Pravartu pažymėti, kad teleologiškai orientuotos grafinės erdvės ir muzikos tarpusavio santykis, regis, yra indeterminacinio pobūdžio.

Rima Povilionienė, pristatydamą mikrodimensinio *glissando* apraiškas lietuvių kompozitorių kūriniuose, analizuoja Šarūno Nako, Justės Janulytės ir Ryčio Mažulio partitūras, kuriose *glissando* yra naudojamas ne kaip pavienis elementas, bet kaip komponavimo technika. Čia ypač aktuali yra Ryčio Mažulio kompozicija *Solipse* 31 garso takeliui ir violončelei, kuriame atlikėjas tampa tarsi kompiuterinio proceso dalimi. Smalsu būtų sugretinti šitai konstruojamus „naratyvinius“ ypatumus su istoriškai nutolusia, mechanistine barokinių muzikos automatų idėja.

Leidinyje papildytas **Priedu**, kuriame Nico Schülleris įžvelgia universalesnį teleologijos principų pritaikymą begalinėje muzikos analizės metodikų pasiūlos erdvėje. Autorius pristato Wernerio Stegmaierio „Orientacijos filosofiją“ ir aptaria jos svarbą tiek muzikos analizės, tiek bet kurioje kitoje mokslinių tyrimų srityje. Orientacinis procesas, autoriaus nuomone, padeda tyrėjui ne tik nepasiklysti analizės metodikų aibėse, bet ir tinkamai pasirinkti tyrimo objektus, hipotezes, tikslus ir t. t. Įdomu yra tai, jog autorius labiau orientuojasi ne į kūrinio, bet į pačios analizės teleologiją.

Baigdami apžvalgą pažymėsime, kad leidinio straipsniai gali būti diferencijuojami pagal pakraipą – mokslinę teorinę ir praktinę. Ir nors absoliučių ribų nėra, vienus straipsnius sąlygiškai galima išskirti kaip vertingesnius moksliniu teoriniu požiūriu (M. Zatkalis, R. Redgate, J. LeBlanc, E. Zampranha, G. Daunoravičienė, R. Janeliauskas, R. Povilionienė), kitus – praktiniu (A. Krawczyk, S. Barkauskas, V. Germanavičius, M. Vishnick, T. Metcalf). Vertingos idėjos atskleidžiamos ir leidinio priede (N. Schüller).

Dėl pandemijos šis žurnalo numeris išeina kiek vėliau nei įprasta, todėl straipsnių autoriams buvo suteikta galimybė atnaujinti savo tyrimus 2021 metų duomenimis.

Tikimės, kad 20-asis *Muzikos komponavimo principų* tomas sulauks skaitytojų dėmesio ir bus įdomus kiekvienam besidominčiam teleologijos fenomeno problemomis. Redakcinė kolegija tikisi skaitytojų dėmesio tiek čia, Lietuvoje, tiek užsienyje. Būsime dėkingi už visas pastabas ir atsiliepimus apie leidinį. Organizatorių vardu dėkojame visiems rengėjams ir rėmėjams.

Prof. dr. Rimantas Janeliauskas

Foreword

This collection of scholarly articles is a periodical aimed at raising, researching, and comprehending fundamental questions of music composing. The 20th volume of *Principles of Music Composing* is focused on the subject of teleology. This term usually expresses the purposefulness of the compositional process (gr. *τέλος*—purpose). The phenomenon of teleology reaches the peak of its actualization alongside the stage of evolution of tonal music and turns into a complicated stated along its demise. In this volume, a number of scholars address various teleological challenges of contemporary music. Authors from Canada, Lithuania, Poland, Serbia, Spain, UK, and USA have contributed to this publication.

Selection of articles relies on the three basic criteria: (a) only papers of the highest quality show up in the journal; (b) individual topics must correspond to the overall subject of the particular issue; (c) authors address a dedication of a volume. At least two of the listed criteria have to be met in order to qualify for publication.

The articles of the collection are divided into three important subthemes.

Subtheme I: Theoretical Aspects of Teleology. Here the authors discuss the relevant theoretical and interdisciplinary questions and challenges of composition. Miloš Zatkalik juxtaposes musical teleology with phenomena of worldview (philosophical, scientific). The scholar compares the process of teleology with the Newton's laws and classical thermodynamics, and rethinks these connections in the light of philosophical ideas of Deleuze, Leibniz and Spinoza. Zatkalik expresses a fundamental idea: contemporary "extramusical" principles in contemporary music no longer produce autonomous analogies of worldview (metaphors, models), but are constantly folding, unfolding, refolding their potentials.

It is reasonable to assert that the narrative that shapes teleology in tonal music is directly dependent on the harmonic plan. According to the observations by Roger Redgate, after the demise of the tonal system, harmonic plan was replaced by the formal structures that initially led the composers towards serial technique and later—to much more complicated structures, that not only govern the material, but form as well. The author discusses this hierarchical system of formal structures, its influence on the new approaches on the process of listening and the process of composition. Redgate illustrates these new approaches with the examples by Webern, Boulez, Ferneyhough and himself.

Jimmie LeBlanc approaches the relationship between teleology and musical form from a perspective of Deleuzian materialist ontology. The author investigates how the two main principles (*the virtual* and *the actual*) can lead us to a different approach to teleology, he discusses the possible teleological relations between *the virtual* and *the actual*, and how they affect our understanding of musical form. It seems that eternal ontological components serve the author as an easily operable tool to explain the teleological phenomena that are far beyond his choice of a classical sonata (Beethoven's Sonata for violin and piano No. 9, Op. 47), but stretches into the realms of contemporary music.

According to Edson Zampronha, teleology of music is not a musical piece itself (nor is the musical text, R. J.), it happens in the mind of the listener. The mind transforms what it hears into what is intelligible, according to the ideas of similarity, directionality, and reduction. The author asserts that these three ideas epitomize the process of understanding, which is a key for analyzing the teleology of both classical and contemporary music. Zampronha's position provokes us to think about teleology as a worldview phenomenon, a composer's choice that happens prior to any sonic event.

Subtheme II: Teleological projects in contemporary music. The papers in this chapter illustrate the changes of the phenomena of teleology, which are attributed to the decentralization and demise of the tonal system. Agata Krawczyk juxtaposes two symphonies by Hanna Kulenty: No. 1 and No. 3. By doing this, she defines the key difference between the teleological projects of the two: the former features a dynamic process of events, while the latter presents a trance-like repetitive state. However, these teleological differences, according to the author, do not form a binary opposition, but rather function within a single spectrum of teleological approaches.

Canon approaches to music genres (genotypes), which carry traditional models of teleology, and their exposition to the twelve-tone technique (both serialist and non-serialist approaches), are in Gražina Daunoravičienė's scope. The musicologist examines the most prolific compositions by Lithuanian Composer Eduardas Balsys (Symphony-concerto "Dramatic Frescoes", oratory "Don't Touch the Blue Globe", opera "Journey to Tilsit"). After a thorough research, the author unravels a very characteristic trait of Balsys' works: a hard-to-solve contradiction between "genotypic canon" and twelve-tone technique, which is left open to the individual interpretations.

Svetlana Barkauskas presents the piano quintet by Vytautas Barkauskas and discusses the way that the composer managed to employ a plethora of traditional and modern composing techniques, without renouncing the essential tonal functions. It seems that this particular circumstance evoked the need of complementary manifestation of teleological narrative. Tonal factor aside, the composer employs a constant development of the register, timbre and dynamics, as the entire structure of the piece is based on an ascension from the low strings to the highest register of piano *al niente*. The author of this paper attributes this teleological approach to the program idea of the composition.

Rimantas Janeliauskas continues his researches of timbral texture (see *Principles of Music Composing*, XIX). He further elaborates on the idea of teleological dynamization, which is integral with the archetypes of timbral texture (antiphonal, responsorial, heterophonic, and bourdon). The research is oriented towards the processes of dynamization of timbral texture, which stimulated the establishment of a new approach to audition. This new approach significantly transformed the composer's relation with the sound, namely from pitch-oriented to timbre-oriented relation. The ideas presented in the article are illustrated with the excerpts from compositions by the composers of the 20th century.

For his composition for the string orchestra *Bloomy Ice*, Vytautas Germanavičius uses scales with micro-tonal variations, which are characteristic to Lithuanian ethnic music. These scales define the soundscape of the composition without sacrificing neither the purpose-driven processuality, nor the equilibrium of musical form.

Subtheme III: Teleological alternatives beyond the narrative. Here the authors address the *probabilistic* (undetermined), or, in contrary, the *totally programmed* (determined) approaches to teleological process.

Martin Vishnick discusses instrumental improvisation and points out the potential of the probabilistic approach to redefine the sound profile of a morphology, and alter its teleological potencies that are carried from the determined approach to teleology.

Thomas Metcalf presents graphical space as a metaphoric stimulus for musical teleology. Author discusses the phenomenon of pixelation, which he employs in his own compositions in a variety of ways, in order to construct the teleological strategies. It is worth mentioning that the relationship between music and teleologically oriented graphical space seems to be of an undeterministic nature.

Rima Povilionienė presents the manifestations of multidimensional *glissando* in the works of Lithuanian composers. She analyzes works by Šarūnas Nakas, Justė Janulytė and Rytis Mažulis, where *glissando* is used not as a singular element of the texture, but as a compositional technique. Here the composition *Solipse* for cello and 31 sound tracks by Rytis Mažulis stands out, where the performer becomes a part of a computer-like process. It would be curious to juxtapose the particularities of such "narrative" with a historically distant idea of Baroque music automatons.

The main chapters are followed by a **supplement**, in which Nico Schöler presents a more universal adaptation of principles of teleology in a seemingly infinite space of methodologies of music analysis. The author advocates the adaptation of Werner Stegmaier's *Orientation philosophy* and discusses its importance not only in the field of musical analysis, but in all research areas. According to Schöler, the process of orientation not only allows the scholar not to get lost in a plethora of methodologies, but also leads to better selections of research objects, hypotheses, goals, etc. It is particularly interesting that Schöler is more concerned about the teleology of analysis itself, rather than the teleology of a musical piece.

We would like to conclude this brief introduction with an observation that the papers in this issue can be differentiated into two main categories. Even though no clear boundaries can be set, we can discern the articles that outstand in their theoretical value (M. Zatkalik, R. Redgate, J. LeBlanc, E. Zamprinha, G. Daunoravičienė, R. Janeliauskas) and the ones that shine with their practical (artistic) insights (A. Krawczyk, S. Barkauskas, V. Germanavičius, M. Vishnick, T. Metcalf). Valuable ideas are also presented in the supplement (N. Schöler).

Due to the pandemic, this issue of the magazine comes out a little later than usual. Therefore, the authors of the articles were given an opportunity to update their research with data from 2021.

We hope that the 20th volume of *Principles of Music Composing* will attract attention around the world of those who are interested in the problems of musical teleology. All comments and criticism are welcome. On behalf of the editors, I thank all who contributed to the preparation and publication of this issue.

Prof. Dr. Rimantas Janeliauskas
Translated by Dr. Andrius Maslekovas

1

TEORINIAI	THEORETICAL
TEOLOGIJOS	ASPECTS OF
ASPEKTAI	TELEOLOGY

Musical Teleology between Newton, Prigogine and Deleuze (with Spinoza Becoming Musical)

Abstract. The concept of *τέλος* (end, purpose) is deeply rooted in European thought, with rich and diverse applicability (ethical, metaphysics, religious). In music, given its temporal and processual nature, teleological issues enjoy a privileged position. Whenever we experience or think about music as a process, we can inquire about the goals of that process, and the paths leading toward these goals. In my previous work on musical teleology, I discussed the types of events that serve as goals, the activity of musical parameters that project goals and steer music toward these goals, and the conditions under which music can be deemed teleological. In the present article, I try to examine teleology in light of ideas that have largely shaped European thought over the past several centuries, particularly ideas that come from “natural philosophy” and the philosophy of science. I will examine, first, the implications of Newton’s (and Spinoza’s) non-teleological, mechanistic determinism; I will proceed with the arrow of time postulated by the highly teleological second law of thermodynamics, as well as the self-organizing, far-from-equilibrium dynamic systems studied by Ilya Prigogine; and finally, the probabilistic aspect introduced by quantum mechanics. My music examples will be from the compositions by Penderecki, Ligeti, and Varèse. While recognizing the autonomy of the respective scientific, philosophical, and artistic fields, we cannot fail to notice that certain ideas at a certain period seem to proliferate and circulate between different fields and that works of art have a way of expressing the same relationships as do phenomena in the both inanimate and animate world, including moving toward a goal/end. This brings us to the idea of univocity as championed by thinkers such as Spinoza and Gilles Deleuze.

Keywords: Newton, Spinoza, Leibniz, Deleuze, Ligeti, Penderecki, Varèse, musical teleology.

1. Prologue

When Krzysztof Penderecki ended his *Polymorphia* for strings with a C major chord, he created a double paradox. What could be a more natural ending in Western European music than a C major, and what could be *less* natural than a C major in this piece? The second and more important paradox is: when you think it over, what could be a more effective ending? At every point in this composition, you could think of a plausible continuation. The C major, unexpected, incongruent as it is, could not have been more definitive. There is simply nothing you can add afterward.

Our next example will be György Ligeti’s *Lux aeterna* for sixteen a cappella voices. Table 1 presents the synopsis of form, indicating pitch collections occurring at structural boundaries.

Section	I				II				III			
Subsection	I ₁		I ₂		II ₁		II ₂		III ₁		III ₂	
(begin/end)	0	24	24	37	37	61	61	90	90	(101)	(101)	119/127
Pitch/pc	F→013	(025)	(A)	013→A	025	025	025	025	037	025	025	0257 →F+G
Texture	canonic				non-canonic	canonic		non-canonic	canonic		non-canonic	

Table 1. György Ligeti, *Lux aeterna*, synopsis of form

There is no a priori reason why should the first section end with the trichord F_♯–A–B,¹ belonging to the set class 025.² Yet, when this pitch collection reappears, we not only recognize its concluding function—confirmed in subsequent sections and subsection as the table shows—but we also feel that it somehow issues naturally from the preceding music flow. Whether or not the previous events point precisely to that event is open to debate. I believe they do, up to a point, and in my previous article (Zatkalik 2013), I demonstrated something I called the rise to power of the 025-pitch collection. What I mean by that expression is how this set gradually becomes increasingly prominent until it assumes a pivotal structural role. It remains questionable, though, to what extent this process is accessible to listeners.

¹ See Example 3a below. For technical reasons I do not provide other examples of this piece. The reader is strongly advised to have the score at hand.

² It would be meaningless to conduct a set-theoretical analysis of this composition, but the Forte labels are the most convenient way of highlighting the common traits of boundary-marking pitch collections.

The end of the entire piece, with its fading out, its total exhaustion of energy feels appropriate, its finality undisputable. The music naturally leads toward such an ending—naturally, but not inevitably. It does not feel like the necessary outcome of the process, the way the perfect authentic cadence does in tonal music. Consider the cadence of virtually any musical sentence in the late eighteenth and roughly the first half of the nineteenth centuries: a sonata theme, the first section of a ternary form and the like. An utterly different ending is conceivable in Ligeti, but not there.

In these examples and music generally, some goals are expected and given a priori, some are created contextually. We, furthermore, ought to distinguish between goals themselves and paths leading toward them. The two aspects can work in tandem, but they can also diverge, be completely divorced from one another, or one of them can be absent. In *Polymorphia*, we can tentatively speak of a goal, but not even tentatively about paths toward that goal. We also need to be aware of the possible discrepancy between the compositional procedures and listeners' experience. Analysis can sometimes disclose procedures that remain hidden from the listener: "polyphony is written, harmony is heard", as Ligeti famously said.

2. Preliminary considerations

The concept of *τέλος* (end, purpose) is deeply rooted in European thought, with rich and diverse applicability (ethical, metaphysical, religious). Every investigation of motion may legitimately pose the question of where the motion is headed. The well-known cognitive schema source–path–goal, very influential in music, is teleology in a nutshell. A narrative structure is teleological. When we talk about tension and release, we are talking about something we can call prototeleology: namely, a process heading toward a goal can be described as moving from a less stable, hence more tense state toward a state of stability, with the concomitant discharge of tension. If this is true, then Freud's structural model of the mind reflects various aspects of teleology. The goal of the unconscious Id is the immediate discharge of tension; I will call this microteleology, moment-to-moment connections. Ego introduces delay: the goal (discharge of tension) is deferred, taking into account reality (one's limitations, for instance), or—with Superego—taking into account norms, conventions, or prohibitions imposed by society.

In music, given its temporal and processual nature, teleological issues enjoy a privileged position. Virtually every aspect of music can have its teleological dimension, and so can virtually every approach to music. Whenever we experience or think about music as a process, a flow, we can inquire about where this process leads to and by which routes. This can ramify into myriads of more specific questions, such as the forces that propel the flow of music towards goals (Larson 2012); various temporalities in music (Kramer 1988); the activities of individual parameters (harmony, counterpoint, form) in projecting and attaining goals; expectations and their fulfillment (Huron 2006), and more. In my previous work on musical teleology (Zatkalik 2013), I discussed the types of events that serve as goals, the activity of musical parameters that project goals, and steer music toward these goals and conditions under which music can be deemed teleological. I also insisted, first, that teleology is not the question of binary choice but of degree: processes can be more or less goal-oriented. Second, a composition is not, or not only teleological in itself; teleology is or is also a way of listening. Teleology is in the ear of the listener.

The "technical" perspective of my previous work will now be broadened and deepened as I try to examine teleology in light of ideas that have largely shaped European thought over the past several centuries. I particularly want to explore relations between musical teleology and how science made sense of the world, first as natural philosophy, later as a philosophy of science. I will examine the implications of Newtonian mechanics, which is deterministic and reversible; of quantum physics, which basically follows the same postulates but adds the aspect of probability. As opposed to that, classical thermodynamics is teleological and irreversible, postulating a unidirectional arrow of time. Possibly the most relevant model for post-tonal music are self-organizing, far-from-equilibrium dynamic systems, studied by the Nobel-prize-winning Russian-Belgian chemist Ilya Prigogine (Prigogine & Stengers 1984). From that vantage, the goals of musical motion act in a way similar to attractors in dynamic systems, as we will explain in due time.

I certainly do not propose a one-to-one mapping between philosophy, science and arts. I am not advocating some mystical *Zeitgeist* that permeates all intellectual, artistic and spiritual products at a given historical time. Still, certain ideas at a certain period seem to proliferate and circulate between different fields. One finds parallels or isomorphism between different areas. These relationships can be regarded in various ways. Thus,

a philosophical system or a scientific theory can trigger something in an artistic field, both directly and indirectly. What exactly the reaction will be, what kind of artistic product this would yield, cannot be specified: the autonomy of artistic creation is responsible for that. This is something like “structural coupling”: the idea originating with Chilean biologists Humberto Maturana and Francisco Varela (1980), meant for biology but used in social sciences, notably by Niklas Luhmann. We can also think with Mikhail Bakhtin about mutual answerability of art and life. Or in the direction of Whitehead’s speculative philosophy as “the endeavor to frame a coherent, logical, necessary system of general ideas in terms of which *every element of our experience* [emphasis mine] can be interpreted” (Whitehead 1978/1929: 3). Or with Deleuze discover the same abstract machine operating in different domains, enabling us to experience the creative power that produces a composition consubstantial with physical forces.

My previous work (Zatkalik 2013; 2015; 2017) discussed musical teleology chiefly in terms of activities of musical parameters. A great deal has been written on teleology in general, the ontology and metaphysics of goal-oriented processes. We need to make a distinction between two fundamental approaches to the concept of goal, going back to Plato and Aristotle. Very briefly, it is the transcendent versus the immanent. The Platonic view sets the goals outside, “beyond the existing material substrate”. Aristotle, however, invested nature itself with goals. Entities are so constructed that they tend to realize this goal; “final causes are metaphysically immanent in nature ... intrinsically directed toward their appropriate ends” (McDonough 2009: 520).

How does this distinction apply to music? We can think on two levels. On a more superficial one, it partly matches the already indicated distinction between goals established by referring to an a priori referential system—chiefly functional tonality—and goals created contextually, emerging from the intrinsic logic of the piece. I would, however, rather think of this issue on a more fundamental level, as a kind of metaphysical underpinning related to the phenomenon of music as such, and how it is constituted as teleological: on what conditions it can be deemed teleological, what kinds of goals it strives to achieve, are the goals inherent in music and so on. It then serves as a basis or a framework for the inquiry into the nature of specific paths and goals in a composition. On the one level, the distinction concerns the activities of musical parameters; on the other, the way we think about music.

A more complex analysis of phenomena commonly discussed under the rubric of teleology delimits several types of processes. It is open to debate, however, whether some of them can be properly considered teleological. Thus, Ernst Mayr (1992) proposes a taxonomy according to which some types of processes can only loosely be identified with teleology.

- *Telematic*, when the end is automatically achieved, as in the law of gravity, the second law of thermodynamics and other processes in the inanimate world. Such processes come to an end when their potential is used up, or when stopped by an external impediment (e.g. a falling object hits the ground).
- *Teleonomic*, when there is coded and prearranged information that governs a certain process/behavior toward a specific outcome: birds are genetically programmed to migrate; a computer is programmed to perform a certain task.
- *Adaptation* by natural selection.³

Natural processes tending toward a final state could be called end-oriented rather than goal-oriented—finious as Charles Sanders Peirce says. It follows that teleology proper must include intentionality, intentionality being taken both in the technical sense of “aboutness”, that is, the property of the mind of being about something or directed toward something and in the everyday sense of having an intention or a purpose. Authors like Mayr and Nagel talk about phenomena rather different from music. But in music, what do we mean—in light of the above—when we talk about goals and their achievement, or the endpoints and paths leading toward them? Are these processes like a stone that falls, or is it more like biological evolution? Or a computer program that is being executed? Apparently, musical teleology eludes such classifications, which, however, does not invalidate them completely. Works of art have a way of expressing the same relationships as do phenomena in both inanimate and animate worlds, including moving toward a goal/end. The latter aspect is especially relevant for music, the art of change in time. We can, therefore, be justified in the attempt to establish correspondences between music and such taxonomies of teleological or pseudoteleological phenomena, both in the sense of specific compositional procedures and the ways in which we think about

³ He first proposed these terms in an earlier publication, and was critiqued by Ernest Nagel (1977), who offered useful suggestions on the criteria for teleology, albeit never mentioning an artistic creation.

music. To anticipate the ensuing discussions, when Jean Philippe Rameau treats musical events as masses in motion, as colliding bodies; when he talks about tonal attraction, he connects with the Newtonian vision of the universe, which matches the description of telematic processes. Furthermore, organicistic views of music also used to be highly influential; in Schenker's version, motives even have the urge to procreate. We can then update Schenker's views and claim that a composition is genetically programmed to follow a specific course of events. This is clearly a teleonomic view. And once we are in the realm of biology, then evolution cannot be far, and indeed, a composition may follow an *evolutionary* course, it *evolves* toward certain outcomes, regardless of whether or not evolution is considered to be teleological or not.⁴

To conclude this preliminary discussion: we may or may not sort out what is goal-oriented and what is merely end-oriented, but when discussing musical teleology, we must pay attention to both. Furthermore, it may be true that goals pertain to the creator of music. In the music itself, there may not be an actual purpose, but formal relations—purposiveness—is there. That's what we learn from Immanuel Kant.

3. The Newtonian Universe

Having previously mentioned natural philosophy, I could have started with pre-Socratic philosophers as they arguably provided a framework for both scientific and philosophical thought with their interest in the nature of physical reality and the nature of temporal change. I could have started from many other points, but as this paper has no pretensions to exhaustiveness and choices had to be made, my choice of the starting point is the scientific revolution of the 17th century. Indeed, around the year 1600 major scientific and philosophical advances were accomplished—Galileo, Kepler, Francis Bacon—continuing with Descartes, Pascal, and many more, and culminating later in the century with such gigantic figures as Spinoza, Leibniz and Newton.

Newtonian mechanics is deterministic. Everything is explained in terms of forces and masses in motion and everything is determined by initial states and laws of motion. Newtonian Universe is reversible, a body moves from point A to point B, reverse the direction and it will retrace all its previous states; the pendulum swings back and forth; planets revolve around the Sun and there is no privileged point on their trajectories, nor would their motion be different if they revolved in the opposite direction. All states are equivalent: “each of them allows all the others to be calculated, along with the trajectory which connects them, be they in the past or the future” (Prigogine & Stengers 1984: 60–61). A trajectory is not (or not necessarily) a path toward a goal. The circle of fifths is a trajectory, and to jump two centuries ahead, this connects to transformational and neo-Riemannian theories. Maximally smooth cycles are trajectories, and reversible.

The ultimate conditions of Newton's system are absolute time and space. Time for Newton is not much an arrow, it is rather like a container to be filled.⁵

Newton expresses the laws of nature in exact formulas, but he also considered himself a philosopher of nature. His mechanistic, clockwork model of the universe was shared by the major philosophers of his age. Thus, Spinoza's stark determinism expresses similar ideas: Newton's gravity is Spinoza's God, *Deus sive natura*. For Spinoza, there is no free will, only the necessary cause (Spinoza: I, 32⁶), and there is no room even for divine intervention. Both Newton and Spinoza are anti-teleological. Spinoza clearly states this when he says that Nature has no fixed goal and that all final causes are figments of human imagination. If God acts with an end in view, he must necessarily be seeking something that he lacks, which would clearly contradict his perfection (Spinoza: I, appendix).

This has an ambiguous relationship with musical teleology. Generally, science deals with causes and effects. Spinoza himself argues that nothing exists from whose nature an effect does not follow (Spinoza: I, 36). We need to be reminded that the teleological status of causality is dubious, as the Mayr taxonomy suggests. It does have some pre-teleological qualities, though: a teleological equivalent in the inanimate world. If a cause yields an effect, the effect may, at least in principle, be conceived of as the goal. We can presume certain logic in the succession of states: the present state of the system constrains the next state. These point-to-point

⁴ It used to be considered as such, complete with the idea of the Great Chain of Beings and the like. Nowadays, the prevailing view is that adaptedness is “an a posteriori result rather than an a priori goal-seeking” (Mayr 1992: 131). Gary Tomlinson talks about “emergent, bottom-up complexity” (Tomlinson 2015: 16); De Landa (2000) insists on feedback loops and so on.

⁵ “All things are *placed in time* as to order of succession” (emphasis mine). His view of time is, of course, rather more complex. He recognizes the difference between absolute and relative time (the later also called duration), and he recognizes the *order of succession*, which may contain a seed of teleology (Newton 1999: 408–410).

⁶ References to Spinoza's *Ethics* are made by the book number, followed by the number of propositions.

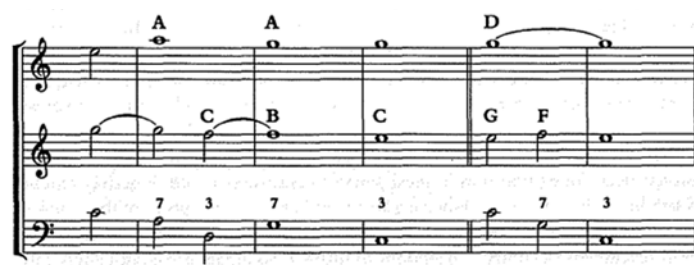
connections may or may not provide sufficient information on the final state, but they in themselves constitute something for which we have already coined the term microteleology.

Another caveat is the problematic status of causality in music. We could hardly say that a dominant chord is the cause of the tonic that follows, that a trio is caused by the preceding minuet and so on. To claim that one musical event causes another is to probably commit the fallacy *post hoc ergo propter hoc*. The reason why I nonetheless toy with the cause-effect pattern is our predilection for inferring causality. We easily read both teleology and causality into everything, artistic works in particular. A nightingale sings at dawn and afterward the sun rises. But we can envision a world in which a nightingale's song *causes* the sun to rise, and in which he sings *in order* for the sun to rise: this is what art is doing all the time.⁷ Since it has been repeatedly argued that music is isomorphous with physical or psychological processes, it is only natural to invest it with both causality and purposiveness.

We need now to return to Spinoza and approach the relevance of his thought for teleology from another angle. It may be somewhat surprising to invoke Spinoza in a discussion on the arts when his meticulously elaborated system leaves little room for such discussion. Yet, it can hardly be conceivable that his profound thoughts could be irrelevant for such a major aspect of human existence. It has been demonstrated (Rice 1996) that his ideas reverberate through aesthetics in important ways. Namely, "the major goal of Spinozistic ethics is the replacement of passive states or affects (wherein one is blindly controlled by the environment) with active affects (wherein one becomes a controlling factor in the environment which is operative upon him or her) ... accomplished through the use of reason, but without abandoning the framework of sensory stimuli which form the core of human experience" (Rice 1996: 482). Referring to "sensory stimuli" is clearly applicable to arts. Moreover, his teaching of affects, drawing on Stoics, may be interpreted as the mastering of tension, that I have already indicated, first as the most fundamental mode of experiencing music, and next, as a kernel of teleology.

If we want to explore in more concrete terms how all this relates to music, a good place to start is Jean Philippe Rameau. As Lawrence Zbikowski puts it, Rameau's conceptual model for musical mechanics maps Newtonian physics onto musical events to explain musical syntax (Zbikowski 2002: 125), even if it considerably trails behind the scientific advancements it draws on.

Nothing moves in the physical Universe without some causation, so must apply to music. Rameau finds such a causative force in dissonance: an agent that propels the motion. Thomas Christensen captures this idea when he says that "In Rameau's mechanistic image, consonance is like equilibrium in mechanics; it constitutes a state of repose and stability. Dissonance is a displacing force, a disruption of this repose. The effect resulting from this so-called collision of sound has much in common with the collision of solids" (Christensen 2004/1993: 107).



Example 1. Rameau, Example II.8 from *Treatise on Harmony*

This is illustrated by Example 1 from Rameau's *Treatise on Harmony*. Here is Rameau's analysis: "dissonance B is at rest when consonance A strikes it. Immediately after the collision, the consonance becomes immobile and obliges the dissonance to pass to C. This is effectively the place to which the consonance itself could have passed but can no longer do so since the dissonance has taken its place. The consonance seems to have given all its motion to the dissonance. Consonance D, however, which seems to be immobile, after having collided with dissonance F obliges it to return to G, from where it started" (Rameau 1971/1722: 234–35).

⁷ Here we may again refer to narrative theory. According to Roland Barthes, "the mainspring of the narrative is precisely the confusion of consecution and consequence, what comes *after* being read in narrative as what is *caused by*" (Barthes 1977: 94).

The dissonance hence seems to be reflected with all its motion, after having struck an immovable consonance. This is actually reminiscent of pre-Newtonian (Cartesian) mechanics in which the causative agent in nature is matter impacting upon matter (Christensen 2004/1993: 103).

The entire Newtonian Universe is held together with gravity. And as Rameau's harmonic theory evolved, he started talking (in his 1737 *Génération harmonique*) less about collisions of entities, and more about non-tonic chords returning to their source, drawn toward the center. What matters now is attraction, gravitational pull, rather than impact, and the tonic as the center that draws everything (Christensen 2004/1993: 189). This facilitates the introduction of functional relationships and inevitably paves the way for longer-ranging processes. Both gravity and tonal attraction are unseen forces capable of operating over long distances. Add to this his other major ideas: falling seventh chords moving towards the tonic, fundamental bass as a directed progression, his recognition of the importance of the *cadence*, and the stage is set for the transition from microteleology to teleology proper.

4. Leibniz, the fugue, and onward to the 18th century

Venturing a tentative generalization of musical teleology in the 17th century, I surmise that the bleakly deterministic and non-teleological thought, as outlined above, was insufficient to sustain an elaborate teleological form such as the fugue. Indeed, in 17th-century music immediate progressions are regulated with considerable precision, events seem to logically proceed one from another, one event leading towards another locally, but the overall form of composition is only weakly teleological.

If we are looking for a truly teleological thinker of that time, it will be Leibniz. The Leibnizian world is composed out of an infinite number of autonomous, self-sustaining elements called monads. Let it be mentioned in passing how admirably his monadology and infinitesimal calculus inform each other. The monadic teleology lies first in the fact that each state of a monad is caused by its preceding state, and more importantly, that a monad strives to actualize its potentials. This is connected with the concept of entelechy, which in the original Aristotelian sense was the realization of the potential, but could also be a realized potential—Leibniz attributes some sort of perfection to it (Favaretti Camposampiero 2018)—as well as the vital force, moving spirit.

Leibniz's God has chosen the best of all possible worlds, and this very fact is teleological. The creation had a goal, and the goal was to create the best of all possible worlds. This lays the foundation for a broad teleology of the arts. The artists must imitate this best possible world; otherwise, they will be correcting God.

As pointed out by a number of scholars, a musical form that would in a way embody Leibniz's philosophy would certainly be the fugue. Fugue is also a form in which teleological potential is already evident. Numerous contemporary authors like Scheibe and Baumgarten, acknowledged the importance of the return to the tonic coinciding with the statement of the subject, which concludes an absolute necessity. Leibniz enters the picture when one views the fugal subject in monadic terms: there is the telos of revealing the innermost essence of the subject, and the best possible realization of the subject (Sheldon 1986: 50–51).

There are many more ways in which we may regard the interplay between philosophy, science and art: the importance of the musical scale for Newton's optics, or the behavior of a ray of light for Leibniz's teleology, and so on. Yet, music is not shaped primarily by scientific modeling, or philosophical systems; it is a most complex *human* activity. Then, we ask with Diderot where do we, organized beings with sensations fit into an inert world subject to dynamics. Science must strive to understand life before it can hope to achieve a coherent vision of nature. This applies to art as well. Then we are bound to take into account the human experience of time. To take into account that the reversible universe is far from our everyday experience: just play a film backward. To take into account that no single idea has been more important than the idea of progress in Western civilization for nearly three thousand years (Prigogine & Stengers 1984: 79). Progress, infinite linear progress, in modern thought replaced Christian salvation, claims Karol Berger (Berger 2007: 162). Ernst Mayr draws attention to "the enthusiasm for progress promoted by the Enlightenment" (Mayr 1992: 117). Becoming increasingly aware of these issues, the 18th century was capable of inaugurating large-scale goal-reaching processes in music, teleology on the global level. This is basically what Berger argues in his *Bach's Cycle, Mozart's Arrow*, within a somewhat different intellectual and spiritual framework. He may have just a little bit downplayed the teleological character of the fugue, but his work is a remarkable accomplishment, too substantial to be discussed now.

5. The Science of Heat

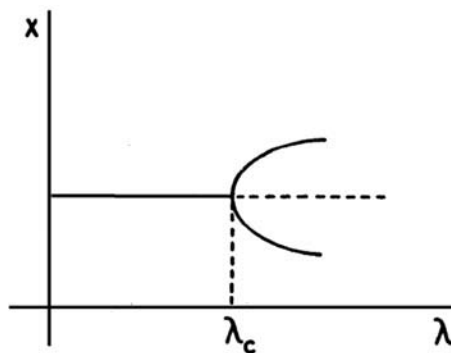
We proceed now to the beginning of the 19th century and the new science of *heat*, thermodynamics. Newtonian gravitation acts upon the inert matter, which submits to it unaffected. *Heat* transforms matter, determines the inner structure, and leads to the modification of intrinsic properties (Prigogine & Stengers 1984: 105). The second law of thermodynamics states that in an isolated system, entropy—the measure of disorder—can only increase. Thus, thermodynamics is an utterly teleological science. The system evolves toward an equilibrium, which is also the most probable state, and this means that all differences are canceled out, the flow of energy ceases, and there is no longer available energy for any work. A comparable example in music could be found in another Penderecki's piece from his “sonoristic” period, *Threnody*. In its quartertone cluster ending, no single voice stands out, no appreciable interaction occurs between the particles. They are evenly distributed, but not because of a set of syntactic rules steering the course of music toward that point. Energy is evenly distributed; the equilibrium is absolute; the music has reached the state of entropy. Such distribution is also the most probable: the *Threnody* cluster is located around the middle register, where the tones are most likely to be. This enables a more general formulation of this law, whereby things evolve from a less to a more probable state. As Thomas Nagel (1986) reminds us, the very fact that of all possible people it is precisely I who was born is extremely improbable. My death is certain. This is a manifestation of the unidirectional arrow of time.

The arrow of time specifies a direction, and in thermodynamics, it also specifies the final state. The cosmological arrow postulates a final state of the universe when it is maximally expanded, but it is not clear whether we have any reliable description of that final state. There is also the psychological arrow, the way in which human beings generally experience time.

While random, chaotic behavior is characteristic of near-equilibrium, Ilya Prigogine brought to light some extraordinary principles governing systems that are far from equilibrium. These systems can be self-organizing. Correlations and coherence will arise spontaneously, as evidenced by many examples of chemical reactions he adduces. Nonequilibrium brings order out of chaos.

The relatively stable states to which such a system tends to evolve are called attractors, and they determine the evolution and guide processes toward definite, yet not always predictable outcomes. To recall the Ligeti example from the beginning of the paper, the interval signals that provide points of stability in *Lux aeterna* fit this description.

Another concept related to the non-linear behavior of these systems is bifurcation (Example 2), “the crossing of nonlinear critical thresholds” (De Landa 2000: 14) when any determinism breaks down and minor fluctuations can produce enormous changes. In *Lux aeterna*, canonic voices pile up and at certain points, the process has a choice: to end on a cluster, or to rarefy the texture and let some clearer sonorities emerge. Vastly different outcomes are equally consistent with the evolution of the system.



Example 2. Bifurcation

To continue with Ligeti. If we compare Ligeti's *Lux* and *Lontano* or *Atmosphères*—their micropolyphonic texture makes them suitable for comparison—we could say that in *Lux*, lower amounts of motion, therefore lower kinetic energy of sound particles, allows for greater *potential* energy owing to the relative positions of these particles, which enables states in which these particles occasionally behave as if imprisoned by their interactions with their neighbors. These states are, of course, boundary-forming interval signals. In *Atmosphères*,

the entire system behaves as if it has nearly reached entropy. *Atmosphères* exists in a kind of thermodynamic equilibrium in which structures are a result of statistical compensation for the activity of microscopic elements. They are inert at the global level (Prigogine & Stengers 1984: 127). The densely packed intertwining lines, no matter how intricately woven, and how hectic their activity, stifle each other, and all this microscopic commotion amounts to an overall sense of stasis.

The image displays two musical scores side-by-side. On the left is 'a) Lux aeterna', which includes vocal parts (Soprano, Alto, Tenor, Bass) and a piano accompaniment. The score features complex, overlapping lines with various musical notations such as 'sempre cresc., sempre pp', 'fz', 'pp', and 'fz'. On the right is 'b) Atmosphères', which is a piano score consisting of numerous staves with dense, intricate musical notation, including many sixteenth and thirty-second notes, creating a highly textured sound.

Example 3. György Ligeti

Edgard Varèse's *Ameriques* furnishes an instructive example of how the world construed by the science of heat is recreated in music. This composition is certainly not teleological in any usual sense. It starts from a state one could conceivably imagine as near equilibrium (Example 4). When the horns explode the flute motives, the violence, the unexpectedness of this destructive event feels like an influx of external force, wrenching the system out of equilibrium, introducing a certain level of entropy, of chaos. There is neither an external formal model that the composition follows, nor a syntax regulating succession of events, nor yet rules of voice-leading. The composition, however, does not fall apart; we do not see a consistent increase of entropy as in classical thermodynamics. The system seems to be self-organizing, as provided by Prigogine's theory. The interactions between constituents are amplified by positive feedback loops creating attractors resulting in new patterns emerging; it is an autocatalytic process. The interactions or collisions of motives or cells seem to generate new motives or motives transmuted to unrecognizability; the products, then, of these interactions further intensify these same interactions to yield more material, whether new or transmuted, which intensifies the process even more, as in an autocatalytic chemical reaction in which the product of the reaction catalyzes and speeds up the process of creating this same product. This is longer-ranging than microteleology, but does not reach goal-directedness on the global level. The process is clearly directed, but it can become unpredictable when a point of bifurcation is reached and then an almost negligible change produces enormous effects. There are two such effects. One is the theme-like entity, the only event in the composition that approaches the idea of the theme. We encounter it first at rehearsal 13 (Colfranc Edition) in a very rudimentary form, and later at 33, where it indeed sounds like a full-fledged theme. The other is the Grandioso coda. It sounds like an appropriate ending, in its synthesizing function, and its character in general, but still, nothing in the preceding music pointed toward it.

a)

b)

1 Animato molto subito (♩=112)

Example 4. Edgar Varèse, *Ameriques*: a) beginning, b) rehearsal 1

6. Quantum mechanics

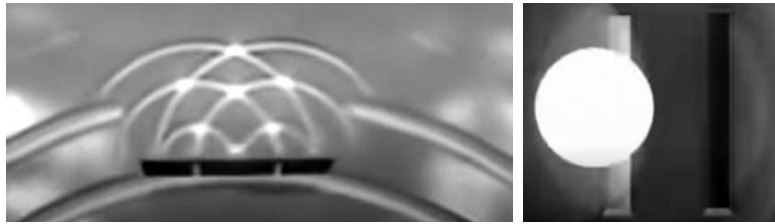
The first three decades of the twentieth century saw the publication of Einstein's theories of relativity and the inauguration of quantum mechanics. Space, time, matter, energy: our view of the most fundamental properties of the Universe underwent a change so radical, possibly comparable only to the seventeenth-century scientific revolution.

But here we enter a truly conflicting world. Einstein stipulates that theory determines what is possible to observe, but his universe is again timeless and deterministic—he read Spinoza, after all. In his relativistic universe, everything is still determined in terms of initial states and the laws of motion. Irreversibility is an illusion. “For us, convinced physicists,” says he, “the distinction between past, present and future is an illusion” (qtd. in Prigogine & Stengers 1984: 294). Quantum physicists, for their part, could plausibly subscribe to that, but their universe is probabilistic. For Einstein, God doesn't play with dice. For the followers of Heisenberg with his uncertainty principle, God not only plays with dice but is also left-handed.

This probabilistic aspect of science is highly relevant in music, and since the probability is future-oriented, musical teleology. I am not referring only aleatorics, or stochastic procedures as found in Xenakis. Even music that is precisely fixed in the score leaves the impression of being probabilistically organized and impossible to predict; even in the strictest pre-composed serialism, no one can really envisage the exact sound of the composition. The Markov chain—a stochastic process involving a sequence of events in which the probability of each event depends only on the previous one—can be used as a model for the description of specific teleological

properties of certain twentieth-century pieces. I do not mean only algorithmic music created according to the Markov chain principles. We sometimes encounter situations where we perceive goals locally: the immediate goals, the teleology of moment-to-moment connections, or microteleology as I have called it. A currently occurring event determines the next one but does not seem to give rise to any longer-ranging processes.

The behavior of elementary particles studied by quantum mechanics can indeed be baffling. Consider Erwin Schrödinger's wave function.



Example 5. “Double slit experiment”: wave vs. particle

Example 5 represents the famous two-slit experiment. It has been performed in a number of variants, but for the sake of this paper, I will describe it rather like a thought experiment (but with the outcomes that have actually been experimentally confirmed). If we have a plate pierced by two parallel slits, and if we fire a solid body through a slit, it could go through either one or the other. If instead of a solid object, we run liquid, a wave, it will pass through both slits, and beyond the barrier, interference of waves will occur. But if you run an elementary particle, an electron, it will nonetheless display interference, as though a wave passed through both slits. A particle behaves like a wave. If originally—in the early 19th century—the experiment was intended to demonstrate the wave behavior of light, in quantum physics it led to the conclusion about the wave-particle duality. In a more general version, multiple states of elementary particles can be superimposed upon one another, as in Schrödinger’s notorious thought experiment in which a cat is both dead and alive. But once we are reconciled with this situation, totally inexplicable in terms of classical physics (to say nothing of our everyday experience), another surprise is awaiting us. If we observe an individual electron, it will always pass through one slit, as any solid object would. So, the very act of observation collapses the wave function.

Leaving aside the mathematics behind this (Schrödinger’s equation), but following its ontological implications, we could say that the experiment captures in a formula a) inextricability of the observer from the observed (which brings us back to the subjective aspect of teleology); b) the limitations of the observer’s capacities; and, crucially for teleology c) the multiplicity of goals (goals in this case meaning the states to which the particle tends). These generalized implications can hold for music as much as they do for science. So, let us look at a concrete piece to instantiate this.

Example 6. Edgard Varèse, *Offrandes*

At the opening of Varèse’s *Offrandes*, the pitch D in the trumpet is the pivotal intonation, and we are likely to expect it to recur and to conceive of it as a goal of musical motion. There is a psychological mechanism involved, and it was described by David Huron (2006)⁸ At the same time, there is aggregate completion

⁸ Based on robust empirical evidence, Huron makes a claim about “statistical learning”: we predict the most frequently occurring past event (138). At the same time, the event we have predicted accurately is a source of pleasure. Consequently, we are highly gratified by those recurring moments that we can accurately predict (164).

(the F in the French horn marking the end of the first sentence-like structure), a well-known post-tonal teleological resource. The musical matter appears both in a more solid state represented by the intonational fulcrum, and a more dynamic, wave-like one: two quantum states superimposed upon one another. Even as they are goal-oriented, they are also reversible.

Composers like Varèse and especially Webern probed deeply the “subatomic” level of musical substance. And when we observe long-distance connections between their musical particles, we are aware that they do not arise through reference to a center of gravity, but rather resemble quantum entanglement—fundamental identity of particles without any contact. This, however, does not indicate any definite direction in which the sonorous objects move, nor what they are expected to attain. Any teleology sought in such music is very feeble.

7. Conclusions

What is perhaps more important than these particular correspondences are the broader underlying principles: the metaprinciples of science, philosophy and arts, the principles that also underlie the principles of composing music. Newton united the micro and macro worlds with his laws of motion. Twentieth-century science divorces micro from the macrocosm. There is relativity for the cosmic, and quantum for the atomic level. Both seem to be right in their respective domains. We still have no Grand Unified Theory or the Theory of Everything. Our world is extremely teleological and irreversible heading toward entropy; it is also inexorably deterministic, and reversible, hence predictable; but again, it is self-organizing and unpredictable. “Each scientific language can express only part of reality”, says Prigogine (Prigogine & Stengers 1984: 224). There is a place both for reversibility and irreversibility, determinism and stochastic processes; a world of trajectories and of processes; a universe “simultaneously organizing and de-organizing itself” (Prigogine & Stengers 1984: xxvii). Our reality is fragmented. And so is music, and in that context, musical teleology. If functional tonality provided secure teleological underpinnings at all levels, music of the last hundred years or so can devise goal-attaining process locally, but the overall form is rarely and weakly teleological. Micro is divorced from macro.

Within all this multiplicity, the only thing for which there is little room is grand teleological schemes. Here is where I give the floor to the French philosopher Gilles Deleuze, who talks, with Félix Guattari, about the atomization of materials and cosmicization of forces (Deleuze & Guattari 1987: 345–46). And when you are opening toward the cosmos, where might your goals be, facing billions of galaxies each with billions of stars? Proceeding in Deleuzo-Guattarian vein (by proxy, since the following quotation comes from the composer Pascal Dusapin), “to compose is to never begin, to recommence, *or to finish*. To compose is to *continue*” (qtd. in Campbell 2013: 51). There is neither *telos* nor *eschatos*, only plateaus; no trajectories and no points to reach, just wandering, nomadic lines that do not issue from, nor lead toward any fixed points of striated space; a rhizome, rather than a tree.

Naturally, we are not obliged to subscribe to such a radical statement. We are perfectly entitled to believe in music as a paramount *human* activity, expressing our strivings, desires and hopes; in Ernst Bloch’s *noch nicht*, not yet: music as a truly utopian art. But there is an ultimate teleology even in Deleuze, too: the creation of the new, the only teleology he recognizes (Deleuze 1993: 151). Not a bad prospect for artists.

One final thought. The extramusical principles that I apparently impose upon music are not mere metaphors, analogies or models to imitate. Relying on the line of thinking running from Duns Scotus, to Spinoza and Leibniz, to Gilles Deleuze, we would rather think in terms of univocity as Scotus and Spinoza do; of the Deleuzian plane of immanence where “Being expresses in a single sense all that differs”. Every monad, musical or otherwise, may be self-contained, autonomous, with its unique zone of clarity, yet—as Deleuze reads it—it is folding, unfolding, refolding its potentials, which is the entire Universe.

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Muzikos teleologija tarp Newtono, Prigogine'o ir Deleuze'o: Spinozos tapsmas muzikaliu

Santrauka

Telos konceptas (gr. *télos* – tikslas, pabaiga) yra giliai įsišaknijęs europietišrame mąstyme ir labai plačiai pritaikomas (etikos, religijos, metafizikos srityse). Teleologiniai klausimai muzikoje, turint omeny jos laikinę ir procesinę prigimtį, yra labai svarbūs. Beveik kiekvienas muzikos aspektas gali turėti savyje užkoduotą teleologinę dimensiją, kaip ir kiekvienas požiūris į muziką. Kaskart patiriant ar mąstant apie muziką kaip procesą, tėkmę, gali kilti klausimų apie to proceso tikslus ir būdus jiems pasiekti. Šie klausimai išsišakoja į begalę kur kas specifiškesnių temų, pvz.: muzikinio proceso tikslų ir teleologijos sąlygų tipologija (Zatkalik 2013); įvairių parametų (harmonijos, kontrapunkto, formos) procesai, padedantys nustatyti ir pasiekti tikslus; muzikos tėkmę link tikslų nulėmiančios jėgos (Larson 2012); lūkesčiai ir jų patenkinimas (Huron 2006), įtampa ir jos sprendimas bei daugelis kitų.

Savo ankstesniuose darbuose aptariau įvykių, atliekančių tikslo funkciją, tipus, įvairių parametų procesus, kreipiančius muziką link šių tikslų, sąlygas, kai muziką galima įvardyti kaip teleologiską. Šiame straipsnyje gilinama ši „techninė“ perspektyva tyrinėjant teleologiją idėjų, per keletą pastarųjų šimtmečių suformavusių europietišką mąstymo būdą, kontekste.

Itin imponuoja santykiai tarp muzikos teleologijos ir būdų, kuriais remdamasis mokslas istoriškai suvokė pasaulį – iš pradžių per gamtos, o vėliau per mokslo filosofiją. Čia nagrinėjama Newtono mechanikos dėsnio įtaka: determinizmas (visos pirminės būsenos ir judėjimo dėsniai yra nustatyti) ir grįžtamumas (gamta turi vienodą polinkį tiek į pradinę, tiek į galutinę būseną), taip pat analogijos iš kvantinės fizikos, kurios vadovaujasi tais pačiais postulatais, bet inkorporuoja tikimybės aspektą. Visa tai yra priešpriešinama klasikinei termodinamikai, kuri yra itin teleologiška (izoliacijoje pusiausvyra nepasizymintys sistemos patiria tam tikrus evoliucinius procesus tam, kad pasiektų tarpusavio pusiausvyrą) ir negrįžtama (entropija gali tik didėti). Ko gero, posttonaliai muzikai aktualiausia yra toli nuo pusiausvyros esančių sistemų, kurios gali pačios save organizuoti, koncepcija (Prigogine & Stengers 1984). Žvelgiant iš šio taško, muzikinis vyksmas panašus į atraktoriaus termodinaminėje sistemoje: santykinai stabilios būsenos, link kurių evoliucionuoja sistemos, apibrėžiančios kismą ir vedančios procesus link konkrečių, bet ne visada tiksliai nuspėjamų rezultatų. Šie principai yra iliustruojami Ligeti, Pendereckio ir Varèse'o kūrinių pavyzdžiais.

Galiausiai, viršmuzikiniai principai, kuriuos autorius įžvelgia muzikoje, nėra vien metaforos, analogijos ar imituojami modeliai. Remdamiesi nuo Jono Dunso Škoto iki Spinozos, Leibnizo ir Deleuze'o besitęsiančia mąstymo linija mes galime mąstyti Škoto ir Spinozos vienareikšmiškumo arba Deleuze'iško imanentiškumo kontekstuose, kur „būtis tuo pačiu būdu išreiškia viską, kas kinta“. Mes galime traktuoti muzikinę kompoziciją kaip Leibnizo monadą: uždara, autonomingą, su savo unikalia aiškumo zona, tačiau, pasak Deleuze'o, atsiskleidžiančią, perverčiančią / naujai atveriančią savo plačius kaip Visata potencialus.

Where Are We Going? Teleological Structures in New Music

Abstract. The beginning of the twentieth century saw some radical changes in compositional thought. The breakdown of tonality in particular had far wider implications than just the emancipation of dissonance and organisation of pitch, extending to formal design and the functionality of material, further challenging pre-existing formal structures. Anton Webern was perhaps the first composer to radically redefine the compositional process in this respect, later influencing the work of Boulez and Stockhausen. How to articulate a formal narrative without functional harmony, however, was one of the central issues, which led to serial organisation. Post-serial thinking further developed a complex network of parametric formal strategies aimed at creating such a dialogue, redefining the function of material and initiating new kinds of formal structures, which similarly require new approaches to listening and perception. How might gesture, density and texture be used to articulate form? How are such structures to be assimilated? How does a composer create a sense of structural narrative? Is this even necessary with new approaches to listening? This paper will examine some of these developments and how they inform my own compositional practice, which involves the complex interaction of parametric layers, with a view to creating a structural hierarchy and meaningful, unfolding dialogue between materials on both the macro and micro levels. My more recent work has further challenged the need for such formal continuity and narrative in an attempt to redefine the structural functionality of material.

Keywords: Boulez, Webern, Redgate, Ferneyhough, teleology, formal narrative, *Etudes Transcendantales*, *Le Marteau sans Maître*, *Drei Kleine Stücke* Op. 11.

My title here refers to the lecture “Where Are We Going? And What Are We Doing?” by John Cage (Cage 1961), which after initially posing the question completely disrupts any sense of narrative by interlocking the text with various other texts inviting an almost Derrida-like reading in a Grammatological sense of intertextuality with various potential meanings. This in itself questions the notion of linear narrative. We are all aware of numerous similar techniques such as Derrida’s own non-book *Glas* (Derrida 1974) written in two columns on each page combining texts and typefaces; Samuel Beckett’s later prose works which “cut and paste” sentences, words and paragraphs contextually redefining their meaning (Beckett 1986), and the poet Jackson MacLow’s systematic chance operations (MacLow 1963). All of which challenge the function of conventional linguistic teleology through narrative and meaning.

In terms of music, the concept of structural narrative has a similar teleological function to that of language guided by functional tonality. However, the beginning of the twentieth century saw some radical changes in compositional thought. The breakdown of tonality, in particular, had far wider implications than just the emancipation of dissonance and organisation of pitch, extending to formal design and the functionality of material, further challenging pre-existing formal structures. If we are to accept that there are “paradigmatic models of particular teleological strategies” in music, which strive towards the final cadence as a “complete fulfillment of a persistently pursued goal, and that sonata form is maybe the pinnacle of such a trend,” how do we create this kind of narrative when such structures no longer exist?¹ What is more, are they even necessary within a different structural framework?

Already in his Second String Quartet Op. 10 (1907/8), Schoenberg was moving into atonal areas, further supported with the addition of a text, which took the work into a new and unexpected harmonic area and formal design. How to articulate a formal narrative without functional harmony was one of the central issues, which led to serial organisation. Post-serial thinking further developed a complex network of parametric formal strategies aimed at creating such a dialogue, redefining the function of material and initiating new kinds of formal structures, which similarly require new approaches to listening and perception. How might gesture, density and texture be used to articulate form, for example? How are such structures to be assimilated? How does a composer create a sense of structural narrative? Is this even necessary with new approaches to listening? At this stage in music history, there are many solutions.

As mentioned earlier, experiments with text in literature initiated new approaches to reading unlocking new levels of meaning. In this paper, I will address some of the solutions to creating alternative formal narratives and structural hierarchies in the absence of functional harmonic teleology. These issues have been of

¹ Quoted from *Principles of Music Composing: Phenomenon of Teleology* conference call for papers, 18–20 November, 2020 Vilnius, Lithuania.

central concern to my work as a composer in terms of unfolding processes, which impact both surface material and larger-scale formal structure.

Of course, an extensive discussion of such developments over the last 100 years or so is beyond the scope of this article. We might consider Stockhausen's *Moment* form, for example, or Elliott Carter's structural polyrhythms; the innovations of Spectral music with slowly transitioning timbral changes of spectra, from harmonic to inharmonic as a new approach to harmony and timbre (a possibility already predicted by Schoenberg as early as 1911) (Schoenberg 1911); Helmut Lachenmann reinvented the functionality of material through the concept of *musique concrète instrumentale*, while Xenakis explored stochastic processes. There are many other such technical developments including minimalism, micro-tonality and electronic music/sonic art, plus the many variations/combinations of the above. Some works seek to frustrate a conventional sense of narrative, such as the use of chance techniques and open forms; and John Zorn's genre-hopping compositions and "card" pieces or Brian Ferneyhough's more recent explorations in discontinuity.

However, for this essay, I intend to focus on the work of three composers Anton Webern, Pierre Boulez and Brian Ferneyhough. They each represent a different period from the 20th century but seem to have a sense of linearity in terms of the development of certain structures, which are closer to my aesthetic as a composer. That's not to say that their music is similar in the functionality of material as such, or the listening process. This further raises interesting questions as to how we listen to music. How many of us are really aware of the structural devices at work, even sometimes in the most conventional music? Is this really part of the listening process?

Anton Webern was one of the first composers to fully absorb the implications of atonality in terms of articulating new formal structures. I would briefly like to examine an early free atonal work, the third of the *Drei Kleine Stücke* for cello and piano, Op. 11, composed in 1914. The work is characteristically only 10 bars long, and just over a minute in duration, which for our purposes makes it useful to analyse.² Example 1 shows the score in its entirety:

Example 1. Webern, *Drei Kleine Stücke* for cello and piano, Op. 11 No. 3

Webern was very much aware that a new approach to pitch was not only a matter of tonal orientation but also impacts material in articulating form. How do we give pitch a new sense of structural function to support a formal narrative without functional harmony? What are the implications for other aspects of the material?

The 10 bars here can be divided into 3 sections of 3, 3 and 4 bars respectively. The first section (bars 1–3) introduces the basic structural elements. In terms of pitch we have the isolated E flat–F flat trill in the cello bar 1, played *sul pont.* This is followed by a linear chromatic fragment (C–B–B flat), also including a harmonic and within a triplet in bar 2. The piano enters with a single chord (C#–D–F), significantly with F as the lowest note in the bass. This is then answered by the piano in the second section, bars 4–6, with transposition and reordering of the cello's three-note fragment (F#–G#–G). In each case, there is an octave displacement of one pitch (the highest in descending order) adding a sense of teleological tension to the line. This piano phrase is connected by an interval of a minor 6th with the last note of the cello (B–F#). The piano segment also has the same, although displaced, rhythmic profile as the cello's phrase in terms of duration in triplets. This leads

² See also Perle 1992 for a discussion of this work.

to the final chord of this section (E–E \flat –G) in bar 6, which is a transposition of the initial piano chord, and also includes the E \flat –F \flat of the cello's first bar. The cello here just has one note, the high F, now the highest note. The opening pitches here have been spread over a wide tessitura with the pitches E \flat , E and F being the only common pitches to both instruments. In bar 1 the E (F flat) was the highest of these pitches and the F the lowest, a relationship, which is now inverted in bar 6. This has the effect of a return to a "tonic" chord after the quasi "modulation" of the central piano segment since this last bar contains both the common pitches and transposition of the chord from the piano in bar 2. Again there is a sense of teleological focus and climax in the gradual expansion of the tessitura, from a semitone trill to the widespread chord in bars 5–6.

The third section, bars 7–10, starts with an isolated piano chord, once again defined by a triplet, the pitches of which are made up of the chromatic fragment in the cello (C–B–B \flat) plus an F \sharp maintaining the minor 6th connecting interval which joins the chromatic segments of the first two linear phrases. The cello then concludes with harmonics, connecting it to bar 2 in terms of articulation, but also using the pitches of the first piano chord (D–C \sharp), now the highest pitches, were previously the lowest in the piano. The one pitch we have not discussed is the A harmonic in the cello, bar 8, which concludes all the 12 pitches of the chromatic scale.³ It should also be noted that the last section from bar 7 omits the pitches common to both instruments (E \flat –E–F) from the first sections. It's clear how Webern was trying to create a narrative, with a comparable structural articulation to functional harmony, albeit with a very different functionality of pitch. The use of register, linear profile and articulation further support a teleological unfolding.

We can already see the latent aspects of serialism here, which was to develop a little later and help solidify such relationships with its highly structured note rows.⁴ Indeed the pitch structures in this little piece for cello and piano already foreshadow the kind of intervallic relationships to be found in Webern's later note rows. This kind of thinking was aimed at finding an inner logic to pitch structures not determined by functional harmony, but to create a hierarchy and sense of formal narrative. I chose not to discuss serialism *per se* as my focus was on more transitional aspects of language and perhaps something closer to Adorno's concept of a *Musique Informelle* in terms of the unfolding of material and articulation of form (Adorno 1963).

Pierre Boulez later refined such serial structures in his work *Le Marteau sans Maître* (1955), with a view to creating harmonic fields derived from a series through the application of his (by now well-known) chord multiplication system (Boulez 1963). Again this created a harmonic narrative defined by the distribution of harmonic "domains" derived from permuted divisions of the series, which were organised according to a structural hierarchy. A closer look at aspects of the structure in the 1st movement of the work *Avant L'Artisanat furieux* reveals its intended formal narrative.⁵ Example 2 shows the basic divisions of the series and derived chords of harmonic Domain I. As we can see the series is divided into segments through the permutation of a matrix (21243).

I	2		4		2	1	3
II		4		2	1	3	2
III	2	1		3	2		4
IV	1		3		4		2
V		3		2		4	2

Example 2. Boulez, *Avant L'Artisanat furieux* division of the series into harmonic domains

³ Webern considered a work to be complete when all 12 notes of the chromatic scale have been used (Webern 1960).

⁴ Compare the series from Alban Berg's Violin Concerto (1935) and The Lyric Suite (1925–6), for example; or Webern's own characteristic rows from the Concerto for 9 instruments (1934) and Variations for Orchestra (1940).

⁵ I am indebted to the work of Lev Kolbyakov here, with his extensive analysis of *Le Marteau sans Maître* in Boulez, *A World of Harmony*.

Example 3 shows the resulting Domains I–V from the remaining permutations of the series, which are then further modified by the chord multiplication system, combining the intervallic structure of each domain: chords I+I, I+II, I+III etc. This yields a rich and complex reservoir of harmonic groups further labelled a b c d e, see Example 4.

Example 3. Boulez, *Avant L'Artisanat furieux*: Domains I–V

Example 4. Boulez, *Avant L'Artisanat furieux*: final harmonic Domains

After this process, each Domain has a similar set of 25 chords. The next step is to decide how these chords could be distributed throughout the work to create a coherent harmonic narrative. The work is divided into nine subsections using Domains I–V, which are symmetrically distributed. Domains I, II and III form the first, middle and final sections, framing two groups of three sections, each of which contains groups IV and V, framing III and II respectively, which reflects a condensed version of the overall form with II and III in reverse order. Example 5 shows an outline of this structure.

Bars	1-10	11-20	21-32	33-41	42-52	53-60	60-68	69-80	81-95
Domains	I	V	III	IV	II	V	II	IV	III
No of groups	15+15	16	14	14+15	15	14	15	15+15	16+14
No per section	30	60		15		59		31	
No of domains	1	3		1		3		1	

Example 5. Boulez, *Avant L'Artisanat furieux*: formal plan of harmonic distribution

Each of these Domains is further defined by a specific approach to the layout of the material and distribution of the groups according to a matrix. We will examine the first two sections. In the first 10 bars, Domain I is divided between two duos, flute/vibraphone and viola/guitar of 15 groups each.⁶ Example 6 shows the route through the matrix for each group, the guitar and viola being a retrograde of the flute and vibraphone (where ea, db, bc, cd, de etc, are results of chord multiplication as shown in example 5). Further, there is a gradual cross-over of the number of groups: 5–4–3–2–1 (flute/vibraphone) and 1–2–3–4–5 (viola/guitar).

Bars 1-10 flute/vibraphone Domain I					Bars 1-10 guitar/viola Domain I				
ea	eb	ec	ed	ee	ea	eb	ec	ed	ee
da	db	dc	dd	de	da	db	dc	dd	de
ba	bb	bc	bd	be	ba	bb	bc	bd	be
ca	cb	cc	cd	ce	ca	cb	cc	cd	ce
da	db	dc	dd	de	da	db	dc	dd	de

Example 6. Matrix distribution of domains between the duos in section I bars 1–10 of *Avant L'Artisanat furieux*

The next section, bars 11–20, has a rather different approach in terms of the route through the matrix, which has significant consequences in terms of the harmonic structure. In this instance the 16 groups from Domain V are shared between all four instruments, see Example 7. It can be seen from the groups | de ce be ee | dd ed | dc cc bc ec | db cb bc eb | ea da | that each has a focus on one harmonic field: in the first group e; the second d; third c; the fourth b and the fifth a. The overall grouping of the domains also has a structure 4 | 2 | 4 | 4 | 2.

This is in contrast to the more mixed configurations of the first section and is also reflected in the overall instrumental texture.

ea	eb	ec	ed	ee
ba	bc	bc	bd	be
ca	cb	cc	cd	ce
da	db	dc	dd	de
ea	eb	ec	ed	ee

Bars 11-20 (16 groups) Domain V

Domain V - bars 11-20 (16 Groups)															
e				d		c				b				a	
de	ce	be	ee	dd	ed	dc	cc	bc	ec	db	cb	bc	eb	ea	da
4				2		4				4				2	

Example 7. Matrix distribution of domains between all the four instruments in section I, bars 11–20 of *Avant L'Artisanat furieux*

This brief discussion of *Avant L'Artisanat furieux* shows not only the overall harmonic narrative but also the approach to defining and distributing material within the larger-scale form. The distribution techniques give the harmonic clarity a further sense of focus and also define the textural aspects.

⁶ This grouping into duos reflects the specific instrumentation of the work, which combines sustaining instruments with percussive/plucked instruments: voice and non-pitched percussion being further extensions of this in subsequent movements.

profile, but is marked *quasi parlando* and *quasi p sempre*. In the fourth and final Recitative (17/8, bar 22) the oboe and soprano drop out completely leaving the cello unaccompanied, which enters with the Recitative material halfway through the previous Commentary, 3 bars early. It's clear to see a gradual unfolding of the gestural elements giving each Recitative a sense of formal function and direction.

Compare examples 9 and 10 as the first two appearances of the Recitative material.

2

Example 9. Ferneyhough, *Etudes Transcendantes*, Recitative I

Example 10. Ferneyhough, *Etudes Transcendantes*, Recitative II

The intervening Commentaries have a similar sense of unfolding with quite different material, through the use of a high register, with the cello now predominantly in the treble clef, emphasising the early entry of the Recitative material in the low register. In contrast to Recitative I, in Commentary I the oboe now has no quartertones, the cello however has quarter-tonal “commentaries” around shared pitches with the oboe. The soprano also has inflectional quartertones and the introduction of *parlando*. In the next Commentary (bar 9) the oboe material is rhythmically filtered to include long notes, rests and grace note groups.

A full outline of this unfolding and the compositional processes behind it are beyond the scope of this article. However, the previous discussion illustrates the structural narrative and dialogue across the contrasting sections (Recitatives/Commentaries), each of which has a sense of teleology and formal function defined by an elaborative unfolding of material and gestural surface.

Roger Redgate +R and String Quartet No. 4

Finally, I would like to explore how such approaches to form and material have informed my work. A feature of the works we have examined here is the notion of process, which might be considered as an alternative to development, as a gradual unfolding of material, requiring a different kind of listening process. Materials are further often defined by the interaction of various parametric layers unfolding independently.

The first work I would like to discuss is +R (1991, rev 1994), for solo clarinet. For reasons of space, I will focus just on the opening section (a quasi exposition), which in any case serves as a model or template for the larger-scale formal structure.⁹ A sense of teleology here is provided by the interlocking of two contrasting

⁹ For a more detailed discussion of this work, see Redgate 2017.

materials articulated by the systematic erosion of one, the rather static A material, and the increasing length and richness of the second B material. Each material further has a specific set of temporal relations in terms of bars, tempi and time signatures, providing a template for the unfolding filtering process of each subsequent bar cycle. Example 11 shows the basic overall plan of the first cycle.

Tempo ♪ = 120							Tempo ♪ = 120
7 16	5 16	3 16	2 16	4 16	6 16	8 16	2 8
Permutation of 1							
Tempo ♪ = 120						Tempo ♪ = 80	
7 16	2 16	5 16	4 16	3 16	6 16	3 8	8
Retrograde of 2							
Tempo ♪ = 120					Tempo ♪ = 60		
6 16	3 16	4 16	5 16	2 16	4 8		
Retrograde of 2							
Tempo ♪ = 120				♪ = Tempo 48			
2 16	5 16	4 16	3 16	5 8			
Middle of 2							
Tempo ♪ = 120			♪ = Tempo 40				
4 16	3 16	2 16	6 8				
Middle of 1							
Tempo ♪ = 120							
2 16	3 16	Next cycle					
R of 5							

Example 11. Redgate, +R for solo clarinet, formal plan for section one

The process here will be clear. There is a gradual reduction of the A material in terms of the number of bars (7, 6, 5, 4, 3, 2) with each appearance, losing the longest bar length each time (8/16, 7/16, 6/16 etc), and ending with the two shortest bars (2/16, 3/16). The B material is always one bar long but increasing in length with each appearance (2/8, 3/8, 4/8, 5/8, 6/8), but with a slower tempo mark each time.¹⁰ The relative rhythmic density of these bars, however, increases. Both materials are defined by very different characteristics: the A material is at a constant tempo/dynamic moving across the whole range of the instrument and is based on a harmonic plan similar to the Boulez chord multiplication system, enabling the chords (harmonic fields) to gradually slide over each other. In contrast, the B material is initially restricted to a limited low register, which increases in range and includes quarter-tones (absent from the A material) and is more linear in construction. The B material also has a richness of playing techniques and gestures (flutter tongue, tremolo, glissandi, scale-like passages, varied dynamic profiles, grace notes). It was a condition from the outset that this material would add a new element in each appearance, texturally and gesturally unfolding. To illustrate this process Example 12 shows the first 20 bars of the score.

¹⁰ The tempi here are related to the relative proportions of the time signatures of the material A.

+R
for solo clarinet

Roger REDGATE
(1990-91)

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Example 12. Redgate, +R, first 20 bars of the score

The intention here was to create an opening section, which sets up the kind of processes used to further articulate the next 7 cycles/sections, at times introducing new materials whilst also transforming others. These kinds of processes give the music a teleological structural narrative, guided by process and transformation, rather than “development” and functional harmony.

A more recent work is my String Quartet No. 4 – *Six Bagatelles* (2015–), which seeks to explore discontinuity. This is a projected six-movement work of which three movements have been completed to date. The work derives its material from the Webern *Bagatelles* for string quartet Op. 9 (1913).¹¹ My starting point was to analyse the Webern pieces in terms of their various parameters and to deconstruct/transform them using my compositional processes. The resulting music bears little similarity to the original Webern. However, my intention here was to explore the potential of continuity through discontinuity. In some respects this aims to frustrate the conventional notion of linear teleology on a local level, projecting this onto a larger scale format across movements, as a kind of filter form, where materials pass from one movement to the next or disappear/re-appear, cross-fertilizing each other. Each movement, therefore, consists of formal fragments (associated with movements from the Webern), dislocated from a sense of linear development, but which unfold across the work structure as a whole.

Example 13 shows the formal grouping across the movements, where the Roman numerals refer to materials defined by the Webern *Bagatelles*. There is a systematic grouping of movements culminating in movement six, which combines all of the previous materials defined by the filter form.

Movements	Materials defined by the Webern <i>Bagatelles</i>					
	I	II	III			
	I		III		V	
		II		IV		VI
		II	III	IV	V	
	I	II	III	IV	V	VI

Example 13. Formal groupings across the movements of String Quartet No. 4

¹¹ It was part of the commission brief from the Kreutzer String Quartet to base the work on existing bagatelles of my choice.

Example 14 shows a more detailed distribution of the material in terms of their interlocking and formal units across the first three movements. Again the Roman numerals here refer to specific materials derived from the Webern. The second row is the associated tempi with each material, also related to the Webern. The third row is the distribution of secondary material, which is the retrograde of the primary material, and the fourth row, permutations of time signatures defined by the interlocked formal blocks of the primary material. It will be clear there is a lot more to be discussed here, which is beyond the scope of this article.¹² However, I have tried to provide an overview of my approach to formal strategies, which are aimed at articulating a sense of teleology on both a local and larger-scale formal level.

I – II – III (27 bars) Structural phrase length 7 – 13 – 7

Material	I	III	II		I	III	II		I		II		III	I			III	II	III								
Tempo	60	76	120		60	76	120		60		120		76	96...60.....44			76	120		76							
Secondary groupings	III			II		III		I			III		II		I			II		III	I		II		III	I	
Time signatures	3	2	5	5	3	3	7	5	5	3	2	2	5	5	3	8	3	3	3	3	2	3	5	3	2	5	2
Bars	8	8	8	16	8	8	32	16	8	8	8	8	16	8	32	8	8	8	8	8	8	16	8	8	8	16	8
Bars	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

I – III – V (32 bars) Structural phrase lengths 1 – 2 – 5 – 8 – 8 – 5 – 2 – 1

III	I	V	III	V	I	V	III	I	V	III	V	III
76	60	40	76	40	60	40	76.....84	60... 96	60... 44	40	84...76	40
III	V	III	V	I	III	V	I	V	III	V	I	III
2	5	5	2	5	2	15	7	3	2	9	13	3
8	16	8	8	16	8	32	16	8	8	32	16	8
1	2	3	4	5	6	7	8	9	10	11	12	13

I uses secondary groupings - III retrograde

II – III – IV – V (33 bars) Structural phrase lengths 5 – 7 – 9 – 7 – 5

V	IV	III	II	V	IV	III	V	II	V	III	IV	II	V
40	60	76	120	40	60	76	40	120	40	76	60	120	40
V	II	IV	III	V	II	V	III	IV	V	II	III	IV	V
4	15	7	13	3	3	13	3	2	5	2	3	11	5
8	32	16	32	8	8	32	8	8	16	8	32	16	8
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Secondary 9-7-7-5-5

Example 14. Detailed distribution of material across movements I–III

Example 15 shows the first page of movement I identifying each material.

In this paper, I have tried to outline alternative approaches to teleological strategies in a formal design, which challenge inherited notions and models defined by functional tonality. The “strive toward the final cadence” as a “persistently pursued goal” is replaced by the gradual unfolding and interaction of processes, which redefine the nature and function of the material in articulating form. Harmonic functions are given a new sense of hierarchy and perspective; materials are imbued with an unfolding gestural surface, texture and linearity, which create a clear sense of teleological focus; and larger-scale forms are further given a greater sense of dynamic interaction and functionality defined by such processes and materials, with a stronger sense of narrative and teleology through time than functional harmony. However, this inevitably requires new expectations and listening processes in the assimilation of the material.

¹² For more detailed discussion see Redgate 2017.

String Quartet No 4

Material I

I

♩=40 accel. ♩=120

Roger REDGATE

Material III - silence

Violin I

Violin II

Viola

Violoncello

Material II

Material III

Material I

Material II

Material III

Example 15. Redgate, String Quartet No. 4, first page with indicated materials

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Kur link mes einame?

Teleologinės struktūros naujojoje muzikoje

Santrauka

XX amžiaus pradžioje kompozicinė mintis išgyveno nemažai radikalių pokyčių. Tonalios sistemos griuvimas sukėlė kur kas rimtesnius padarinius nei vien tik aukščių ir disonansų organizacinė emancipacija. Pokyčiai išplito ir į formodarą bei medžiagos funkcionalumą, taip mesdami dar didesnę iššūkį nusistovėjusioms formos struktūroms. Antonas Webernas veikiausiai buvo pirmasis kompozitorius, suteikęs komponavimo procesui radikaliai naują pavidalą ir šiuo aspektu vėliau padaręs įtaką Pierre'o Boulezo ir Karlheinz'o Stockhauseno darbams.

Kaip artikuliuoti formos naratyvą nesant funkcinės harmonijos? Šis bene esminis klausimas atvedė kompozitorius į serijinę techniką. Postserialistinis mąstymas padėjo dar labiau išplėtoti sudėtingą parametrinę formos strategijų tinklą, kurio tikslas buvo sukurti būtent tokį dialogą, suteikiant naujas reikšmes medžiagos funkciškumui ir taip inicijuojant naujas formos struktūras, kurioms, be kita ko, reikalingi ir nauji klausymo bei suvokimo metodai. Kaip muzikinis gestas, tirštumas ir faktūra gali būti panaudojami formos artikuliacijai? Kaip galima asimiliuoti tokias struktūras? Kaip kompozitorius sukuria struktūrinio naratyvo pojūtį? Ar išvis tai yra būtina, turint omenyje pakitusį muzikos klausymo traktavimą?

Siame straipsnyje nagrinėjama keletas šių naujų plėtojimo alternatyvų apraiškų ir jų įtaka straipsnio autoriaus kūrybai, kuri pasižymi itin sudėtingomis parametrinių sluoksnių interakcijomis, siekiančiomis sukurti struktūrinę hierarchiją ir prasmingą besivystantį dialogą tarp muzikinės medžiagos elementų tiek mikro-, tiek makrostruktūriniuose lygmenyse. Autorius atskleidžia, jog naujausiuose savo kūriniuose atranda prieštaravimų tarp tokio formos kontinualumo ir naratyvo, skirto iš naujo įprasminti medžiagos struktūrinį funkcionalumą.

Musical Form as a Complex of Virtual Problematic Fields and Processes of Actualization: Emergent Teleologies in Beethoven's *Kreutzer* Sonata, Op. 47 (1803)

Abstract. Music being an art of time, reflections on musical form naturally lead composers and theorists to think in teleological terms, where the musical discourse is articulated upon more or less straightforward goal-oriented processes. Yet, teleology is also a concept rooted in philosophy where Finalist and Mechanist views oppose each other. If the former casts *telos* as *raison d'être*, posing a predefined final cause to the state-of-things, the latter rather implies a causal chain the outcome of which is entirely predetermined by natural laws, failing to recognize, in both cases, teleology's inherent creative dynamic. By contrast, in his *Difference and Repetition* (1968), Gilles Deleuze develops a materialist ontology articulated upon the concepts of virtual and actual where the virtual is a problematic field structured by forces and intensities determining the actualization of individuated singularities, in an outright critique of the Platonist model where the Real conforms more or less reliably to pre-existing ideal essences. In this paper, we first reflect upon how this ontology can bring a renewed appreciation of teleology, asking whether virtual and actual can be related in any teleological way, and further, how this relation can shed new light on musical form. Taking ground on the morphogenesis and ontogenesis acting at the level of the individuation process from virtual to actual, Deleuze's concept of *static genesis* will be revisited through the speculative idea of *static teleology*, and musical form will thus be explored as complex of virtual problematic fields. These perspectives on teleology and form will be illustrated by analyses of Beethoven's Sonata for violin and piano, No. 9, Op. 47 (1803), also known as the *Kreutzer* Sonata.

Keywords: musical teleology, linear time, musical form, Beethoven, *Kreutzer* Sonata for violin and piano, No. 9, Op. 47, Gilles Deleuze, *Difference and Repetition*, ontology, virtual, actual, intensive, philosophy of difference.

As temporal art, music is naturally concerned with directionality, setting goals and expectations, resolutions and deferrals, deviating strategies or means of relentlessly heading *towards*, or simply moving *forwards*. Musical teleology embraces such considerations, but teleology as a philosophical concept—between Finalism and Mechanism—not only casts *telos* as a goal but also as *raison d'être*, which may not successfully account for its inherent creative dynamic. In this paper, we first reflect upon how the philosophy of Gilles Deleuze, with its ontology of virtual and actual, can bring a renewed appreciation of teleology, asking whether virtual and actual can be related in any teleological way, and further, how this relation can inform our view on musical form. We first investigate the morphogenetic—or *horizontal*—implications of these ideas in relation to Jonathan Kramer's notion of linear time. Secondly, we study the *static genesis*—occurring *vertically*—between the virtual and the actual through the speculative idea of *static teleology*, and by approaching musical form as a complex of virtual problematic fields. These perspectives on teleology and form will be explored by analyses of Beethoven's Sonata for violin and piano No. 9, Op. 47 (1803), also known as the *Kreutzer* Sonata.¹

Deleuze's virtual, actual and intensive

In his seminal book *Difference and Repetition* (1968), Deleuze develops a materialist ontology articulated upon the concepts of virtual and actual. The virtual, opposed to the relationship between Platonist essence and its copies (casting a transcendent realm of existence), is as real as its actual counterpart but is rather to be seen as *incorporeal* (Deleuze 1993/1969) or transcendental (and thus fully immanent). The virtual is posited as an ideal structure (*structure idéelle*) of differential elements and relationships, a multiplicity of pre-individual singularities constituting, following Simondon (cf. Simondon 1964), a problematic field of individuation fostering the actualization of state-of-things that, as opposed to more or less bad Platonist copies, do not resemble the problems they solve. *Difference* is the fundamental principle upon which this system relies, and it follows that intensity, as difference,² constitutes the connecting element between virtual

¹ Our focus on the classical paradigm may seem at odds with Deleuze's well known interest in contemporary art: from Artaud's poetry to Bacon's painting, concepts such as "body-without-organs" or "preindividual singularities" easily find resonance. Yet, it's also undeniable that ontologically speaking, any state-of-thing has both individual and pre-individual implications. Thus, discussing the virtual and actual in relation to a more conventional form of expression may tentatively demonstrate that there is no such thing as "Deleuzian music" (cf. Gallope's "Is There a Deleuzian Musical Work?", 2008), but rather *Deleuzian ways* of appreciating it.

² "The expression 'difference of intensity' is a tautology. Intensity is the form of difference in so far as this is the reason of the sensible. Every intensity is differential, by itself a difference. ... Disparity—in other words, difference or intensity (difference of intensity)—is the sufficient reason of all phenomena, the condition of that which appears" (Deleuze 1994/1968: 222/287).

and actual.³ Indeed, intensity drives individuation⁴: first as the metaphysical expression of difference in the virtual, where pre-individual singularities result from the reciprocal determination of differential elements in the structure,⁵ and secondly, intensity constitutes the first factor of actualization of the virtual under the form of actual, yet informal, fluxes of matter and energy, such as found in the egg cytoplasm.⁶ Deleuze calls such intensive processes *spatio-temporal dramatizations*: “Ideal intensities of relations are expressed in actual dynamic changes. The ideal intensive field is dramatized in an individuation” (Williams 2003: 205), and cascadingly “stratifies” into the form of a given organism.

Thus, if Deleuze embraces Simondon’s scientific model as applied to biology, it is also in transcendental terms that he maps this individuation process on the virtual and actual.⁷ The virtual is transcendently pre-individual, it (onto)logically precedes the actual, whereas in Simondon, the problematic field of individuation is made of actual intensive relations of “disparation” to be resolved, and as such, *chronologically* precedes the actual individual. In other words, for Deleuze, everything in the world results from Simondonian morphogenetic processes,⁸ but this also serves as an epistemological model⁹ from which the transcendental conditions of real (as opposed to possible) experience can be devised.¹⁰

That the virtual logically precedes the actual is what can be deduced from Deleuze’s ontological chain going from *differen-t-iation* (determination of the virtual) to *differen-c-iation* (individuation of actual things), where the virtual is made of pre-individual singularities (it is *differen-t-iated*), allowing for actual individuals to be *differen-c-iated*, with intensity as virtually *implicated* and actually *explicated*. Paradoxically it is upon effectuation that the actual is virtually counter-effectuated, a wording that rather suggests that the virtual comes second.¹¹ Yet, that the virtual appears as implicated or enveloped within the ontological depth of the actual does not threaten the idea that the implied virtual constitutes the transcendental conditions of the actual, for it is at the same time that effectuation and counter-effectuation occur: virtual and actual are two perspectives on the same *Event*.¹² Finally, it now should be clear that through *differen-t/c-iation*, the actual does not reproduce or represent a predefined entity. Rather it is the product of difference; it solves a problem and is pure and immanent creation.

³ “It is as though everything has two odd, dissymmetrical and dissimilar ‘halves’ ...: an ideal half submerged in the virtual and constituted on the one hand by differential relations and on the other by corresponding singularities; an actual half constituted on the one hand by the qualities actualising those relations and on the other by the parts actualising those singularities. Individuation ensures the embedding of the two dissimilar halves” (Ibid.: 279/358).

⁴ “The essential process of intensive quantities is individuation. Intensity is individuating, and intensive quantities are individuating factors” (Ibid.: 246/317).

⁵ “An Idea ... is neither one nor multiple, but a multiplicity constituted of differential elements, differential relations between those elements, and singularities corresponding to those relations. These three dimensions, elements, relations and singularities, constitute the three aspects of multiple reason: determinability or the principle of quantifiability, reciprocal determination or the principle of qualifiability, and complete determination or the principle of potentiality” (Ibid.: 278/356).

⁶ “How does actualisation occur in things themselves? ... Beneath the actual qualities and extensities, species and parts, there are spatio-temporal dynamisms. These are the actualising, differentiating agencies. ... A whole kinematics of the egg appears, which implies a dynamic. Moreover, this dynamic expresses something ideal. ... Types of egg are therefore distinguished by the orientations, the axes of development, the differential speeds and rhythms which are the primary factors in the actualisation of a structure and create a space and a time peculiar to that which is actualised” (Ibid.: 214/276).

⁷ “However, energy in general or intensive quantity is the *spatium*, the theatre of all metamorphosis or difference in itself which envelops all its degrees in the production of each. In this sense, energy or intensive quantity is a transcendental principle, not a scientific concept” (Deleuze 1994/1968: 240/310, original emphasis). For further discussion on the much-debated status of the Intensive in Deleuze’s ontology, see Bowden and Clisby: “commentators appear to be divided as to whether the Intensive is virtual in nature, actual in nature, or whether it constitutes a third ontological realm” (Bowden and Clisby 2017: 154).

⁸ “Every diversity and every change refer to a difference which is its sufficient reason. Everything which happens and everything which appears is correlated with orders of differences: differences of level, temperature, pressure, tension, potential, *difference of intensity*” (Deleuze 1994/1968: 222/286, original emphasis).

⁹ “The world is an egg. Moreover, the egg, in effect, provides us with a model for the order of reasons: ... differentiation-individuation-dramatisation-differenciation” (Ibid.: 251/323).

¹⁰ Ibid.: 69/95.

¹¹ That the virtual corresponds to the counter-effectuation of the actual is a wording that is to be found more extensively in *Logic of Sense* (Deleuze 1993/1969).

¹² “In this sense, it is correct to represent a double series of events which develop on two planes, echoing without resembling each other: real events on the level of the engendered solutions, and ideal events embedded in the conditions of the problem” (Deleuze 1994/1968: 188/244).

Deleuze, Kramer and emergent teleologies

Musical teleology is often broadly defined as *goal-orientedness*. In Aristotelian thinking, *telos* concerns a thing's final cause, its purpose: the telos of the seed is to grow into a tree. Although this finalist view has always been a matter of debate, namely as opposed to mechanist conceptions where the efficient cause constitutes a sufficient reason in itself, the idea of *aiming towards* permeates most aspects of our life. The question as to what form teleology can take in music, and which of the finalist or mechanist views is more suitable to account for its fundamental logic remains elusive, namely whether expectations can be intrinsically determined by the music itself, or if external factors such as learned experience are necessary to their functioning. For the purpose of our discussion, we assume that music has both the capacity to set up expectations for goals to be reached and to purposefully avoid doing so and that learned experience simply reinforces either feature. Fostering expectations thus places us in a finalist mindset where a predefined goal seems both to pre-exist its realization and to motivate and eventually subsume what leads to it. Alternatively, in a mechanist framework, the music flows forward according to inherent rules without arousing definite expectations.

In Jonathan Kramer's *The Time of Music* (1988), musical time results from various levels of interactions between linearity and nonlinearity. Linearity consists of "the determination of some characteristic(s) of music in accordance with implications that arise from earlier events of the piece. ... Nonlinearity, on the other hand ..., is the "determination of some characteristic(s) of music in accordance with implications that arise from principles or tendencies governing an entire piece or section" (Kramer 1988: 20). Certain compositions emphasize linearity as in tonal music ("the quintessential expression of linearity") (Ibid.: 23), while others have no apparent linear implications, thus highlighting their nonlinear dimension as in music entirely governed by serial thinking, or further in what Kramer terms (after Stockhausen) "moment time". To him, sonata form embodies at its *best-directed linearity*, where the form consists in challenging tonic stability by exploring more or less distant tonal areas, such that listeners feel the necessity of its return, understood and felt like a significant resolution. Moreover, the return to the tonic is most often doubled by a return of the main theme, thus creating the so-called "double-return", which constitutes the main structural goal of the work. All this adequately describes the model to which the Kreutzer Sonata conforms splendidly (Fig. 1).

Slow introduction		1-18	A maj. > min.
Exposition	MT	19-44	A min.
	Transition	45-90	... "V of E"
	ST1	91-143	E maj. > min.
	ST2	144-193	E min. > A min.
Development	Core 1	194-257	F maj. > min.
	Core 2	258-343	D ^b maj. > F min. > (A)
Recapitulation	MT	344-365	A min.
	Transition	366-411	... "V of A"
	ST1	412-464	A maj. > min.
	ST2	465-509	A min.
Coda		510-599	A min.

Figure 1. Beethoven, Kreutzer Sonata: Formal plan

Nondirected linearity also gives a sense of being in motion, as with tonal music, but the idea of a specific goal remains equivocal since a clear sense of expectation is purposely avoided. Kramer: "we do not really know where we are going ... until we get there" (Ibid.: 40). György Ligeti's *Lux Aeterna* (1966) illustrates this very well, for example, when the micro-polyphonic texture, developing as a growing diatonic cluster, reaches a point where only one pitch-class octave remains (Fig. 2). Unlike common tonal practice, nothing helps a listener in anticipating this *goal* in particular, although a sense of orientedness is provided in terms of harmonic direction and density, starting from a single pitch (F), and later settling upon a new pitch center (A) in octave.¹³

¹³ It could be argued that this process (unison-cluster-octave) reproduces the basic *stability-tension-resolution* schema found in tonal music, and that as such, rather enacting directed linearity. Against this view, our claim is that the degree of harmonic-syntactic articulation is a decisive factor in defining a specific goal to be reached. The Ligeti example represents a largely organic fabric that relegates to macroscopic parameters, such as density or register, the function of fostering directionality, in such a way that it is only upon completion of a process that we know that 'this was the goal', whereas in tonal music, we do not feel completion until tonic arrival. In other words, Ligeti's octave is not *necessarily* implied as a goal, whereas the tonic is necessary to tonal completion.



Figure 2. György Ligeti, *Lux Aeterna*: General harmonic outline of bar 1–37
(after Jarvlepp 1981–1982)

Kramer's categories of linear time thus satisfyingly account for our two main teleological types: directed linearity entails finalist implications, and non-directed linearity enacts a mechanist functioning. With the former, every event is understood as oriented toward a goal (*telos*) in the sense of both finality (provided by expectation) and actual destination to be reached, while with the latter, every event is determined by inherent rules, and their succession draws a certain trajectory, but in a continuational rather than dialectical way ("Such music carries us along its continuum") (Kramer 1988: 40). However, in what way can we relate goal and process? What makes a goal resolute in nature? Perceptual factors such as harmonic dissonance and consonance surely participate, but hardly more than as contextual supportive means, and cannot account for the deeper teleological implications in play (e.g. if tonal music associates 'goal' with 'greater consonance', Gérard Grisey's *Partiels* reverses this by proceeding from harmonicity to inharmonicity).

According to Deleuze, the virtual determines times of actualization. The virtual—as the structure of differential elements, relations and singularities—not only determines what the actual *is* in its current state but also the intensive processes that gave rise to it.¹⁴ As an example, a human organ is not the realization of an ideal essence, but the actualization of a system of relations and singularities that progressively determined its growth from the most primary intensive movements of formless matter. This is not to say, for example, that the virtual of an embryo is already foreshadowing that of an adult, which would mean that the virtual exists outside the actual. Rather, each moment of the morphogenetic process is fully actual, implying its corresponding virtual both in constant becoming, and dynamic reciprocal determination; the individuation process follows its course, step by step.¹⁵ It follows then that we can understand the teleology of this system in two ways: first, the morphogenetic process is teleological in a mechanist sense; it goes forward without having a predefined goal. Second, a teleological process as static genesis, or *static teleology*, emerges between the actual state-of-thing and its virtual implications, reversing the sense of implication: not only is the goal implied (as expected), but also all that leads to it that is implied in its intensive depth.¹⁶

In this view, the teleological process is not a fixed path to be followed with a known reachable goal, nor a fully predetermined causal chain. Rather it is a continuously redefined, pure creation, pure becoming, which is akin to our experience of the musical form: at any moment of the unfolding of form, our understanding of processes and their constituents are in constant redefinition. It is only when a cell, motive or theme is segregated from other units in the musical flow that we consider its virtual structure and implied times of actualization to be completed. Even a partial theme or motive can be construed as an actual—however well-formed state-of-thing, with its virtual implications, akin to Deleuze's *larval subject* (e.g. embryo). That a goal is expected from earlier implications in the music does not make it pre-existing (as a Platonist ideal essence waiting to be realized, or as an Aristotelian final cause¹⁷), which can be illustrated by the way composers set

¹⁴ "On the other hand, the dynamisms ... constitute a time of actualisation or differentiation no less than they outline spaces of actualisation. Not only do these spaces begin to incarnate differential relations between elements of the reciprocally and completely determined structure, but the times of differentiation incarnate the time of the structure, the time of progressive determination. ... Finally, beneath species and parts, we find only these times, these rates of growth, these paces of development, these decelerations or accelerations, these durations of gestation" (Deleuze 1994/1968: 217/280).

¹⁵ "It is indeed true that differentiation is progressive and serial [*cascadante*]: the characteristics of the major types appear before those of genus and species in the order of the determination of species; and in the order of organisation, this shoot is the beginning of a paw before it becomes a right or left paw" (Ibid.: 215/277).

¹⁶ "It is sufficient to understand that the genesis takes place ... between the virtual and its actualisation - in other words, it goes from the structure to its incarnation, from the conditions of a problem to the cases of solution, from the differential elements and their ideal connections to actual terms and diverse real relations which constitute at each moment the actuality of time. This is a genesis without dynamism, evolving necessarily in the element of a supra-historicity, a *static genesis*" (Ibid.: 183/238).

¹⁷ It is true that composers have (most often) a precise idea of the destination of the music they are composing, which has been notably demonstrated in the case of Beethoven ("Again, it attests to the remarkable consistency with which Beethoven is concerned with establishing a destination to which his initial ideas will lead," cf. Ahn 1997: 66), and once such an ending has been devised, it may be said to pre-exist what will precedes it, as if the solution pre-existed its "problem". Yet, we can easily imagine

up expectations *in order* to surprise us—thus exploring various potential goals to the same process, just as in the Kreutzer Sonata where unconventional interruptions affect not only the expected musical flow but also our appreciation of musical units in the larger formal context. This happens, for instance, when the main theme presentation leads to a short pause on the relative major (C), breaking the continuity of what should otherwise be understood as a sentence structure (mm. 19–44). The irregular construction of the presentation, itself sentential in design, participates in the equivocation of the fermata on the mediant as ending or not, providing a momentary sense of completion.

Another significant deviation occurs in ST1 (starting m. 91) when what first appears as a varied periodic model (the consequent turns in minor) is retrospectively reinterpreted as a compound sentence of a much wider scope (cf. Schmalfeldt 2011: 100–101). This is done by truncating the consequent continuation and by pausing (fermata, m. 116) on a dominant of III, and then abruptly shifting to a continuation of a very contrasting character (m. 117). The development also presents surprising turns, notably when the expected standing on the dominant in the home key (m. 300), signalling a conventional and imminent “double-return”, is immediately repeated as dominant of D minor (m. 314), leading to a fermata on IV (m. 324), which melodically and harmonically sounds like a false start of the main theme before its actual false recapitulation (m. 326). This adequately prepares for the return of D minor as IV on the MT downbeat in the home key (m. 344). To be sure, such playing with expectations is the bread and butter of most music-making and necessarily implies interplay with stylistic conventions. But what it shows, in turn, is that many solutions exist for the same musical problem, each exploring a different potential of the musical drama that is set up and continuously redefined in a constant *process of becoming*.¹⁸ Cells, motives, themes, sections and the piece as a whole thus appear as various levels of actualization—emergent teleologies, continuously evolving through retrospective reinterpretation, smaller-scale actualizations being seen as local integrations in a larger and global process of actualization, the virtual of which encompasses all the others, thus constituting a genuine multiplicity of multiplicities.¹⁹

Teleology thus defined bridges together Kramer’s directed and non-directed linearity by recognizing their *orientedness* while reinvigorating *goal* with a renewed sense of creativity: the goal is *resolutive*, even when not corresponding to our expectation, it brings a process to a potential close, a potential that goes beyond what will be explored in the work itself, and it is *generative* in the building up of directionality through expectation, which directly affects our experience of actualized goals.²⁰

Further, in addition to teleology as goal-orientedness (finalist) and teleology ‘without a telos’ (mechanist), *static teleology* qualifies the relationship between virtual and actual. As a problematic field, the virtual is implicated in the actual, but it is by *ontogenetic* necessity that the actual is a solution to the virtual. In this (vitalist?)²¹ logic where *telos* = x, teleology turns into a problem-solving process, as opposed to the continuous reification of predefined goals. An emphasis is thus put on the potentialities (as opposed to *possibilities*) of the virtual, the inherent openness of the problem-solving dynamic where the goal is a creative solution to a problematic

that the draft of an ending goes under more or less significant changes upon realization of what leads to it, and so on, along the compositional process, which considerably diminishes the integrity of such “final cause”. However, in the scope of this paper, we limit our discussion on musical form as experienced from the listener’s perspective.

¹⁸ In her *In the Process of Becoming* (2011), Schmalfeldt develops this concept around the idea of retrospective functional interpretation (cf. p. 9).

¹⁹ “In this sense, by virtue of this progressivity, every structure has a purely logical, ideal or dialectical time. However, this virtual time itself determines a time of differentiation, or rather rhythms or different times of actualisation which correspond to the relations and singularities of the structure and, for their part, measure the passage from virtual to actual. In this regard, four terms are synonymous: actualise, differentiate, integrate and solve. ... Each differentiation is a local integration or a local solution which then connects with others in the overall solution or the global integration” (Deleuze 1994/1968: 210/272).

²⁰ See also: “We say that the leading tone “resolves” to tonic. This resolution solves the problem the leading tone (together with the tonic) has created. ... Of course, we can ... anticipate the next move. And to do so is often a habit of engaged listening and playing. But even if the next move is the one we might predict ..., the full, unfathomable potential of the situation necessarily comes into play (even in our decision to predict) in the creation of a new event with all its actual intricacy. Moreover, the always concomitant potential for other progressions necessarily leaves things open (even in our ‘predicting’)” (Hasty 2010: 12).

²¹ As when Deleuze reads Bergson: “The Whole must *create* the divergent lines according to which it is actualized and the dissimilar means it utilizes on each line. There is finality because life does not operate without directions; but there is no ‘goal’, because these directions do no pre-exist ready-made, and are themselves created ‘along with’ the act that runs through them” (Deleuze: 1991/1966: 106/111).

field of forces.²² In such a view, musical form becomes the teleological theater of cascading problem-solving processes doubled by the static teleology of their genetic virtuality.

Musical form as a complex of virtual problematic fields

According to Arnold Whittall, form is the “constructive or organizing element in music”, and it “might be defined simply as what forms have in common” (Whittall 2001: 1) while implying an “infinite flexibility of the relation between ‘form’ as a generic category (such as ternary, canon, sonata) and the musical work as the unique result of the deployment of particular materials and processes.”²³ Further, since early treatises on the musical form were initially oriented toward pedagogical purposes, the quest for common denominators among existing works was all the more natural. Even when a purely musicological paradigm started to develop, Whittall observes, “theorizing became more systematic, and writing about music both critically and historically more formulaic, categorizations of various kinds gained the upper hand, until, as Dahlhaus observed, ‘the theory of form was a description of genres’” (Whittall 2001: 2). Following this tendency well into the 20th century, Dahlhaus’ notion of an ‘ideal type’ illustrates a Platonist paradigm that still tends to make us look at individual works as more or less faithful instances of given abstracted forms.²⁴

Sonata form (as we call it today) had played a prominent role in instrumental music since at least the 1760s, but without having been fully expressed in theoretical writings until the early 1790s, namely in the second and third volumes of Heinrich Christoph Koch’s *Versuch einer Anleitung zur Composition* (1782–1793) (cf. Bonds 1991: 2). According to such 18th-century accounts, the Sonata principle is mostly expressed in harmonic terms, such as in Leonard Ratner’s model (Ratner 1980: 218, cited in Bonds 1991: 31):

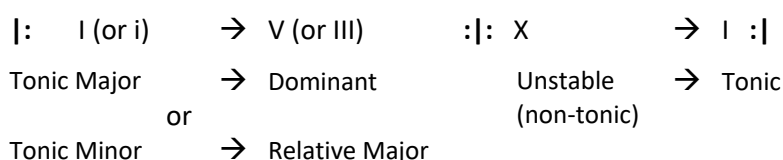


Figure 3. Leonard Ratner’s schema of sonata form

As Bonds confirms, “[w]ithin this construct, the number, character, and placement of thematic ideas can vary widely” (Bonds 1991: 31), whereas later 19th-century accounts of sonata form (Czerny, Marx), rather posit that “the contrast of themes within a movement plays an important structural role” (Ibid.: 33). Fundamental to this model is also the rhetorical substratum according to which a hierarchy is established between main and secondary ideas (derivative and/or contrasting), with appropriate tonal distributions, in such a way that the secondary elements should challenge their main counterpart, thus reinforcing the prevalence and meaning of the latter (Ibid.: 76–80). Beethoven’s Kreutzer Sonata diligently conforms to such criteria of thematic and harmonic relationships, but also through the rigorous motivic *elaboration*²⁵ of the main theme germinal semitone (ic1) from which most of the material seems to be derived. A quick look at the main and subordinate thematic units illustrates this point (cf. Fig. 4).

²² “The virtual possesses the reality of a task to be performed or a problem to be solved: it is the problem which orientates, conditions and engenders solutions, but these do not resemble the conditions of the problem. ... Difference and repetition in the virtual ground the movement of actualisation, of differentiation as creation. They are thereby substituted for the identity and the resemblance of the possible, which inspires only a pseudo-movement, the false movement of realisation understood as abstract limitation” (Deleuze 1994/1968: 212/274).

²³ Ibid. Also, as Mark Evan Bonds reports in his *Wordless Rhetoric*, music theorists in the 18th and 19th centuries addressed this tension between what he terms *inner* and *outer* form, where uniqueness and originality were of the highest value, while conformity to conventional practice facilitated communicability.

²⁴ For instance, when Dahlhaus sees as “problematic” certain elements in the finale of Schubert’s *C-Minor* Piano Sonata design, differing in some respects from Beethoven’s formal procedures, thus showing that “His point of reference is an ‘ideal type’ of sonata form defined in terms of Beethoven” (Gossett 1989: 54, referring to Dahlhaus: 1983/1970).

²⁵ Ibid. ‘Elaboration’ is Koch’s term for what we now call motivic development or derivation (see more on Koch’s theory of composition in Sisman 1982).

a) **Presto** b.i. 1 ic1 b.i. 2 b.i. 3

Vln. *sf* *cresc.* *rallentando* *sf*

Pno. *sf* *cresc.* *rallentando* *sf*

b) 91 ic1 *p dolce* *cresc.*

Vln. *p dolce* *cresc.*

Pno. *p dolce* *cresc.*

103 *p* *p* *cresc.* *p* **Adagio**

Vln. *p* *p* *cresc.* *p* **Adagio**

Pno. *p* *sf* *p* *ic1* *cresc.* *p* **Adagio**

c) 155 *arco* *sf* *sf* *sf* *sf*

Vln. *sf* *sf* *sf* *sf*

Pno. *sf* *sf* *sf* *sf*

161 *ic1* *sf* *ic1* *sf* *ic1*

Vln. *ic1* *sf* *ic1* *sf* *ic1*

Pno. *ic1* *sf* *ic1* *sf* *ic1*

Figure 4. Elaboration from the a) main theme cell a (ic1) in b) ST1 and c) ST2

We can relate the above conception of form to the *three determinations* of the virtual as described by Deleuze in *Difference and Repetition*.²⁶ Here, the virtual structure is constituted of differential elements having the property of *determinability* (unit = ?), of differential relations between these elements that ensure *reciprocal determination* (unit = $x < > \text{unit} = y < > \dots$), and of *complete determination* through pre-individual singularities corresponding to singular points in these relations where a qualitative shift occurs. In the sonata paradigm, such singularities become unit = MT, unit = ST (etc.), with corresponding attributes (tonal, formal, functional, hierarchical...).

²⁶ Cf. note 7 above.

From this quick demonstration, we see that form can be seen as a virtual structure where differential elements, relations and singularities are ready to be explicated into actual musical units. In the Classical style, the sonata form adequately supports (resolves) the functional expression of thematic and tonal hierarchies.²⁷ But one may ask: what about the actual musical content? Why select *this* tempo, *that* character, *these* melodic profiles? In fact, the formal plan constitutes a level of virtuality that is part of a larger problem, a larger Idea²⁸: the *expression* of the work,²⁹ irrigating thematic units, formal design and every aspect of the music. As Deleuze puts it in *The Movement-Image*, “Montage is the determination of the whole ... by means of continuities, cutting and false continuities,” it “is the operation which bears on the movement-images to release the whole from them, [the idea], that is, the image *of* time. It is a necessarily indirect image since it is deduced from movement-images and their relationships.”³⁰

The Idea of the work as a whole represents the larger problematic field of forces that the work actualizes. This is not A. B. Marx’s notion of a fully-fledged musical “Idee” that just needs to be written out, as if existing (Platonist-like) ‘out there’.³¹ The Idea is not a formal plan, a given thematic shape, a harmonic scheme, but all that is expressed by them, it determines the configuration of the actual work.³² Opposed to hermeneutics, the Idea does not possess extramusical *meaning*, in terms of what it can signify beyond itself (e.g. socially, historically), but rather it is a problem that inheres or subsists within every actual aspect of a work, and is constantly shaped and reshaped along with the unfolding of the form while remaining unexhausted by it. When Arnold Schering states that “the first movement of the Kreutzer Sonata describes ... the combat between Tancred and Clorinda from Tasso’s ‘Gerusalemme liberata’,”³³ this amounts to subsuming the actual music under the representation of something else; it tells us little about the inherent forces at play in the music. This is not to say that only one valid answer exists to this question, but rather that we are invited to creatively find ways in which the work can be *problematized*, in order to find not what it represents, but what it actualizes. For instance, in the Kreutzer Sonata, there are many formal irregularities in terms of the thematic structure and consistency of musical flow (as seen above), but also with regards to tonal stability and the formal convention in the context of the classical *accompanied sonata*.³⁴ The beginning of the slow introduction posits these two issues right at its outset: first, the violin appears as soloist, making it at least equal to the piano, and presents a harmonized melody in A major, incidentally casting the main theme opening basic idea (b.i.) in retrograde (Fig. 5).

²⁷ The problem of form can hardly be detached from style and other social, historical, cultural dimensions – all complex virtualities by themselves and all related to each other, but for the purpose of our discussion our narrower focus will suffice.

²⁸ In *Difference and Repetition*, Deleuze uses interchangeably Idea (capital i), virtual structure and ideal structure; this is the sense that Idea is used here.

²⁹ We borrow this phrasing from Deleuze in *Logic of Sense*, where he situates sense as the *expressed* of the linguistic proposition, which is to be distinguished from its signification.

³⁰ Deleuze 1997/1983: 29/46 (original emphasis). The *idea* (without capital i), as used in the original text in French, is to be included with the Idea of *Difference and Repetition*. See also: “The idea is not a given structure, fully articulated, that would act as a development program. Nor is the idea equivalent to a plan for organizing the work, for the author cannot know in advance the steps, the operations he will have to go through to unfold or actualize the idea. And if the author cannot know in advance the elements or the steps to be taken to actualize the idea, it is not for lack of knowledge or know-how; it is the problematic nature of the idea that makes it inaccessible to a priori knowledge. An idea is both indeterminate and determinable, and it is repeatedly that it is determined” (Cardinal 2010: 13, our translation).

³¹ Bent 2005/1994: 216: “The composer’s imagination tracks this aimless stream of sound [that goes on purposelessly in his mind] for something reflective of his inner world of feeling, and upon finding it engages it, so imbuing it with purpose. This engagement of raw material with the composer’s spirit [*Geist*], this fusion of external with internal, yields the ‘Idea’ [*Idee*], which is initially largely subconscious. The process of composition is the ‘liberating’ of this Idea, it is its disclosure to public gaze. Marx’s view clearly comes out of the metaphysical idealism of the Neo-Platonists whereby the artist intuitively a vision of ultimate reality, universal Idea, and imitates this reality in art.”

³² “The Idea of music names a dimension of musical experience that can not be parsed into discrete, identifiable, namable constituents. Idea is pure potential, a multiplicity that is neither one nor many, and a multiplicity ... But to be potential, to have the power to incarnate in the new, Ideas must be differentiated or internally structured.” (Hasty 2010: 10).

³³ Cf. Arnold Schering as cited in a review of his “Beethoven und die Dichtung: mit einer Einleitung zur Geschichte und Ästhetik der Beethovenendutung,” in *Music and Letters*, 1937.

³⁴ To which the Kreutzer Sonata identifies as “*sonata per il Piano-forte ed un Violino obbligato*”.

Figure 5. Kreutzer Sonata, mm. 1–13 of the slow introduction

This melody is immediately repeated in the piano, now in A minor. This leads to a short tonicization of the mediant (C Major, m. 8), and then, and not without suggesting a return to A, the two instruments accelerate their dialogue to finally rejoin on a half-cadence in C, with the MT/b.i. now in the correct order. This segment, along with the MT presentation ending on III (m. 27), shows an inherent major-minor ambivalence that is expressed by the modal instability of the tonic and a deviating tendency towards the relative major. These two features appear also in the subordinate theme group, where, as shown earlier, the consequent of ST1 is set to E minor, as opposed to E major in the antecedent, and in the suspension on dominant of III that precedes the continuation phase thus starting on a tonicization of the relative major (which will realign as A minor and C in the Recapitulation, just as in MT). The subsequent ST2 continuing in E minor, in turn, emphasizes its submediant, C major, thus recasting this chord now as a counterpart in major mode to E minor. In the Development, ST2 undergoes modal instability by being presented occasionally in major (m. 194) or minor (m. 202). It is worth noting that the minor-major opposition within ST1 comes back in A in the Recapitulation (m. 438), thus insisting on the main key modal ambivalence. A final opposition occurs later in the Coda, in the Adagio interpolation at m. 575, where a unit, made of the compression of the MT first and last basic ideas is first set to major chords (VI, ^{II}), melody in the violin, and then to minor chords (iv, i), now in the piano part. At a larger scale, one hears a late response to the opening falling thirds in the violin, in A major, in the piano ascending thirds between mm. 577–581, in minor (cf. fig. 5 and 6).

Figure 6. Kreutzer Sonata, mm. 574–585

Finally, at a larger scale, the second and third movements oppose their respective F and A major to the prevalent A minor of the first.

What forces do these features capture? A possible *interpretation* might suggest the metaphor of “struggling from darkness to light”, or of “heroic idealism drawn by pessimist resistance or threatened by tragic fate”. However, metaphors only tell us what the music *is not*, or it tells what it is *about*, and only postpones the question of the music’s inherent *dramatization*. If the music is to represent an extramusical idea, it first supposes that the idea exists outside of its expression, and second that the music is accessory to its expression. As we have seen earlier, such a Platonist paradigm based upon identity and recognition remains at odds with the virtual. Thus, we should rather ask how can music embody heroism, how can it *be* heroic? What forces does it capture, by its own means making it a genuine exploration of the problem of heroism?³⁵ Even though this seems better, we still need to problematize the notion of heroism in order to find its inherent intensities: how can music embody forces such as “opposition”, “resistance”, “struggling”, and “impulsivity”?³⁶ To *struggle* as virtuality constitutes a problematic field not primarily associated with any form or medium of expression, yet it can only exist as implicated in state-of-things, in such a way that it is inseparable from its actualizations, and is fully determined by them. In the Kreutzer, we have already exhibited the tonal and formal *oppositions*, and we could add a force of *impulsivity* in the way the music is interrupted apparently *at will* before resuming in a totally different character (e.g. ST1). *Struggling* may be felt in the way major and minor modes compete with each other, but also in the melodico-rhythmic shape of MT where after an initial falling gesture, a second b.i. finds its way with apparent difficulty, in an ascent back to its starting point (fermata on E above III), and then pushing it further to the tonic, chromatically, one step at a time in whole notes (m. 42). Incidentally, this logic finds its fullest achievement in the Coda when MT returns (m. 533) and expands its ascending phase, turning chromatic departing from C, up to E an octave above the first, thus marking the dramatic climax of the movement as a whole (Fig. 7).



Figure 7. Kreutzer Sonata, mm. 532–547

As such, this climactic point produces a much more powerful effect than that of the conventional “double-return” of the Recapitulation, not only as a goal but also as an expression of the intrinsic forces at play, of the larger Idea. Receding activity follows this expressive summit leading to a complete liquidation of thematic material, ending in a simple A minor arpeggiation (m. 559). Stopping here could have been an option, but Beethoven makes the Idea more complex: first with the Adagio interpolation where the two ends of the main theme are now united without the *struggling* b.i., and second by a conclusive cadential unit that reasserts the Presto character, sustaining the dialogic *opposition* between the instruments until a final unification on tonic harmony. At another level, *opposition* is also to be found in the way the piece *struggles* with the Classical style conventions of sonata form and the *accompanied sonata* model. Indeed, a dialogue appears here in ways more typically found in the Concerto, as opposed to when accompanying instruments are limited to a clearly secondary role (which “obligato” usually implies).³⁷ Likewise, a dedication written on an autograph calls

³⁵ Just as in *The Time-Image*, when Deleuze critiques the metaphor according to which school is a prison: “... school is a prison, literally, not metaphorically. You do not have the image of a prison following one of a school: that would simply be pointing out a resemblance, a confused relation between two clear images. On the contrary, it is necessary to discover the separate elements and relations that elude us at the heart of an unclear image: to show how and in what sense school is a prison, ... – literally, without metaphor” (Deleuze 1997/1985: 20/32). See also: “But if the school is literally a prison, it is because they are both subject to the same relation of forces [*rapport de forces*]. ... In what way, according to what forces, is the school a prison?” (Cardinal 2010: 92, our translation).

³⁶ “Music attempts to render sonorous forces that are not themselves sonorous” (Deleuze 2003/1981: 48).

³⁷ As reported in Ahn 1997, Chapter 6: in Koch’s writings, the Concerto is a designated vehicle for virtuosity, but is also seen as having a stronger expressive potential than the Sonata. Koch further distinguishes between the “concertante” style that implies a tangible sense of dialogue, even competition, as opposed to “obligato”, where the instruments play a more subordinate role.

for attention: a fragment translates into *Mulatto Sonata composed for the mulatto* [violinist, George] *Bridgetower, great madman mulatto composer*.³⁸ The insistence on the word *mulatto* and its derivatives indicates that Beethoven was aware of the hybrid nature of his work merging aspects of Sonata and Concerto, which is further confirmed by the work's subtitle "*scritta in uno stile molto concertante, quasi come d'un concerto*."

The forces at play in the Idea have thus found their way at multiple levels in the piece, from harmonic behaviours and relationships to thematic materials, and formal and genre conventions. Far from being closed, such a multiplicity is open-ended and each new actualization is a further exploration of its potential, and participates in its ever-growing complexity, while at the same time being inseparable from the musical processes it has engaged within each of its singular actualizations.³⁹

In conclusion, Deleuze's ontology of the virtual invites us to restore the profoundly creative impetus of musical teleology, notably through a more vitalist⁴⁰ appreciation of the relationship between *goal* and *orientedness*, within a more open-ended vision of musical form as a complex of virtual multiplicities that emphasize, at small and larger scales, constant becoming. Form as a problematic field can be explored by problematizing the work under scrutiny, but it should be clear that problematization neither excludes nor denigrates interpretation. A Deleuzian ontology is rather motivated by finding where life lies in its most liberated expression, which happens to be at the level of the pre-individual, where intensive processes are not yet slowed down—if not petrified—into stratified forms. The virtual and later the "body-without-organs", by their differential and intensive nature, are all about informal forces and potentials not yet captured into actualization. It is true that some music overtly embodies this formless imagery, which surely and efficiently fosters a listening experience of the *impersonal* and *pre-individual*, but even a Classical sonata, while very *stratified* as a genre, can be approached from this perspective, and reveal its enveloped intensities, thus recovering an irrepressible and everlasting vibration.

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³⁸ The evident humoristic and friendly tone of this dedication refers to a violinist called George Bridgetower, of Polish and (presumably) Indian origin and with who Beethoven actually premiered the piece. Originally in Italian: *Sonata mulattica composta per il Mulatto Brischdauer* [sic] *gran pazzo e compositore mulattico* (cf. Ahn 1997: 201–203).

³⁹ "An idea is therefore the condition at which beings and things gain a problematic nature. But no problematization exhausts the idea ...: each problematization only reveals a new aspect of the idea more clearly ...; each new concrete problem is a new determination of the idea." (Cardinal 2010: 107, our translation).

⁴⁰ "All I have written was vitalist, at least I hope so" (Deleuze 1990: 196, our translation).

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Muzikos forma kaip virtualių probleminių laukų ir procesų aktualizacijos kompleksas: teleologiniai procesai, atsiskleidžiantys Beethoveno „Kreutzerio“ sonatoje op. 47 (1803)

Santrauka

Muzika, kaip laike išsiskleidžiantis menas, yra neatsiejama nuo kryptingumo, čia formuojami tikslai ir lūkesčiai nuolat judėti *link kažko* ar tiesiog *pirmyn*. Muzikos teleologijos sąvoka aprėpia tokias aplinkybes, tačiau teleologija, kaip filosofinis konceptas – tarp finalizmo ir mechanizmo, apibūdina *telos* ne tik kaip tikslą, bet ir kaip *raison d'être*, o tai anaipol nelemia imanentinio dinamiškumo.

Vienoje iš savo knygų „Skirtumas ir pakartojimas“ (1968) Deleuze'as kalba apie materialistinę ontologiją, paremtą virtualumo ir aktualumo konceptais. Virtualumas, priešingai nei diktuoja platoniška santykio tarp idėjos ir kopijos samprata, yra toks pat tikras kaip ir jo aktualus atitikmuo, tik suvokiamas kaip transcendentinis (bet visiškai imanentinis). Jis pozicionuojamas kaip ideali diferencialinių elementų ir santykių struktūra, kaip daugialypumas iki individualaus singuliarumo, sudarančio probleminių individuacijos, apimančios dalykų būsenos aktualizaciją, nepanašią į jų sprendžiamas problemas, lauką. *Skirtumas* – tai pagrindinis principas, nuo kurio priklauso visa ši sistema. Tai reiškia, jog intensyvumas, kaip skirtumas, yra perėjimo iš virtualumo į aktualumą veiksnys: visų pirma kaip metafizinė skirtumo virtualume išraiška, o antra, intensyvumas yra pirmas virtualumo aktualizacijos elementas, įgyjantis aktualią materijos ir energijos srautų pavidalą.

Straipsnyje nagrinėjama, kaip ši ontologija gali padėti iš naujo pažvelgti į teleologiją, keliamas klausimas, ar virtualumas ir aktualumas gali būti tarpusavy susiję teleologiniu aspektu ir ar šis santykis gali turėti įtakos mūsų nuostatai dėl muzikos formos. Remdamiesi Deleuze'o požiūriu į Gilbert'o Simondono veikalus, mes pirmą kartą susiduriame su šių idėjų morfogenetinėmis implikacijomis Johnathano Kramerio linearaus laiko sąvokos kontekste. Pasak jo, muzikinį laiką sudaro įvairūs interakcijų tarp linearumo ir nelinearumo lygmenys, o tonali muzika yra „[kryptingo] linearumo išraiškos kvintesencija“. Nekryptingas linearumas taip pat suteikia vyksmo pojūtį, bet konkretaus tikslo idėja lieka dviprasė. Kramerio „kryptingas linearumas“ implikuoja baigtinumą, o „nekryptingas linearumas“ nulemia mechaninį funkcionavimą. Kita vertus, kai problemos sprendinys nėra nei išankstinis, nei panašus į pačią problemą, virtualumo ir aktualumo logika požiūrį į teleologiją daro gyvybingesnį, kūrybiškesnį, ir jis yra artimas mūsų muzikos formos patyrimui.

Toliau straipsnyje koncentruojantis į muzikos formą kaip virtualių probleminių laukų kompleksą, gilinamasi į *statinę* genezę tarp virtualumo ir aktualumo. „Idealus“ sonatos formos modelis gali būti suvoktas kaip virtuali struktūra, kurioje diferencialiniai elementai ir jų santykiai yra paruošti eksplikacijai į aktualius muzikinius elementus. Tik ar tai prisideda prie muzikos kūrinio turinio aktualios *išraiškos*? Tiesą sakant, kūrinio formos planas išreiškia virtualumo lygį, kuris yra didesnės problemos dalis, *išreikšta idėja*, „maitinančia“ teminius elementus, formos struktūrą ir visus kitus muzikos aspektus. Šios teleologijos perspektyvos iliustruojamos Beethoveno Sonatos smuikui ir fortepijonui Nr. 9, op. 47 (1803), dar žinomos kaip „Kreutzerio“ sonata, analize.

A Semiotic Approach to Explain Musical Teleology by Means of Musical Intelligibility

Abstract. The main idea that guides this paper is that musical teleology is not in a musical work but in listeners' minds when they transform what they listen to into something intelligible. In brief, when we listen to a musical work, we connect what we hear to transform it into something intelligible by introducing ideas not contained in musical events. As a result, the essential point is to identify which these ideas are. Peirce's semiotics is the conceptual background for this paper, and according to it, these ideas are of three general kinds only. The author names them *similarity*, *directionality*, and *simplification*. To check if these three ideas can explain more complex musical works inside tonal music, this paper analyses the first themes from the first movements of all Beethoven's 32 piano sonatas. Afterward, two contemporary musical pieces are analyzed to check if these three ideas work in a non-tonal repertoire. These works are String Quartet No. 3 by Alfred Schnittke (the first ten measures only) and *Brin* by Luciano Berio. The results show that similarity, directionality, and simplification ideas can explain musical intelligibility and teleology in traditional and contemporary music. Besides, they show that intelligibility does not depend on motives and on one single musical system to create unity and coherence. Instead, they express similarity, directionality, and simplification at the surface level, making teleology more evident.

Keywords: Music, Intelligibility, Semiotics, Teleology.

1. Introduction

The main idea that guides this paper is that musical teleology is not in a musical work but in listeners' minds when they transform what they listen to into something intelligible. As a result, we need to understand musical intelligibility to understand teleology in music.

There is a diversity of points of view about what intelligibility and other closely related terms are. Eero Tarasti (2002: 19–25), for instance, presents fourteen different explanations from different authors for the word *understanding* in music, and many of them are strikingly different. *Meaning* is a term used by both classic authors (Meyer 1956) and many recent authors (Tagg 2013, Widdess 2012, and Woods 2010). Some authors use the word *sense* (Monelle 2000), others prefer the word *expression* (Stratilková 2016).

In this paper, I use the word *intelligibility* used by Charles Sanders Peirce in his semiotics, which is the conceptual background for this paper (Peirce 1931–35, Peirce 1992–98, Atkin 2016, Bergman & Queiroz 2014, Merrell 1998 and Santaella 2005). Besides, with a few adaptations, it is possible to transfer Peirce's explanation of intelligibility to musical context.

According to Peirce (1931–35: §1.383):

the highest kind of synthesis is what the mind is compelled to make ... in the interest of intelligibility ..., and this it does by introducing an idea not contained in the data, which gives connections which they would not otherwise have had.

Adapting it to music and transforming it a little (Zampronha 2004): when we listen to a musical work, we connect what we hear to transform it into something intelligible by introducing ideas not contained in the musical events. As a result, the essential point is to identify which these ideas are. Based on Peirce's semiotics, these ideas are of three general kinds only. In musical terms, I named them *similarity*, *directionality*, and *simplification*.

1.1. Understanding *similarity*, *directionality* and *simplification*

Let us take the paradigmatic first theme of the first movement of Beethoven's piano sonata Op. 2 No. 1 in F Minor to illustrate these three main ideas. Closely following Arnold Schoenberg's analysis of this theme in his *Fundamentals of Musical Composition* (1967), we see this theme is a musical sentence.

Figure 1, letter B shows the first theme of this Sonata (the melody only). Figure 1, letter A, analyzes it as a musical sentence. It includes an opening, a climactic ascension, and a liquidation (resolution). The climactic ascension usually moves to a climax. In this case, the climax is both the final point of the climactic ascension and the beginning of the liquidation, which is why it is a connector.

Figure 1, letter C shows the three general ideas that may connect this theme. They are:

A) *Similarity*. By saying that two or more musical events are similar, we create a connection that synthesizes them and makes them intelligible. In Beethoven's theme, the motives in the opening segment are similar

because they share a melodic shape, a rhythm pattern, and a tonal reference, for instance. The general design connecting both motives is like a *type*, and its different actualizations are like *tokens*. In a few musical works, the general design is so abstract that no actualization perfectly matches it (like the concept of a subtheme in Dahlhaus 1993), confirming that it is an idea we introduce to connect the motives. Contemporary works enlarge the construction of similarity so much that new musical aspects substantiate it (like timber, morphology, and texture, for instance). The word motive may not fit well in contemporary music, and for this reason, terms like “figure” (Ferneyhough 1995) or “gesture” (Zampronia 2005) replace it. In a few cases, similarity can even be a constant state of no change, a sameness which could be intelligible as something similar to itself in time, like something that does not change when compared with itself.

B) *Directionality*. By saying that musical events have a direction or that they point to or indicate something, we connect them in an intelligible way. In Beethoven’s Sonata (see Figure 1, letter B), the segments included in the opening and the climactic ascension are similar but in a compressed way. The first part of the motive, the ascending arpeggio, is simplified into an appoggiatura, and it is still more condensed in the climax. Besides, the climax is the third step in the ascending melodic design, and you connect this ascending sequence by its structural pitches (A₁–B₁–C). In this way, the compression and the ascending movement work together to stress the idea of directionality. However, other resources can create directionality, like gradual changes in pitch density, amplification/reduction of melodic jumps, timbre changes, including many contemporary resources available nowadays. Besides, it is also possible to use “markers” to create directions. Markers are musical events used to indicate the introduction of another one, for instance. It can be a singular sound, a sudden change (a textural one, for example), a silence, or an anacrusis that announces the start of a new segment. Moreover, similarity can be used in conjunction with directionality to make directionality even more intelligible.

C) *Simplification*. By reducing musical events to a musical habit, or a convention, we make musical events intelligible. The melodic design approaches a scalar form in the two last measures of Beethoven’s theme because a scale is a highly conventional pitch ordering. However, the convention could also be a chord or include a rhythmic reduction to the beat, and the like. Simplification is not a scale or a chord as such but a *reduction* to these or other conventions. In contemporary music, the use of a fade-out to conclude a piece of music is a known cliché because it eliminates any sound features in favor of silence. In this case, simplification is the reduction to silence. When a simplification reduces to a non-conventional musical entity, the non-conventional musical entity is a perceived regularity in a musical work. However, as an alternative, borrowing can be used. Borrowing is a simplification procedure usually (but not always) taken from musical tradition and used in non-traditional musical works, as I will exemplify later. Finally, directionality and similarity may work together in favor of simplification. Directionality may stress the reduction to a convention, and similarity may highlight different phases in this reduction, for instance. However, they may be present but latent, as there is no reduction of this kind without any directionality or similarity.

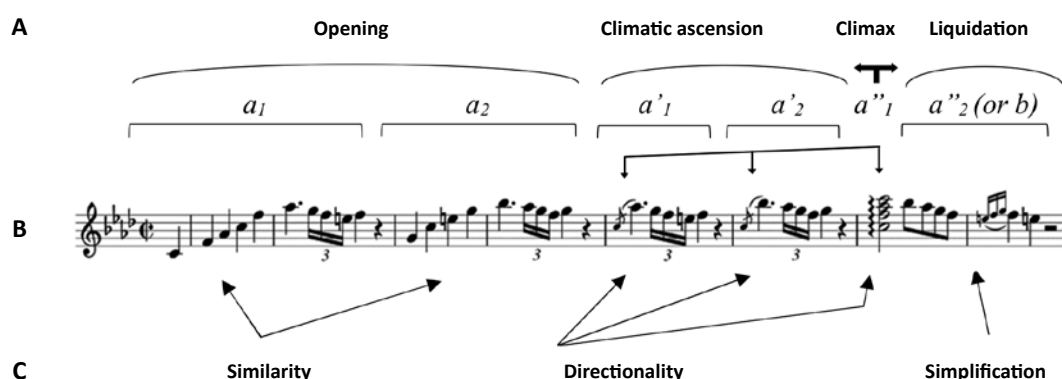


Figure 1. The first theme from the first movement of Beethoven’s piano sonata No. 1.

Letter A: Analysis based on Schoenberg (1967). This analysis is not a reproduction of Schoenberg’s one.

Letter B: Beethoven’s theme without articulations, dynamics, and accompaniment.

Letter C: the ideas of similarity, directionality, and simplification.

1.2. Explaining *teleology*

In this context, teleology is a kind of simplification, not directionality only. Teleology requires directionality, but it goes beyond that. Teleology is like a final goal that attracts the previous musical events, regardless of whether this final goal appears in the musical work. That explains why we understand that a musical excerpt “is almost achieving” a goal (it is not only “going somewhere” as it happens in directionality). It is almost achieving a goal because we *foresee* where it is going, and this projection toward the future is used to explain past events. If directionality is like an arrow pointing forward, teleology is like an arrow pointing backward. A simple modulation in tonal music is an example of it. Considering the key of C major, a correct introduction of a D Major chord can be listened to as directionality, giving us the sensation of “going somewhere” (it is a possible modulation). However, it is possible to listen to the D Major chord as the V of the G Major key, and we can do this because we take the G Major key as the final goal. However, only our musical habits allow us to foresee the G Major key as the final goal. If we listen to an E Major chord after the D Major one, our final goal is likely to change from the G Major key to the A Minor key. By doing this, we reinterpret the D major chord. Now we understand it as the IV of A Minor (subdominant) instead of the V of the G Major (a dominant), changing the musical function we had previously attributed to it. So, when we change the final goal, we reinterpret previous musical events to make them intelligible in the context of the new final goal, showing that a future goal creates an arrow that conditions the way we interpret past musical events to make sense of them. Obviously, not only does it happen in tonal music but also in other repertoires including contemporary music.

Most of the time similarity, directionality, and simplification work together, both in sequence and hierarchically. However, similarity does not depend on the other ideas to exist, and it can happen alone. To some extent, directionality requires similarity, and many times they work together. However, simplification requires the other two, which explains the high level of abstraction needed for teleological listening. As a result, similarity, directionality, and simplification can explain the phenomenon of teleology in music. Moreover, this approach to musical teleology can also guide the creation of new non-teleological and teleological musical works, particularly in recent contemporary music, showing that they can be a creative tool as much as an analytical one.

2. Testing the semiotic approach

I analyzed the first themes from the first movements of all Beethoven's 32 piano sonatas to check if similarity, directionality, and simplification ideas can explain more complex sentence structures. Afterward, I analyzed two contemporary pieces of music to verify their efficacy in a non-tonal repertoire. They are:

- Alfred Schnittke: String Quartet No. 3 (1983), the first ten measures from the first movement.
Link: <https://youtu.be/aFuOn47MORQ>
- Luciano Berio: *Brin* for piano (1990), included in his Six encores for piano.
Link: <https://youtu.be/oIBfzKahNzI>

The links above include the recording and the music score of these works.

Different authors have studied postmodernism in music, including historical and aesthetical considerations (Berio 2007, Gloag 2012, Ramaut-Chevassus 1998). Schnittke's work is a polystylistic postmodern work composed in 1983, using both traditional and contemporary techniques. Berio's work is not a typical postmodern work from 1990. However, it shows influences from postmodern music from the 1980s. The use of borrowing is one of them, and I will comment on it later. However, Berio keeps many technical resources from his previous works, which produce a rich blend of musical techniques.

2.1. The first themes from the first movements of all Beethoven's Piano Sonatas

I analyzed the first themes from the first movements of all Beethoven's 32 piano sonatas to test similarity, directionality, and simplification ideas in a traditional but relevant repertoire. The results show that, with just a few exceptions, all themes are sentences. The exceptions are:

- The first theme of Sonatas 12, 13, and 22 are not sentences. They are periods, another traditional form that can be analyzed using similarity, directionality, and simplification ideas. Sonatas 14 to 27 include a few ambiguities that make the analysis a little more complex but feasible. For instance, the first 16 measures of sonata No. 27 form a sentence, but its understanding may change depending on how we understand the next eight measures.

- Rigorously, the first theme of Sonatas 28 and 30 are not sentences, and the traditional analysis explains them awkwardly or does not explain them at all. However, using the ideas of similarity, directionality, and simplification, we observe that the whole exposition is a musical sentence in these works, i.e., there is the transference of the sentence structure from the themes to a higher structural level. This transference conditions the design of their first themes, transforming them into openings. That explains the form they have. As a result, similarity, directionality, and simplification offer answers that go beyond the traditional analysis.

Beethoven Piano Sonatas	1 st movement, 1 st theme
N. 1 to 11	✓ Sentences
N. 12 and 13	× Not sentences
N. 14 to 21	✓ Sentences
N. 22	× Not a sentence
N. 23 to 27	✓ Sentences
N. 28	???
N. 29	✓ Sentence
N. 30	???
N. 31 and 32	✓ Sentence

Table 1. The first themes from the first movement of all Beethoven's 32 Piano Sonatas are analyzed to identify whether they are sentences. The sonatas are grouped according to Beethoven's three compositional periods

2.2. The first ten measures of Schnittke's String Quartet No. 3 (1983)

The first ten measures of Schnittke's work start with an excerpt from Orlando di Lasso's Stabat Mater. Then, we listen to an excerpt from Beethoven's 16th String Quartet, and then the DSCH signature honoring Dmitri Shostakovich (pitches D, Eb, C, and B). It concludes with a variation from the first excerpt by Orlando di Lasso.

Orlando di Lasso

Similarity - - - - -

Ludwig van Beethoven **DSCH** **Lasso (a variation)**

Directionality - - - - - Simplification

Figure 2. Alfred Schnittke's String Quartet No. 3. Schematic reduction of the ten first measures

Each excerpt fulfills a specific formal role, reinforcing the ideas of similarity, directionality, and simplification. Tension increases toward the climax, and it becomes calm again in the liquidation (the modal system returns). The excerpt by Lasso includes two segments connected by similarity, working as an opening. The excerpt by Beethoven has two similar segments, being the second one a semitone higher. In this context, it

stresses directionality. Besides, it sounds like compression because its motives are twice as fast as Lasso's ones. Also, the DSCH signature is a variation of Beethoven's excerpt, and it is the third step in the directionality. The DSCH signature is the climax, and its tension results from its atonal design and expressive melodic shape, which stress the directionality even more. The last excerpt, by Lasso, is a simplification because it resolves the musical tension. At the same time, it diminishes the harmonic complexity, and it returns to the beginning (the initial reference) with a non-conclusive cadence. As a result, similarity, directionality, and simplification ideas connect with Lasso, Beethoven, DSCH, and Lasso's last segment, stressing musical intelligibility and teleology.

Besides, the excerpt by Lasso uses a musical figure that is different from both Beethoven's one and the DSCH signature. It confirms that the use of motives or figures is not a requirement to explain intelligibility (see also Street 1998). Besides, the excerpt by Lasso is modal (despite its strong traces of tonality), the one by Beethoven is tonal, and the DSCH signature is atonal, showing that musical intelligibility does not depend on the presence of one single musical system to organize a piece of music. Intelligibility results from the ideas of similarity, directionality, and simplification.

2.3. *Brin* by Luciano Berio (1990)

Brin begins with a musical figure containing five pitches. The second figure is a variation of the first, and similarity is the idea that connects them (see Figure 3).

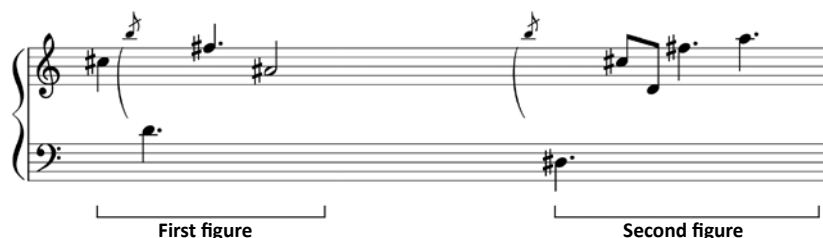


Figure 3. *Brin* by Berio. Schematic representation of the two first figures (similarity)

However, the second event is also the beginning of a directional segment. Directionality results from the chromatic saturation technique, i.e., the progressive introduction of all twelve chromatic pitches until the twelve-tone scale is saturated. In other words, after introducing the first musical event containing five different pitches, the other seven pitches that complete the twelve-tone scale appear one by one. No order is required, as it happens in dodecaphonic music, and repetitions are allowed. When the last pitch is introduced the work finishes (or it finishes just after that), or another chromatic saturation starts. In the case of *Brin*, it finishes. Note that in this analysis, the fast-ornamental pitches are considered a sound effect. So, they are not considered in the chromatic saturation.

The progressive introduction of all chromatic pitches makes the harmonic relations more complex, the number of different pitches increases and the persistence of the same figures accumulates, stressing directionality. In addition, all pitches are frozen in their registers (that is, each pitch always appears in the same octave) so that the chromatic saturation becomes clearer. Besides, Berio uses a limited set of musical figures in this work, but their arrangement never creates repetitive patterns. So, we listen to them as isolated musical figures, not phrases, directing our attention to the color changes and increased harmonic complexity produced by the chromatic saturation. In *Brin*, the complete sequence of chromatic saturation is presented in Figure 4.

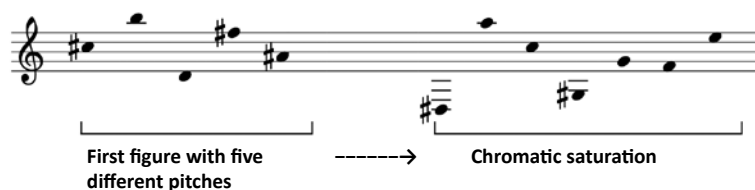


Figure 4. *Brin* by Berio. The chromatic saturation (directionality)

The last pitch in the chromatic saturation is an E, and the directionality could finish here. However, Berio stresses the final E one more time, like a confirmation, and simplification starts just after it. The simplification begins with a chord including the same five pitches that open the work, recapitulating the beginning.

However, the synthesis Berio uses is not a shared convention, which is why he borrows a cadence formula from tonal music, stressing the key pitches related to E, that is, A, B, and E (i.e., IV, V, and I). That explains why the upper B goes to E four times in systems five and six, suggesting a traditional cadence on E.

Figure 5 summarizes this borrowing. The A appears just before the E that concludes the chromatic saturation, and the B appears just before the E that is a confirmation. The simplification starts with four Bs followed by an E (an appoggiatura). Afterward, the B happens again, and the final E concludes the work. Note that the two last Bs are played with a D# in the bass, reinforcing the idea of a tonal cadence. This work is not tonal. However, it uses borrowing from tonal music to construct the simplification, and performers could stress these relations to make them more audible and more teleological.

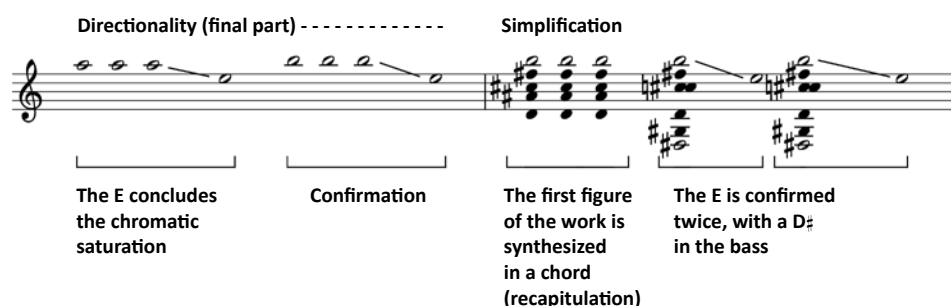


Figure 5. *Brin* by Berio. Schematic representation of the final part of the directionality and simplification

3. Final comments

The results show that similarity, directionality, and simplification ideas explain musical intelligibility and teleology in traditional and contemporary music. The analysis of contemporary works confirms that intelligibility does not depend on motives and one single musical system to create unity and coherence. Instead, these are musical resources to express the fundamental ideas of similarity, directionality, and simplification at the musical surface level (foreground). The more these ideas are transparent at the surface level, the more a teleological result is perceptible. In the first ten measures of Schnittke's String Quartet No. 3, they are expressed at the surface level, making teleology more transparent. In addition, the excerpts selected to compose these ten first measures agree with the similarity, directionality, and simplification ideas, reinforcing them. This reinforcing is so strong that this excerpt may sound like one organic musical sentence instead of a polystylistic collage without a unifying motive and a uniform musical system. However, in Berio's work, directionality and simplification are not much at the surface level. As a result, teleology is less transparent. However, it is striking to see how the chromatic saturation technique matches the directionality, and the scheme of a tonal cadence (a borrowing) reinforces the conclusion in the simplification. Obviously, the expression of teleology at the surface level is not a criterion of musical quality.

Finally, musical figures, techniques, and conventions (like borrowings) can match similarity, directionality, and simplification ideas. These matchings can be seen as representations, like Beethoven's excerpt representing directionality in Schnittke's work. Representation in music is a complex issue, including different approaches (Delalande 1996, Tagg 2013, Tarasti 1994, Zamprónha 2000). However, this is a promising research field to be better studied using similarity, directionality, and simplification ideas, opening new approaches to music studies inside multimodal contexts, including multimedia works and sound arts.

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Semiotinis muzikos teleologijos aiškinimas remiantis muzikos suvokimu

Santrauka

Pagrindinė straipsnio idėja – muzikos teleologija glūdi ne pačiame muzikos kūrinyje, o klausytojo sąmonėje, kai klausytojas transformuoja girdimus garsus į kažką, ką gali lengvai suvokti. Trumpai tariant, kai klausomės muzikos kūrinio, mes susiejame tai, ką girdime, su kažkuo mums gerai suprantamu, taip įnešdami idėjų, kurių nėra pačiuose muzikiniuose įvykiuose. Taigi pagrindinis šio tyrimo uždavinys yra identifikuoti tas idėjas. Peirce'o semiotika čia tampa pagrindiniu teoriniu atspirties tašku. Anot jo, šios idėjos iš viso yra trijų rūšių ir įvardija jas kaip *panašumą*, *kryptingumą* ir *supaprastinimą*. Sakydami, kad du ar daugiau muzikinių įvykių yra panašūs, mes sukuriame jungtis, kurios tuos įvykius sintezuoja ir padaro suprantamus. Sakydami, kad muzikiniai įvykiai turi tam tikrą kryptį ar reiškia kažką konkrečiau, mes juos kognityviai sujungiamo. Galiausiai, redukuodami muzikinius įvykius iki muzikinių konvencijų, mes taip pat paverčiame juos suvokiamais. Šiame kontekste *teleologiją* galime suvokti kaip tam tikrą supaprastinimą. Teleologija – tai tarsi galutinis tikslas, pritraukiantis prie savęs ankstesnius muzikinius įvykius. Tai yra tarsi atskaitos taškas, kuriuo remdamiesi mes galime protu suvokti tai, ką girdime.

Norėdami patikrinti, ar šios idėjos gali paaiškinti sudėtingesnius tonalios muzikos kūrinius, šiame straipsnyje analizuojame pirmąsias visų 32 Beethoveno fortepijoninių sonatų temas. Rezultatai rodo, jog, be kelių išimčių, visos temos sudaro muzikinį sakinį. Pažymėtinos dvi išimtys – tai 28-oji ir 30-oji sonatos. Tradicinės muzikos formos analizė jas paaiškina ganėtinai „negrabiai“ arba nepaaiškina apskritai. Tačiau panašumo, kryptingumo ir supaprastinimo idėjos, išplėsdamos tradicinę muzikos analizę, gali jas nesunkiai paaiškinti. Siekiant patikrinti, kaip tai pritaikoma netonaliame repertuare, analizuojamos dvi šiuolaikinės kompozicijos: Alfredo Schnittke'ės Styginių kvartetas Nr. 3 (dešimt pirmųjų taktų) ir Luciano Berio *Brin*. Schnittke'ės kūrinio ištrauka aiškiai rezonuoja su panašumo, kryptingumo ir supaprastinimo idėjomis, jos dar labiau sustiprinamos. Tas sustiprinimas yra toks galingas, jog visa ištrauka gali nuskambėti lyg vienas organiškasis muzikinis sakinytis, o ne daugiastilistinė atkarpa be vienijančio motyvo ir bendros muzikinės sistemos. Berio kūrinyje matome įspūdingą chromatinės saturacijos technikos ir kryptingumo idėjos sutapimą, o tonalių kadencijų schema yra naudojama supaprastinimui, kad sustiprintų užbaigtumo pojūtį ir pačią teleologiją. Vis dėlto kadencijos neskamba tonaliai. Šią procedūrą galima vadinti *skolinimusi*. Tyrimo rezultatai byloja, jog panašumo, kryptingumo ir supaprastinimo idėjos gali paaiškinti muzikos suvokimą ir teleologiją tiek tradicinėje, tiek šiuolaikinėje muzikoje. Kartu atskleidžiama, jog suvokimas nėra tiesiogiai priklausomas nuo motyvų ir vienos muzikinės sistemos sukuriama koherentiškumo. Būtent *panašumas*, *kryptingumas* ir *supaprastinimas* paviršiniame muzikos lygmenyje sustiprina teleologijos suprantamumą.

2

TELEOLOGINIAI PROJEKTAI ŠIUOLAIKINĖJE MUZIKOJE	TELEOLOGICAL PROJECTS IN CONTEMPORARY MUSIC
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Differences and Similarities in Approach to Teleology in Symphony No. 1 and Symphony No. 3 by Hanna Kulenty

Abstract. In the binary distinction between *a composition as a state* versus *a composition as a process*, the works of Kulenty may generally be classified as the latter. However, the musical language of Kulenty since her debut in the eighties has been evolving, developing and undergoing various modifications that have been affecting also the composer's approach to teleology. The dates of creation of the two works presented in the following paper, Symphony No. 1 and Symphony No. 3, are separated by 12–14 years, and therefore fall under two different periods in Kulenty's artistic evolution. Symphony No. 1 is one of the pieces of the early period and is an example of Kulenty's predominant teleological strategy at the time. It is based on an individual technique named by the composer herself as "the polyphony of arcs", the stylistic results of the technique being constant tension, high level of dramatic expression and continuous forward movement in pursuit of the culmination. Symphony No. 3 was composed in the middle period, the style of which the composer herself called "European trance music." Kulenty's style of that time includes a turn towards stasis and repetitiveness, derived from Eastern and minimalistic influences. The following paper's objective is to determine the degree of difference and resemblance exemplified by those two symphonies in terms of approach to teleology. The theoretical framework for this research is 1) the concepts of Jonathan D. Kramer (1988) and Dorota Krawczyk (2007), however, it should be pointed out, that it is Kramer's view, with its emphasis on the coexistence of linearity and nonlinearity (as opposed to Krawczyk's clear distinction between "process-compositions" and "state-compositions") that is particularly adequate for the analysis of Kulenty's music.

Keywords: teleology, Hanna Kulenty, symphony, linearity, nonlinearity, process.

1. Introduction

Hanna Kulenty, a Polish composer born in 1961, is considered one of the most interesting artistic personalities among the composers of her generation. Having debuted in the second half of the 1980s, she instantly gained recognition not only in Poland but also abroad. Since then, she has built a very successful artistic career. Her compositions have been performed at numerous concerts and festivals, mostly in Poland and in the Netherlands, which are the two countries considered by the composer as her home, but also in other European countries, as well as in the USA and Australia. Her musical language is considered strongly individualistic and its most recognizable characteristics are the pervasiveness of strong dramatic tension, the "sharpness" or "coarseness" of orchestral timbres (especially in the early works), often due to the use of tone-clusters, the density of multi-layered texture and the repetitiveness of rhythm.

As is the case of virtually every composer, the music of Kulenty is not homogenous in terms of style and compositional techniques, and it has been evolving throughout the years since the composer's debut in the eighties. This evolution has impacted also a change in the teleological aspect of the discussed compositions. Two compositions that are discussed in this paper—Symphony No. 1 (1998) and Symphony No. 3 (1998–2000)—represent two different periods of Kulenty's artistic evolution. This paper explores these two symphonies in terms of their differences, resulting from this stylistic change, and similarities, stemming from their common idiomatic ground.

2. The style and compositional techniques in Symphony No. 1 and Symphony No. 3

There are three distinct phases in the evolution of Kulenty's style and compositional technique:

- 1) early phase—ca. 1984 to 1993–1994—"polyphony of arcs";
- 2) middle phase—ca. 1993–1994 to 2001—"trance in European music";
- 3) late phase—after 2001—"polyphony of time dimensions" (Trochimczyk 2003)¹.

Thus, Symphony No. 1 belongs to the early period, while Symphony No. 3 is one of the final works of the middle period.

It is significant that this periodization, as well as the terms applying to each phase, is proposed by the composer herself. Kulenty belongs to those artists who have formulated a comprehensive reflection upon their work. Since the very beginning, she has developed a strong interest in the issue of time and parallel temporalities. As a result, the polyphony of arcs technique was born. The technique is based on the superimposition of

¹ Since 2016, Kulenty has been using a new term for her music—*musique surréaliste*; however, it is still too soon to tell whether or not this should be considered the beginning of a new phase.

several arcs, which are distributed within a multi-layered texture and each of them is developing separately and independently.

An arc is a “structure of emotions”, in Kulenty’s own words, and it is constructed in such a way that it might, at least in theory, have the potential to constitute an independent musical piece (Kulenty 1992: 24). It should be thus understood rather as a layer developing in parallel to other simultaneous layers, than as a separate formal unit being a part of sequential order, however, a succession of arcs is also possible. The arcs may begin (or end) at any point of their trajectory and proceed at various paces (Trochimczyk 2003). The overlapping and the superimposing of arcs, with their climaxes occurring non-synchronously, cause the effect of a “permanent culmination”, as explained in the following description of the technique provided by Dorota Szwarcman (Szwarcman 2007: 83):

... each consecutive arc is beginning while the previous one has not decreased yet, various events are overlapping, and, since what is the most perceptible are the climaxes, the listener may get the impression that the piece is a continuous, uninterrupted culmination².

In its middle phase, Kulenty’s musical language evolved in what the composer called “trance in European music” or just “trance music”. The seeds of “trance” aesthetics had been present already in early compositions, those that were based on polyphony of arcs.

The following questions served as a starting point for the new stylistic phase: what would happen if the multiplicity of layers were left behind, and what remained as a focus were just one, two, three arcs expanded to the limits of perception? The exploration of this idea resulted in a significant textural simplification, reduction of the number of layers, and therefore, the reduction of the number of arcs. One of the characteristics of Kulenty’s music in its middle phase is the rhythm based on ostinato pulsations, meant to put the audience into trance and to cause a cathartic effect. It is mostly this kind of rhythm that is the reason Kulenty’s music is sometimes considered post-minimalist. However, those minimalist elements are not traced to American minimalists, but rather to the music of some non-European cultures, especially Indian and African music (Trochimczyk 2003; Kulenty 2000: 8).

Despite the ostensible stasis, the music of Kulenty, created in the middle phase, has still retained a relatively high extent of dramatic expression, which seems to be an idiomatic characteristic of her musical language, regardless of a particular phase, or technical details.

Discussing her style during this phase, Kulenty noted,

My pieces are now simpler in structure, more “ear-friendly” and suspenseful. I have always had this objective of creating an impression of trance through my music. I think that now, after many years of experiments, I have achieved that goal (Kulenty 2000: 8)³.

3. Composition as a process versus composition as state

Dorota Krawczyk (2007), classified Kulenty among composers, whose works represent what the author calls a *composition as a process*, as opposed to a *composition as a state*⁴. Krawczyk’s study develops the idea of opposition to those two types of musical temporalities.

The author defines a *process-composition* as

a situation in which the subsequent phases of the composition, due to the specific construction of the music matter (events) build the dramaturgy of the piece (action) which is characterized by a clear time-frame set by the beginning and the end of the composition (striving) (Krawczyk 2007: 69)⁵.

² “... kolejny łuk rozpoczyna się w momencie, gdy jeszcze nie opadł poprzedni, różne zdarzenia nakładają się na siebie, a ponieważ kulminacje są najbardziej zauważalne, słuchacz może odnosić wrażenie, że utwór jest jedną ciągłą nieprzewaną kulminacją.” Translated by Agata Krawczyk. See also notes 3 and 5 etc.

³ “Moje utwory są teraz prostsze w strukturze, bardziej «dla ucha» i trzymające w napięciu. Celem, jaki zawsze sobie stawiałam, było stworzenie poprzez muzykę wrażenia transu. Sądzę, że po wielu latach eksperymentów udało mi się to osiągnąć.” Translated by Agata Krawczyk.

⁴ As those literal translations of the original Polish terms *kompozycja jako proces* and *kompozycja jako stan* don’t sound equally smooth in translation, synonymic variants of the terms: a *process-composition* and a *state-composition* will be used interchangeably.

⁵ “Kompozycja-proces jest wielofazowa, zaś kolejne fazy „poprzez określoną konstrukcję materii dźwiękowej (zdarzenia) budują sens dramaturgiczny dzieła (akcja) o wyraźnych ramach czasowych wyznaczonych przez początek i koniec kompozycji (dążenie).” Translated by Agata Krawczyk.

A specific feature of *process-compositions* according to the author, are the phases following each other consecutively, one leading to another in terms of musical logic and dramaticism:

The melodies, the themes, the notes are sounding because they have come into being, they have emerged from non-existence—therefore they have appeared from the future. But as soon as they become a being, they go by, leaving the scene of the present and giving way to new melodies, new themes, new notes (ibid.: 70)⁶.

Although one may argue that this characteristic may apply to nearly all Western music, from the earliest historical periods to the present times, it should be considered that the author uses this term in a particular circumstance, namely in reference to specific styles, techniques and individual idioms that are present in the output of some 20th-century composers. The purpose is to distinguish them from the tendencies of the opposite nature (such as attempts at the disruption of linearity or even avoidance of linearity), which became a significant part of artistic experiments and explorations in the music of the 20th century.

On the contrary, a *state-composition* is defined as a

... Situation, in which the repetitiveness (circularity) of the musical material is constituting an un-dramatized, lasting existence, through an act of contemplation evoking the feeling of timeless being (122)⁷.

While experiencing this kind of music, the listener does not feel any kind of striving towards a goal. The point of a *state-composition* is not a pursuit of a goal, but “just being for us and in us” (122). This kind of music is “conflict-less, non-dialectic, un-dramatized and non-teleological”:

This kind of music is unfamiliar with any relationship with time whatsoever – neither conflict nor compatibility. This music is ungrateful, so to speak, as being born from time, it kind of ignores it. However, this is an illusion ... As a matter of fact, this music does not negate the time, it just discovers another truth about it—it denies the linearity, finiteness and tripartite structure of time, whereas it defines time as an eternal present (155)⁸.

Interchangeably with the terms a *process-composition* and a *state-composition*, some other expressions are used by the author. A *process-composition* may also be referred to as *processual music* or *progressive music*, while a *state-composition* is related to a *periodic* or *circular* concept of time and may also be called *circular music*.

The differences between those two types of music may be considered in several aspects: form, material, structure, energy, movement and perception (see Table 1).

	Composition as a process	Composition as a state
Form	closure fulfillment defined timeframe (beginning and ending) irreversible internal order	open internal structure superficial role of the beginning and the ending
Material	variability multiplicity diversity	homogeneity or limited diversity
Structure	variation transformations contrast	repetitiveness reprise limited contrast
Energy	increasing – culmination – fading out	lack of tension homogeneity
Movement	motion event process	lack of events or processes
Perception	memory expectation passing	liberation from the forms of time consciousness (memory, expectation, passing) contemplativeness

Table 1. The characteristics of a composition as a process and a composition as a state

⁶ “Melodie, tematy, dźwięki, rozbrzmiewają dlatego, że powstały, że wyłoniły się z niebytu, przyszyły – a więc zjawily się z przyszłości. Lecz zaledwie stały się bytem przechodzą, schodzą ze sceny terażniejszości, ustępując miejsca nowym melodiom, nowym tematom, nowym dźwiękom.” Translated by Agata Krawczyk.

⁷ “sytuacja, w której powtarzalność (kolistość) materiału muzycznego konstituuje od dramatyzowane trwanie, wywołując w akcie jego kontemplacji poczucie beczasowego istnienia”. Translated by Agata Krawczyk.

⁸ “Takiej muzyce obcy jest w ogóle jakikolwiek stosunek do czasu – walka, czy zgodność. Jest – można by powiedzieć – niewdzięczna, bowiem będąc z czasu zrodzoną, jakby go wcale nie zauważa. Lecz złudny to pogląd [...]. W rzeczywistości muzyka ta nie neguje czasu, lecz odkrywa inną prawdę o nim – zaprzecza jego linearności, skończoności i trójdzielności, a mówi, że jest on wieczną terażniejszością.” Translated by Agata Krawczyk.

The distinction between a *composition as a process* and a *composition as a state* bears some resemblance to the concept of Jonathan D. Kramer and his classification of musical time built around the question of linearity and nonlinearity. However, according to Kramer, the term process should not be identified only with linearity; he points out one specific kind of music maintaining nonlinear time (namely vertical time), which is based on process and therefore tends to be considered linear. This kind of ostensible linearity can be found in minimal music (Kramer 1988: 55).

As Kramer has strongly emphasized, although the term nonlinearity seems to be a direct opposition to linearity these two terms do not negate each other. According to Kramer, nonlinearity should not be understood just as a “lack of linearity”, since it is an independent constructional force, operating on its premises and being capable—just like linearity—of generating its own rules and tendencies. Therefore, there is a difference between the ideas of Kramer and Dorota Krawczyk as to how their typologies function in musical works. Kramer states that linearity and nonlinearity coexist in every musical piece to different extents, in different ways and different proportions. Krawczyk, on the other hand, tends to treat *processuality* and *circularity* as different concepts of music that hardly ever can be observed within the same piece and illustrates those concepts with examples from two different sets of composers, among which she also includes Hanna Kulenty.

And, while the classification of Kulenty’s compositions under the category of processual music is well-founded, it does not cover all the subtleties of their teleological aspect, especially since the composer’s approach to time and its perception has undergone some changes throughout the years of her artistic evolution. It should not be overlooked that not only linearity but also nonlinearity has a significant impact on the teleological aspect of Kulenty’s works, especially those from the middle phase. Therefore, Kramer’s approach, with its emphasis on the coexistence of linearity and nonlinearity within one musical work provides an adequate framework for the analysis of Kulenty’s music.

4. *Processual versus circular in Symphony No. 1 and Symphony No. 3*

In Symphony No. 1, just like in other compositions of Kulenty from the early period, the succession of increase, climax and decrease, regarding any musical parameter (sometimes without the phase of decrease, or instead without the phase of increase) is the basic structural unit. The overall impression projected by this music is one of an uninterrupted continuum, with no internal sections. Internal divisions are observable only on the level of macro-form and perceived as phases rather than sections, as they evolve smoothly from one to another (as opposed to the succession of separate entities). The boundaries of subsequent phases tend to blur, as what often seems to be the ending of one phase serves as the beginning of the next phase. This kind of “chain” approach to relations within the musical form has a strong impact on the sense of linearity. Although there is no doubt that this music “feels” linear, the goals towards which the music is proceeding are difficult to determine. This difficulty is due to the fact that, as observed by Kramer (Kramer 1988: 33–40), the concept of goal is related mostly to cadences—even if those cadences were contextual, rather than a harmonic construct. The lack of cadences and closure at the end of structural units results in the “loss” of the sense of goal arrival, even if the preceding musical processes imply the existence of a goal.

What strongly suggests that Symphony No. 1 belongs to the type of *process-composition* in terms of musical form, is a clearly defined timeframe. The beginning and the ending of the piece are strongly emphasized, the former through a high level of energy as if the piece was starting from a culmination (a typical feature of early works of Kulenty), the latter by the long fade-out phase. The other characteristics of a *process-composition*, like closure and goal arrival, are weakened by the lack of cadences and ambiguity of borders of structural units, however, they are still present to some extent due to several clearly outlined global culminations.

The internal structure within the phases, as a result of the superimposition of multiple asynchronous layers, tends to be ambiguous. The layers, coexisting within a specific phase, are spread over wide time spans, and their structure shows little to no subdivisions. Therefore, within the phases, a tendency to uniformity is observable. There are no gestures, no distinct motifs, no internal structure, just the endless continua, proceeding each at their own pace. As the layers’ beginnings and endings are asynchronous, on this micro-formal level, the internal structure becomes more obscure, and the sense of fulfillment/closure more difficult to perceive. The diversity of musical material within a specific layer and the timeframe of a

specific phase are strictly limited. Although the coexistence of multiple contrasting types of material is not excluded, it occurs in the vertical dimension, that is, between different simultaneous layers. However, what prevails inside one layer is mostly homogeneity and repetitiveness, although, not without some level of variability or transformation. Then, it may be concluded that, in this work, the characteristics of the *processual music* and the *circular music* are well-balanced in terms of the musical material.

In the absence of phrases and their potential relationships, including some kind of cadences, it is the organization of material in its contextual parameters that becomes the carrier of linearity and processuality. The sense of directionality, development and progress is achieved by organizing various musical parameters including pitch, rhythm, loudness and tempo through what I propose to call a “gradual process”.

A very simple example of a gradual process regarding the pitch is a melodic movement based on an ascending (or descending) scale. As noted by Kramer (1988: 173), a stepwise melodic movement is an important means of linear progression, especially in non-tonal compositions that are lacking a goal-oriented harmony. It provides a sense of progress and direction, even if the ultimate goal is yet unknown.

The gradual way of organization may nevertheless concern not only the pitch but also other musical parameters, like loudness or rhythm or tempo. If the changes applied to the parameter sustain the same direction (e.g. “louder and louder”, “faster and faster” etc.), it provides the overall sense of directionality just as much as in the case of stepwise movement in melody.

The substantial role of this kind of organization in Symphony No. 1 results from the basic premise of the compositional technique found in this, as well as other Kulenty’s early works: the features of the arc itself, both as a geometric shape and as a concept, involve the linear change. In Symphony No. 1, gradual processes concerning the pitch element assume the form of ascending or descending passages of several types:

- based on the chromatic scale,
- based on different, including composer’s original, scales,
- based on a microtonal scale,
- based on glissandi.

Regarding the rhythmic aspect of the piece, the “value” prone to the gradual change is not a single duration, which would make the rhythmical structure almost impossible to recreate for the performers, but the density. The process involved is, therefore, one of the rhythmic “thickening” or “thinning.”

As mentioned before, the lack of distinct rhythmical motifs, models or groups is typical of the rhythmical structure of Kulenty’s music. Instead, the rhythm is based on ostinatos and repetitive pulsations. The irregular divisions—mostly triplets, quintuplets and sextuplets—create a wide range of densities that would provide steps for the gradual process.

The balance between the material’s uniformity and variability is usually achieved by combining homogeneity for one parameter and a gradual processing for another parameter (for instance, a succession of thickening rhythmical densities performed on the same pitch, or an ascending melody with rhythm, based on a single-duration ostinato).

The third structural dimension, superimposed over pitch and rhythm, is dynamics. It is the parameter that plays a significant role in exposing linear features in the aspect of energy. The dynamics is one of the most important factors in creating tension, building up to a culmination and providing a fade-out afterward. The loudness changes in Symphony No. 1 are achieved both by detailed specifications of dynamic levels for each group of instruments and by the instrumentation factor, e.g. by a “textural crescendo” achieved by adding more and more instruments. Again, to create as many as possible “steps” for the gradual process, the orchestral instruments are treated almost as solo instruments, and with large use of *divisi* in the string section. Having the instruments joining in one by one allows to approximate full linearity much closer than adding whole groups. A typical use of this procedure is in cluster chords in the strings that are introduced gradually through the “textural crescendo” mentioned above, “filling in” up to a full cluster—also demonstrating how gradual processes may operate harmonically and timbrally.

The intriguing aspect of Symphony No. 1, as well as of some other works from the early period, is the aspect of tempo. Throughout the piece, several subsequent tempo changes are introduced (see Table 2).

Bars	Tempo (verbal instructions)	Tempo – MM (quarter-note related)	Direction of change (in relation to previous tempo)
t. 1–37	[no indication]	66	
t. 38–66	Più mosso	80	↑
t. 67–98	Più mosso	92	↑
t. 99–102	Meno mosso	80	↓
t. 103–118	Più mosso	96	↑
t. 119–160	Più mosso	108	↑
t. 161–190	Più mosso	126	↑
t. 191–199	Più mosso	132	↑
t. 200–217	Meno mosso	108	↓
t. 218–293	Più mosso	126	↑
t. 294–340	Più mosso	132	↑
t. 341–354	Meno mosso	66	↓
t. 355–383	Meno mosso	48	↓

Table 2. Distribution of tempo in Symphony No. 1

Those tempo changes are rather small; in most cases, the difference in metronome units (MM) is between 8 and 24. Perceptively, this would translate into the impression that the basic metric pulse is gradually thickening or thinning. The thickening or thinning of this primary, a tempo-related pulse may be viewed as another “temporal layer” superimposed over the thickening or thinning of the rhythmic pulsations.

At the same time, tempo fluctuations provide an ultimate, overall arc for the entire musical form. Although those fluctuations involve changes in both directions (from slower to a faster tempo as well as the opposite) and in detail, their succession may resemble a sine curve, an overall tendency, prevailing in the whole work, may also be observed: throughout the first half of the composition, the tempo is generally increasing, then having reached the climax, it experiences a temporary setback only to establish the climax again. After the second climax, the tempo drops down abruptly. However, the impact of this arc is blurred by the rhythmic pulsations in the foreground, which are disrupting its perception.

The tempo-governing processes are the most striking embodiment of teleological thinking in Symphony No. 1, as the goal of all this development is clearly defined: it occurs at a tempo of 132 MM, the fastest tempo used in the piece. The unambiguity of this goal is the result of the fact that the tempo is prevalent in all simultaneous layers. This arc-like model of tempo succession speaks to the irreversible order of the musical form, which is precisely a characteristic of *process*-compositions.

For the gradual processes operating within other musical parameters, the recognition of goals is not that simple. Despite what might be anticipated from the direction in which the process is going, the ending point does not always conform to the predictions. Goals may change in the making; what seemed to be a goal while a particular gradual process was unfolding, may eventually turn into a starting point for a new gradual process, especially if a different musical element takes over. Moreover, for many processes, a clear goal-moment never arrives.

This kind of linearity, with its ambiguity of goals and, at the same time, a clear sense of direction in which the music is proceeding, may be called, after Kramer, nondirected linearity (Kramer 1988: 46). This term signifies the absence of unequivocal and clearly perceptible goal-moments, but not the lack of direction during the process.

Symphony No. 3, composed in 1998–2000, consists of three movements (as opposed to Symphony No. 1, which is a single-movement composition). Its first movement, composed in 1998, was published separately and performed under the title Part One.

The clearest exemplification of the difference between this piece and the previously described Symphony No. 1 is the organization of tempo. While Symphony No. 1 contains a sequence of tempo changes, Symphony No. 3 displays a more traditional approach, where the tempo is constant within each movement. The only exception is the third movement, which involves a tempo change, however, the character of this change, from a slower tempo in the introductory phase to the actual, faster tempo is also well-rooted in musical tradition, even more specifically in symphonic tradition.

The stability of the primary, tempo-related pulsation showcases the general premise of this composition—simplicity. The fact, that the complex multi-layered structure has been avoided—or at the very least, strictly limited—has a great impact on the clarity in terms of structure and dramaticism, since it makes any fluctuations of dramatic tension much more perceptible and easier to follow.

Along with the simplification of texture comes the simplification of rhythm in the vertical dimension. Again, the abandonment of polyphony has significantly restricted the polyrhythmic tendencies. Once there is no need to differentiate simultaneous layers by their rhythmical qualities, the pulsation may serve a new purpose, which is putting the audience into a trance. The trance-evoking role of rhythm determines the rhythmical features in horizontal dimension—the repetitiveness within large timespans, the preference for ostinatos and the limited range of rhythmical durations in use, without duplets. It is particularly prominent in the middle movement, with its extreme extent of rhythmic simplicity and uniformity. It is wholly pervaded by homogeneous quarter-note pulsation. This characteristic positions this movement closest to the specifics of *a composition as a state*, even if not in regard to the whole form, then at least within some local timespans, especially those, where there is no melodic movement and the pitch organization is based on repetitions as well.

Although gradual processes have very little impact on rhythm, they still operate in melody to some extent, especially in the first part, where ascending and descending melodic passages still play an important role. Just like in Symphony No. 1, in Symphony No. 3 there are no motifs, no phrases or cadences. The structure of this music is based rather on the succession of continua, coming to life and passing without leaving a distinct image in the listener's memory. It is consistent with the aesthetics and the philosophy of trance, as the essence of this experience is a result of liberation from time consciousness and memory, and being only “here and now”. The exception occurs in the last movement, where Kulenty utilizes a distinguishable motif with evident melodic qualities, although, still minimalistic in nature. The motif initializes a canon, which is gradually building up, leading to the culmination, thus representing the composer's linear approach to musical form.

Furthermore, the form of this symphonic cycle may be interpreted as a symptom of linear thinking. The three-movement structure involves tempo relations reminding those typical of the traditional fast-slow-fast model of the symphony. This kind of symphonic form demonstrates the characteristics of *process-compositions*—a clearly defined timeframe and irreversible internal order.

5. Differences and similarities between Symphonies No. 1 and No. 3 in terms of approach to teleology

The comparison of the two symphonies presented above leads to the conclusion that, as for their teleological aspect, both differences and similarities may be observed.

In Symphony No. 1 the gradual processes govern the construction of the composition, both on a general level and levels of micro-form, whereas in Symphony No. 3 the impact of gradual processes is limited, and dominance is given to trance-evoking repetitiveness, especially regarding rhythm. Therefore, if the typology of *a composition as a process* and *a composition as a state* were to be treated as a spectrum, Symphony No. 1 would be placed on this spectrum much closer to the former than Symphony No. 3. Symphony No. 3 displays some clear characteristics of the second type, *composition as state*—repetitiveness, a tendency to homogeneity, some moments of stasis.

As Symphony No. 1 is the one that is a product of a “culmination-oriented” technique, the next conclusion may seem a little bit ironic: due to multi-layered texture, the directions in which the music is proceeding and the placement of the goal-moments (if present at all) is sometimes unclear to the listener due to the dominance of, in Kramer's terms, nondirected linearity. On the other hand, in Symphony No. 3, any symptoms of striving towards a goal are very clearly noticeable due to the more transparent texture, in which a goal-oriented process may develop without the competition of other simultaneous processes. For that reason, the distribution of tensions throughout the piece feels much more defined.

Nevertheless, the teleological characteristics of those two symphonies are not completely different. Although more prone to stasis, Symphony No. 3 to some extent shows the linear, goal-oriented even, dramaturgy as well. On the other hand, an overall tendency to trance-evoking repetitiveness is also common to both symphonies. While in Symphony No. 3 the repetitiveness is rather apparent, in Symphony No. 1 it is hidden, concealed by the dominance of gradual processes and, therefore, linearity. But it still may be sought on another level. The constant motion constitutes an underlying stasis. In fact, Symphony No. 1 may be more static than one might predict from the premises of the polyphony of arcs technique.

This only proves that the juxtaposition of *a composition as a state* versus *a composition as a process* should be treated as a spectrum rather than as a binary opposition. The music of Hanna Kulenty is a perfect example of the problem described by Jonathan Kramer when linearity and nonlinearity coexist in one musical piece, and they both have a significant impact on its temporal structure.

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Teleologinių sprendimų panašumai ir skirtumai tarp Hannos Kulenty Simfonijos Nr. 1 ir Simfonijos Nr. 3

Santrauka

Hanna Kulenty (1961) – lenkų kompozitorė, laikoma viena iš unikaliausių savo kartos kompozitorių asmenybių. Jos karjera nuo pat debiuto 1980-ųjų antroje pusėje buvo itin sėkminga ir kompozitorė pelnė tarptautinį pripažinimą.

Dvi šiame straipsnyje aptariamos kompozicijos – Simfonija Nr. 1 ir Simfonija Nr. 2 – yra parašytos atitinkamai 1986 ir 1998–2000 metais. Jos reprezentuoja du skirtingus Kulenty kūrybinės raidos etapus. Per šiuos metus Kulenty kūryboje įvykę kompozicinių technikų, stilistinių ir estetinių prioritetų pokyčiai neaplenkė ir teleologinio aptariamų kompozicijų aspekto.

Simfonija Nr. 1 atspindi ankstyvąją Kulenty kūrybinės raidos fazę, kai kompozitorė išstobulino individualią komponavimo techniką, kurią pati vadina „arkų polifonija“. Simfonija Nr. 3 iliustruoja raidos vidurinį periodą, tuomet kompozitorė pasinėrė į naują, pasak jos, „europietiškos transo muzikos“ stilistiką.

Dorotos Krawczyk muzikinio laiko studijoje (2007) Kulenty muzika buvo įvardyta kaip *kompozicija kaip procesas* (priešpriešinant sąvokai *kompozicija kaip būseną*). Pagrindinė *kompozicijos kaip proceso* charakteristika – į tikslą nukreiptas progresyvumas, giminingas žmogiškam laiko tėkmės pojūčiui. *Kompozicija kaip būseną* yra apibūdinama kaip „neteleologiška, nedramaturgiška egzistencija“, esanti „amžinoje dabartyje“. Šios dichotomijos kontrastai turi nemažai panašumų su Johnathano D. Kramerio (1988) *linearumo* ir *nelinearumo* koncepcija.

Linearumo pojūtį Simfonijoje Nr. 1 užtikrina arkų polifonija, nes ši Kulenty technika yra paremta individualių muzikinių arkų sluoksniavimu. Nesant aiškių linearų koherentiškumą įprasminančių formos padalų, frazių struktūrų ar kadencijų, pagrindiniais linearumo „nešėjais“ tampa aukštis, ritmas ir tempas. Linearumo pojūtį čia sukuria siaurų melodinių slinkčių, nuoseklaus ritminio tankio, garsumo ir kitų parametrų kaita.

Nepaisant visų *kompozicijai kaip procesui* būdingų charakteristikų, Simfonija Nr. 1 turi ir *kompozicijai kaip būsenai* būdingų savybių – repetityvumą ir ostinatinę ritminę struktūrą.

Simfonijoje Nr. 3 būtent melodijos ir ritmo repetityvumas yra pagrindiniai „transo“ estetikos nešėjai. Paprastas ostinatinis ritmas sukelia sąstingio įspūdį, nors melodijoje yra ir tam tikrų nuoseklių procesų. Be to, tam tikrų linearaus mąstymo pėdsakų galime aptikti ir struktūriniame kūrinių lygmenyje.

Taigi šių dviejų simfonių teleologijos turi ir panašumų, ir skirtumų. Abiejų kūrinių muzikinę struktūrą valdo tiek dinaminės, tiek statinės tendencijos. Skirtumus lemia tik tai, kokios apimtys dinaminės (pasireiškiančios nuosekliais procesais) ar statinės (pasireiškiančios repetityvumu) jėgos veikia muzikoje. Taigi *kompozicijos kaip proceso* ir *kompozicijos kaip būsenos* supriešinimas turėtų būti traktuojamas kaip spektras, o ne kaip binarinė opozicija. Šiame spektre Simfonija Nr. 1 būtų arčiau pirmojo, o Simfonija Nr. 3 – arčiau antrojo kraštutinio taško. Ši išvada sutampa su Kramerio požiūriu, anot kurio, *linearumas* ir *nelinearumas* koegzistuoja viename muzikiniame kūrinyje, ir tiek vienas, tiek kitas daro reikšmingą įtaką jo struktūrai laike.

Discourse of the Genotype Canon *versus* the 12-tone Technique of Eduardas Balsys' Music¹

Abstract. The article attempts to highlight Eduardas Balsys' (1919–1984) individual contribution to the process of the traditional genotype deformation that has begun in Lithuania – the renovation of the genotype canon and the trends of “chromatisation” (polygenres). It must be admitted that it was Balsys himself who to a large extent initiated these processes in the 1960s. However his philosophy of music composition and his relationship with the “formalized” technological ideology – dodecaphony – was not homogeneous in terms of values. His three most important genotypes of music (opera, oratorio and symphony-concert) were composed using the so-called dodecaphonic technique. Each of the following compositions (*Dramatic Frescoes*, 1965, the oratorio *Don't Touch the Blue Globe*, 1969, and the opera *The Journey to Tilsit*, 1980, produced in 1984) meant new solutions in the Lithuanian music of the 1960s through the 1970s in terms of the application of both traditional genotypes and the 12-tone compositional technique. The article discusses the relationship between the music genotype innovation and Balsys' 12-tone compositional technique, which was new to many Lithuanian composers of the time. Simultaneously, a more general dilemma of an epistemological nature is addressed to differentiate and conceptualise the two 20th century atonal music compositional techniques, such as dodecaphony and 12-tone atonality. The present article addresses the discussion of the so-called dodecaphonic music of Balsys in correlation with his innovation of the music genotype canon. The issue to be considered is whether it is correct to apply the term dodecaphony to Balsys' method of atonal music composition.

Keywords: music genotype, mixed genotype, twelve-tone technique, dodecaphony, Balsys, oratorio, opera, concerto-symphony.

In the mid-1960s, the work of Lithuanian composer Eduardas Balsys was particularly innovative: for the first time (also in Lithuanian music), he wrote a composition characterised by such a high level of hybridity. In his “intentional hybrid” (Mikhail Bakhtin's concept), a triad of music genotypes interacted. It was a complicated, and rather rare, model of a double concerto (for violin and piano), a 5-movement symphony cycle, and a symphonic poem genotype. The somewhat risky, yet simultaneously original, genotype mix made its first public debut of Balsys' so-called dodecaphony. Although in many cases the harmony of *Dramatic Frescoes* sounded like atonal music of the 20th century, the intonation potential of the two 12-tone series generated thematicism of the opus; the intonations of the basic series as if *Kopfmotive* pervaded the most important parts, and they were freely developed.

When interpreting the hybrid of *Dramatic Frescoes* in terms of the formal structure determinants of the triad of music genotypes, the analysis raises the most important arguments of the represented genres. The symphony was based on conflict dramaturgy, the unity of the sonata cycle, as well as the main and secondary themes exposed in movements 1 and 3 and developed in all parts of the cycle. The concerto genotype was represented by two soloists: the violin and the piano, although they sounded like orchestra-complementing timbres, and there was a lack of vivid *solì* – orchestral dialogues. The symphonic poem was presented by generalised programmatism. “Intentional hybrids” and the trend of writing authorial genotypes of opuses in the 1970s and 1980s got later established in Lithuania as one of the basic parameters of the manifestation of composers' creativity. This was evident in the compositions of Julius Juzeliūnas, Bronius Kutavičius, Osvaldas Balakauskas, and others. The conclusions of the analysis presuppose the insight that the construction of the original music genotype and the modernisation of compositional techniques were perceived by Balsys as complex interdependent creative factors. This relationship is explored in the article from the perspective of both the music genotype and the epistemology of the compositional techniques.

Balsys' philosophy of music composition and his relationship with the “formalized” technological ideology – dodecaphony – was not homogeneous in terms of values. His dodecaphonic opuses can be seen as a refinement of the relation with dodecaphony and the accumulation of experience in works through applying the experience of the twelve-tone technique series construction and technical inventory. It is also necessary to note the fact that Balsys' addresses in the 1960s through the 1970s with repeatedly expressed opposition to the rationalisation of music writing cannot be automatically attributed to the evaluation of dodecaphony. Balsys' arguments from the rostrum of the 6th Congress of the Lithuanian Composers' Union in 1971 meant prob-

¹ Project “The Evolution of Lithuanian Music Culture (1970–2020) in a Typological Approach: from Deformation to New Phenomena”, funded by the Lithuanian Research Council, No. S-LIP-19-71, 2019-04-30.

ably an evaluation of Juzeliūnas' attitude and compositional system, especially since they were set out against the background of debates over the latter's doctoral (presently habilitation) dissertation *On the Structure of the Chord* (1972). Balsys' more intimate confessions to colleagues (Jurgis Fledžinskas) could have meant his evaluation of dodecaphony: "I don't want to be forced to write what I don't like at all, even though it would be good for the sake of 'mastery'"². The music "freezing from a rational glance" and losing its expressiveness (Th. W. Adorno) did not respond to the sound of Balsys' inner music. In the music thus constructed, he saw more than one danger, and first of all, the threat of "cold" rationalism. As a proponent of free composition, he was skeptical about the "engineering" construction of music, although he could not avoid it in the process of writing his opuses, which significantly modified the natural essence of Balsys-composer. The creativity of an impulsive intuitionist, pervaded by rationalism, enabled him to apply more modern defining metaphors in his work. Although Balsys declared the paradigms of the aesthetics of Romanticism as the greatest values – spontaneous intuitivism in creation, expressive thematicism in composition, an organic form of its development, and dramaturgy – an intersection with the intellectual control of the twelve-tone technique made it possible to consider Balsys' works as the cases of expressionism in Lithuanian music.

An analysis of his three scores reveals the change in Balsys' approach to dodecaphony. Despite the ongoing persecution of dodecaphony, in his *Dramatic Frescoes* (1965), a typologically complex opus (a double concerto-symphony for violin, piano and orchestra), Balsys applied the twelve-tone technique, focusing on the constructive harmoniousness of the series itself and the potential for its transformations and transpositions. The fact that having exercised the twelve-tone technique merely in film music and never using it in small form compositions of art music, Balsys embarked on a musical work, extremely complex in terms of dramaturgy, form, and composition, suggests that he knew the "dangers" of dodecaphony in the "factory-type order" cultural environment. On the other hand, Balsys was ready and mature for that step.

The comparison of the scores of the three most important compositions written by Balsys in a free twelve-tone technique revealed considerable differences in his approach to the canons and possibilities of the dodecaphonic method. In the series of his *Dramatic Frescoes*, which became the harmonic foundation of the melodically exhibited themes, the manner of development was still approaching the method of late Romanticism. The thematicism of the *Mask*, composed in the oratorio in a free twelve-tone technique, and the manner of its development did already integrate some features of postmodernism. The dodecaphony of the opera stood out due to the psychological treatment of personified series and the dramaturgy of the links of their structural elements (sets). It should be added that, in the *Tilsit* series, Balsys recorded certain links between the series of the characters and the sets of the series created in previous dodecaphonic opuses. This suggests that Balsys reflected on his dodecaphonic work as a whole and conceptualised its structural components.

As for Balsys' *Dramatic Frescoes*, another fact is obvious: the year 1965 was still the time of politicisation of dodecaphony in the USSR, and it was perceived as an ideologically foreign, hostile (bourgeois) technique. Its application in the works of a Soviet composer had to be motivated by its association with "the evil"; i.e. the composer's solution had to be "masked" by a program of appropriate semantics (aggression, war, threat, horror, tension, etc.). Balsys masked the idea of *Dramatic Frescoes* with a similar kind of program. In terms of a neutral, non-ideologised attempt to apply dodecaphony, Balsys was overtaken by Vytautas Barkauskas' cycle for piano *Poetry*, started in 1963 (and completed in 1964). Balsys addressed the issue of dodecaphony ideologisation more cautiously. He related his first dodecaphonic opus to the lingering atmosphere of political tension in the 1960s: confusion, inability to change anything in the position of *homo sovieticus*, outbreaks of protest, and gleams of hope. The association of dodecaphony with evil was the only condition for its application legitimised by the "factory-type order" ideology. The five movements connected through the Attacca principle formed a large monocycle, and the free application of the principles of dodecaphony helped Balsys to realise the idea of the monocycle, to create an opus of contrasting states, and to seek unity at the level of monothematicism. The melodic thematicism of the concerto-symphony (1965) and the whole monocycle (Berberov's term) were formed by two twelve-tone series: the first, performing the function of the main theme, in the first fresco, and the second, a quasi-secondary theme, in the third fresco. All the most important themes of

² From Balsys' letter to Jurgis Fledžinskas, Leningrad, 15 December 1951. Balsys wrote about Viktor Voloshinov's, his composition teacher, view of modernity in music, perceived by the latter as the reflection of socially significant topics, for which he valued programmatic music. Balsys rejected Voloshinov's proposal to write a cantata or an oratorio as the final work of his post-graduate studies. Quoted in Narbutienė 1999: 57.

the *Dramatic Frescoes* were derived from the main forms of the two series and their transformations (I, R, IR – inversion, retrograde, and retrograde inversion). Balsys responded to the creative challenge of Barkauskas' *Poetry* by his *Dramatic Frescoes*, a series of symmetrically arranged 4 tritones and 4 major thirds (there were other intervals in-between: two minor thirds, major seventh, minor sixth, and major second). A convincing assumption is that Balsys was already acquainted with examples of Webern series:

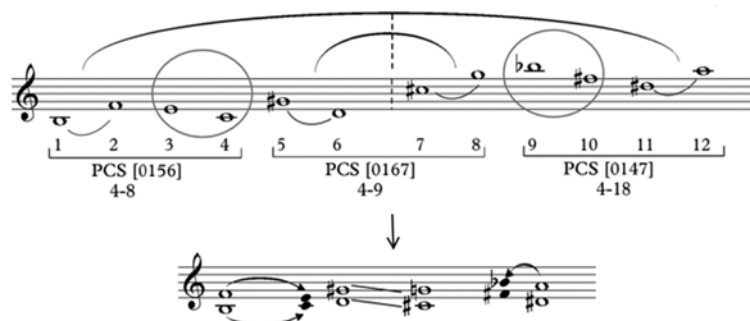


Figure 1. Eduardas Balsys. *Dramatic Frescoes* for symphony orchestra (1965). The series of the first fresco

A constructive series of a symmetric character, the illusion of the “solution” of dissonances (tritones) to consonances, and application of various derivative forms of the series transposition testify to the fact that, by the mid-1960s, Balsys was already well aware of the theoretical foundations of the twelve-tone technique. However, the impression is that, in Lithuania, few scores based on it could be found for Lithuanian composers to be able to study individual interpretations of that technique.

In the series of Balsys, the four tritones arranged symmetrically between the links of major thirds inspire an assumption that such a logic of interval arrangement exhibits a farewell to the tonal system with its functional attraction or the solution model (*b-f* is still solved to *c-e*, the last tritone goes to *e-g*). By the way, Anton Webern constructed his early series in a similar way, and the series of *Dramatic Frescoes* are related to them by the common trait of constructive symmetrism. In the series of *Frescoes*, the central major seventh (the centre) is embraced by two tritones. The second tritone (tones 5–6) parallelly by semitones moves to another tritone (tones 7–8) (*g#-d* ↔ *c#-g*), however, the tritones of the second half of the series are already moving away from the tonal attraction, or the “obligation” of a solution, and slightly destroy the ideal constructive order. Thus, the relation of tones 7–8 and 11–12 (tritones) can be seen as another case of tritone parallelism, this time ignoring the traditional solution model. A symmetrical chain of the minor (tones 8–9 and 10–11) and major (tones 9–10) thirds embedded between them not only moves away from the tonal proto-image but also helps to establish a higher degree symmetrism of the series.

How does the series continue to function in the *Dramatic Frescoes* monocyte? Balsys focused on the structure of the series, identified its segments and thematicised them, and the latter functioned as quasi-motifs in the monocyte. Already in the stage of pre-composition, during the construction of the series, Balsys undoubtedly sketched the outlines of the most important thematicism of *Dramatic Frescoes*. He wrote about his method of composition: “I write several, a dozen, variants in a draft and also use theoretical calculations, but I choose the final variant by ear. The model performed by a musical instrument must match the experienced one. I usually outline the score in five or six lines, when I already see the parts of all the instruments quite clearly” (Balsys, in Narbutienė 1999: 173). The dual compositional process had to convince the composer of a symphonic nature that the technique of dodecaphony had indubitable advantages – it could inspire a creative search and ensure the thematic unity of a large symphonic opus.

Balsys' evaluation of the dodecaphonic technique would be close to Schönberg's view of dodecaphony being a new method for constructively organising the melodic and harmonic (vertical and diagonal) resources of atonal composition. The idea of “the air from another planet” (*Luft von anderen Planeten*), which emanates from Schönberg's modern utopia, was the idea of rationally pre-formed compositional material (*vorgeformtes Material* – the concept Th. W. Adorno³ and a precondition for further development of its structural code.

³ Theodor W. Adorno. *Ästhetische Theorie. Gesammelte Schriften*, in 20 Bänden, Band 7. Frankfurt am Main: Suhrkamp Verlag CmbH und Co, 1970: 222.

In the first fresco, the series (the main theme) gradually penetrates the orchestral instrumental parts in a linear way, and afterwards into harmony. The relation of Balsys with the paradigm of dodecaphony is clearly illustrated by the main theme exhibited in the first fresco (*Allegro moderato assai*), in the violin solo part in the rhythm of rumba⁴. The five-tone segment of the first series, exhibited in the violin solo, soon begins to be developed in a Beethovenian manner, ignoring Hauer's law of non-repeating tones in the twelve-tone series, established as early as in 1919:

Figure 2. Eduardas Balsys. *Dramatic Frescoes* (1965). The first fresco, the main theme of violin solo, score pp. 11–12

⁴ The Lithuanian folk song *Oi teka, bėga vakarinė žvaigždėlė* [The Western Star is Rising and Moving] in the rhythm of rumba was already used in Balsys' Concerto No. 2 for violin, in the second movement Scherzo (1958).

This reveals the essential features of Balsys' "free" dodecaphony: Balsys does not stop treating the segments of the series (expressed in my analysis as sets⁵), which appear in various transformational forms in the monocycle, as the "basic motifs". In the score, the latter are developed by traditional methods, rejecting the example of Webern's sterile structural constructivism (meaning Webern's Symphony Op. 21, Variations for Piano Op. 27, etc.). Thus, Balsys' dodecaphonic compositions are dominated by a clearly expressed melodic element and symphonic development of the thematic material.

The model of the *Frescoes* polygenre (a mix of double concerto, symphony and symphonic poem) in Balsys' understanding of dramaturgy, the conception of the sonata cycle, required the opposition of two thematic blocks. It has to be admitted that various musicologists had been looking for the second theme in *Frescoes*. Thus, Algirdas J. Ambrazas only hinted at the existence of the second theme, but never identified it, while Mindaugas Urbaitis in his analysis looked for the second theme in the second fresco. However, he did hesitate when he wrote: "The theme of the second fresco is not based on the tone row of the series, although some intonational relationships with it can be found (cf. number 19, bar 6 of the violin part and number 19, bar 1 of the main theme). The central tone of the secondary part is *f*, which is accentuated already in the first bar" (Urbaitis, in Narbutienė 1999: 216). Observed at the level of the monocycle and its harmonic logic, the second fresco in Balsys' dramaturgy is assigned the function of a link (*Gang* – the concept of A. B. Marx) between the main and secondary theme. However, a new series is exhibited in the third fresco (*Allegro energico*), and its final segment (PCS 4-z29) overlays also other dodecaphonic opuses by Balsys (see the analysis of the opera in Appendix 3):

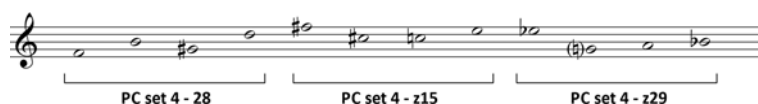


Figure 3. Eduardas Balsys. *Dramatic Frescoes*, movement 3, *Allegro energico*, series 2

Emerging in harmony (strings) and the piano part, tetrachord 4-z29 of the second series becomes the central one in Balsys' opera *The Journey to Tilsit*, linking the series of Indrė and Anas. Like Igor Stravinsky, Balsys attached importance to both the first and the last segments of the series.

Elena Jokūbonienė's point of view seems to be the most convincing in the dispute over the search for a secondary theme in *Dramatic Frescoes*. The second theme, including the second series of the opus and its forms of transformations, was explored in her paper *Dodecaphony in E. Balsys' Dramatic Frescoes*, published in the *Menotyra* journal, Vol. 3, in 1971: 62⁶. The "square" of the transpositional forms of the series, characteristic of the 12-tone technique composition analysis, was also presented.

In his presentation given in Moscow, at the conference "On Supposed and True Innovation in Contemporary Music" at the end of December 1965, Ambrazas noted: "In my opinion, the most valuable thing in Balsys' work is the constructive synthesis of the emotional and the rational elements"⁷. The transition from the third to the fourth fresco was pointed out as the most emotional fragment of the composition (there the series and all its variants sounded in the violin solo part). Similar to other opuses of the early dodecaphonic period of Lithuanian music, the series in Balsys' *Dramatic Frescoes* usually sound in a solo part (the melodic voice), although accompanying voices are created from the series segments and their variants, often also from other atonal harmonies. Thus, in the first dodecaphonic work of Balsys, the features of the primer of dodecaphony were evident as well as an undisguised portion of controversy in his artistic relationship with the technique. The melodic element, characteristic of Balsys' work, and the ambition of symphonic development of the thematic material were preserved. Another conclusion from the analysis of *Dramatic Frescoes* can be formulated as a controversial statement that, in the said monocycle, Balsys' approach to dodecaphony can be interpreted as his confidence in the twelve-tone technique, although in the 1960s and the early 1970s Balsys made public statements to the contrary.

⁵ Based on Babbitt-Forte set analysis structure and methodology. See Milton Babbitt. Set Structure as a Compositional Determinant, *Journal of Music Theory*, V/1, 1961: 72–94. Allen Forte. *The Structure of Atonal Music*, London: New Heaven, 1973; 2-nd ed. 1977.

⁶ See Elena Jokūbonienė. Dodekafonija E. Balsio „Dramatinėse freskose“ [Dodecaphony in E. Balsys' Dramatic Frescoes], in: *Menotyra*, Vol. 3. Vilnius: Mintis, 1971: 51–72.

⁷ See Algirdas Jonas Ambrazas. *De musica*. A collection of research articles and papers, ed. by Gražina Daunoravičienė. Vilnius: Lietuvos muzikos ir teatro akademija, 2019: 51.

* * *

A typical composition of the period of Balsys' national modernism and application of dodecaphony was the oratorio *Don't Touch the Blue Globe* (1970). The dodecaphony in that opus continued the tradition of acoustic symbolisation of negative images, established by Schönberg in his work *A Survivor from Warsaw* Op. 46 (Ein Überlebender aus Warschau, 1947), dedicated to the destruction of the Warsaw Jewish ghetto. In accordance with the theme, Schönberg created an atmosphere of horror, shock, and catastrophe. The adequacy of compositional means was recognised even by ideologists of socialist realism. In his oratorio, however, Balsys expanded the circle of modern means of composition, applied in the 20th century, by introducing sonorism and the method of limited aleatoricism⁸. The latter was seen as an opportunity, a way to unleash the creativity and initiative of performers "without imposing composer's own personality".

In the overview of Balsys' relation with dodecaphony, in the case of his oratorio *Don't Touch the Blue Globe* (1969), he further individualised that relation both in terms of modernisation of the folklore interpretation and the twelve-tone technique. The first issue was discussed in detail by Algirdas J. Ambrazas in the paper *National Specificity of Eduardas Balsys' Music*⁹; Ambrazas emphasised that "almost all the thematism of the oratorio is closely related to folklore through various methods of its application – from precise quotation to the use of individual folklore elements" (Idem.: 125). It would seem that the studies of the twelve-tone technique also modified Balsys' compositional treatment of folklore material. The change of his mindset was demonstrated by an old harvesting folk song *The Western Star is Rising and Moving*¹⁰ in the existential-form oratorio. While in the second movement (*Scherzo*) of his Concerto No. 2 for violin and orchestra (1958) Balsys avoided quotation of socialist realism and strongly modified the rhythmic parameter of melodic segments, in the oratorio, the forms of the musical substance of *The Western Star* largely imitated the generativeness of the series, i.e. initiated the musical material of the "folklore" sphere. In the oratorio, the song sounded like a quasi-series (a quote), variants were derived from it, and it was verticalised in harmony. Balsys acknowledged similar intentions when talking to Hannelore Gerlach: "I seek to link elements of folk songs with modern compositional methods" (Narbutienė 1999: 204). However, should we look for the Lithuanian folklore element in the *Mask* series, I would single out its final tetrachord (PCS 4-24) because its Lydian shade (in a raised 4th scale degree) sounds in Lithuanian polyphonic multipart folk songs *sutartinės* and the music for folk wind ensembles.

Although the dissonant essence of the *Mask* twelve-tone series (see Fig. 4) in the oratorio was associated with a negative image of the "destroyed / dead city", from a compositional point of view, that series was much more diatonic than the segments of the *Frescoes* series; its constructive plan became more diatonic and weakened. The series was formed by the first tetrachord (PCS 4-17), the harmonic content of which could be deciphered as simultaneously sounding major and minor triads (*c-e-g + es*) and two related tetrachords (PCS 4-24). Possibly, both tetrachords (sets) in Balsys' drafts, as he himself admitted, were sketched many times and tested as the first one became one of the most important motifs of the opera *The Journey to Tilsit* (1980):

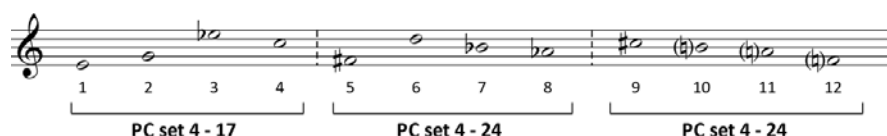


Figure 4. Eduardas Balsys. Oratorio *Don't Touch the Blue Globe* (1970).
The series of the *Mask of a Destroyed City*

The aria *I am the Mask of the Destroyed City*, grown from the retrograde version of the *Mask of the Destroyed City* series, was already composed by Balsys on the basis of postmodern philosophy of creativity and opposed the "orderly exposition" of the twelve-tone series in accordance with the Hauer-Schönberg's doctrine of dodecaphony. Balsys further perceived the series as Schönberg's *Grundgestalt*, or a motif; in that structure,

⁸ See Rūta Naktinytė. Aleatorika kai kurių lietuvių kompozitorių kūryboje. *Menotyra* 6, 1976: 115–117.

⁹ See Algirdas J. Ambrazas. Eduardo Balsio muzikos tautinis savitumas [National Specificity of Eduardas Balsys' Music]. *Algirdas Jonas Ambrazas: Muzikos tradicijos ir dabartis* [Musical Tradition and the Present], ed. by Gražina Daunoravičienė. Vilnius: Lietuvos kompozitorių sąjunga, 2007: 112–131.

¹⁰ It had already been included in the second movement of Balsys' Concerto No. 2 for violin (1958).

he identified the first four or five tones and afterwards treated them as a thematic core. The *Mask* aria was based on the crab segments of the series: the final and the central segment (PCS 4-24) sounded in minimalist “loops” (x 8), and tones *a* and *b* (x 2)¹¹ were repeated in transposition, while the initial segment of the series (PCS 4-17) was also exhibited in a retrograde form (see App. 1).

While observing such ways of the thematisation and development of the *Mask* series in the oratorio, one could dispute the widespread statement in Lithuanian musicology about statics and the repetitiveness of the minimalist technique being unacceptable to the compositional method of Balsys; as Narbutienė wrote at the time: “He found statics, minimalism, or strongly emphasized chamber character unacceptable” (Narbutienė 1999: 123). Moreover, in the late 1960s, post-serialist techniques had already reached Lithuania through the hermetically sealed cultural border. In Balsys’ oratorio, next to the freely interpreted twelve-tone technique, other creative trends were already concentrating – the aforementioned minimalism, neofolklorism, sonorism, and the technique of limited aleatoricism. The revision of folklore interpretation as well as the integration of free dodecaphony and new postmodernist techniques in Balsys’ composition were based on an emotionally perceived totality of expression: “I coordinate nascent innovations with my own needs”, the composer admitted (Vyliūtė, in Narbutienė 1999: 175).

* * *

Before starting work on his opera *The Journey to Tilsit* (1980, staged in 1984), Balsys emphasised the links between his three most important dodecaphonic works: “I seem to have invested almost all the knowledge I have accumulated so far in that work (opera – *G. D.*). It is like a quintessence of what I have achieved in the oratorio *Don’t Touch the Blue Globe* and in *Dramatic Frescoes*, and I hope very much that the work will live”¹². Another common thing between the three most important dodecaphonic opuses by Balsys was the fact that all of them rested on conflict-based dramaturgy. That was one of Balsys’ beliefs. Another belief of his never changed in his career as a composer: “Priority must be given to emotions because music is the art of emotions. The mind is a regulator” (Vyliūtė 1980). As it is well-known, the latest period of Balsys’ relationship with the twelve-tone technique was associated with the process of composing the opera *The Journey to Tilsit* in the late 1970s and the early 1980s; however, it did not move Balsys to a more radical renewal of his work. As he himself admitted, he created “in accordance with all the rules of writing a musical work”. Nonetheless, it is interesting to observe how the conflict-based dramaturgy, melodism, emotions, and the twelve-tone technique collided in the score of Balsys’ opera.

Balsys had admitted thinking about an opera¹³ for a long time, but he was hindered by the absence of a proper plot. Finally, the plot¹⁴ of Hermann Sudermann’s long story *The Journey to Tilsit*¹⁵ proposed by Jonas Mackonis turned out to be acceptable, and it served as the first impetus for writing an opera. Balsys had considerable requirements for the plot of an opera, which he had expressed earlier: “In opera, I believe only in great passions, extraordinary characters, and dramatic heroes. In opera, everything is on a grand scale, hyperbolised, and enriched with pathetics – that is predetermined by the text which is not recited but sung” (Mikšytė 1973). The second strong impetus was Mikhail Tarakanov’s book *The Alban Berg Musical Theatre*

¹¹ The repetition of individual motifs in Balsys’ composition was provoked not by minimalism alone, but also by the Beethovenian – Tchaikovskian aesthetics of development. Obviously, Balsys frequently repeated individual syntactical elements (motifs) both sequentially and in loops in his opuses, created by various compositional techniques.

¹² Rūta Gaidamavičiūtė. Kokybė – tai atranka, 1979 (in Narbutienė 1999: 142).

¹³ Balsys’ view of the opera is illustrated by his statement: “It is indeed one of the most difficult synthetic genres. Quite a few people want to bury it and argue in favour of the need of looking for a new replacement; more than one composer write musicals or rock operas. And I am convinced that good opera will never cease to exist and will attract and excite audiences in all times. Quoted in Eduardas Balsys. *Opera – amžinas žanras* [Opera is an eternal genre]. *Nemunas*, 1981, No. 3.

¹⁴ In the opera, Balsys used Sudermann’s text and the lyrics of two folk songs taken from Part 3 of *Lietuviškos dainos* [Lithuanian Songs] by Antanas Juška, while Indrė’s monologue (Scene 2, Act 1), Ansas’ monologue, and their love duet were rhymed by Justinas Marcinkevičius.

¹⁵ The plot of the opera: A nice family – Indrė, Ansas, and their three children – lived in a fishermen’s village. Their life changed with the appearance of a hired girl named Bušė. Bušė turned Ansas’ head and talked him into drowning Indrė when sailing to Tilsit by the Nemunas River. Bušė’s plan failed as on the way to Tilsit Ansas realised that his wife Indrė was the most remarkable woman. However, as a storm broke out, Ansas drowned. In 1927, a screen version of Sudermann’s long story appeared (director: German Friedrich, script: Carl Mayer, producer: American William Fox (founder of FOX Film)). At the first Academy Awards Ceremony in 1928, the silent film *Sunrise: A Song of Two Humans* received as many as three awards: for a unique film of high artistic merit, for the best female role (actress Janet Gaynor), and for best cinematography (cameramen Charles Rosher and Karl Struss. Based on the information at: <https://www.silutesknygininkai.lt/silute/zudermanas->

(1976), the first research into Berg's operas in the USSR¹⁶. The third impetus was the study of the scores of both Berg's operas, *Wozzeck* and *Lulu* (1935, the premiere in 1937), borrowed from Moscow (the Composers' Union or from Tarakanov personally), by his own method. Those were his professional and intellectual assets. As believed by Balsys' former student Audronė Žigaitytė-Nekrošienė, he could have done that analysis in 1978, but he never said a word about it either to his students or colleagues¹⁷. For the analysis in the composition class, he would bring the clavier of *Wozzeck*, sold at the time at the Nata bookstore¹⁸. The fact confirmed a well-known truth that composers-intuitivists generally avoided discussing the rituals of preparation for music writing or the methods of its rationalisation applied in their work.

Both the concept of music modernity and Berg's creative attitude were undoubtedly close to Balsys. David Ewen defined the essence of Berg's dodecaphonic work by several key statements and argued that "he added more 'human values' to the twelve-tone system and his work was seen as 'more emotional' than Schönberg's" (Ewen 1952: 20). For the studies of other composers' scores, Balsys had developed a specific method – not merely to listen and watch, but also to rewrite them by hand. Audrius Balsys said that his father "never relied on his ear. He would rewrite the scores by hand and thus analyse them: ears and eyes were not enough. He was convinced that only by handwriting could he grasp the essence"¹⁹. When Balsys was preparing to write an opera, he was most interested in Berg's conception of dodecaphony: the series and their functioning in opera, their generativeness and the creative process itself. The scores (manuscripts) of Berg's both operas, hand-written and analysed by Eduardas Balsys, presently stored in the LLMA stock No. 122, b. 380 (*Wozzeck*) and b. 381 (*Lulu*), testify to his preparations for writing an opera and his method of analysis. In that case, Balsys' study of compositions meant rewriting the score by hand while analyzing the harmonic structure of the work and numbering the transformations and tone sequences of the twelve-tone series in different colours (see App. 2). Balsys' method of studying scores was based "not on learning 'by ear, but on hand-rewriting and analysis: in that way, he used to "merge with the creator" (Audrius Balsys) (Ibid.).

As it had been testified, Berg's opera *Wozzeck* forever remained an ideal opera for Balsys; therefore, when working on his opera, Balsys did not renounce "formalist" methods. For the development of its musical dramaturgy, Balsys used the contrasting of the aesthetics and compositional means of various types of music tested in his previous opuses: folklore, popular music, and dodecaphonic music. From that viewpoint, one can discern the junction and dynamic development of the complexes of means of the modal, tonal, and atonal spheres. Coming together as contrasting poles, they provoked the collision of the dramatic process – they created the conflict, stimulated its dynamic development, developed into the climax, and programmed the denouement. In terms of harmonic structure, the compositional dramaturgy of the opera was based on the semantic opposition of harmonic systems.

The items of Scene 3 of the opera (*Ballad about the Seagull*, *Song about Tilsit*, and the gallop) were based on the popular music paradigm and the tonal system. Meanwhile, the domestic episodes of the opera were pervaded by structural elements of Lithuanian folklore. Indrė's lament-monologue²⁰ on existential human issues *I will no longer sing songs* in Scene 1 was to be recognized as an interjacent mix of folk and atonal professional (art) music: such an approach was suggested by the genesis of the vocal part. Indrė's lament was constructed from the main segments-sets of her and Anas's series (PCS 4-z29 and PCS 4-17), cf. Fig. 5 and Fig. 6. From the structural point of view, the monologue-lament sounded in a couplet-variant form characteristic of folklore, further intensifying the eight stanzas by ritournelles (... *I will weep and lament, lament, lament* ...).

¹⁶ Михаил Тараканов. *Музыкальный театр Альбана Берга* [Mikhail Tarakanov. Musical Theatre of Alban Berg]. Москва: Советский композитор, 1976. A comprehensive analysis of Berg's opera scores was enriched by the studies of a creative process, experiments, creative searches, and dramaturgy. Extensive musical (Wagner, Richard Strauss) and literary (Hamsun, Kafka, Strindberg, Chekhov) contexts were of great value. Balsys was fluent in Russian and German, and also knew English.

¹⁷ Based on the author's interview with Audronė Žigaitytė-Nekrošienė in Vilnius, 10 November 2020.

¹⁸ Rimvydas Žigaitis had a recording of Berg's opera *Wozzeck* (composed in 1914–1922 and staged in 1925) in a vinyl record as early as in 1968–1969; Balsys also listened to *Wozzeck* from that record.

¹⁹ From the author's interview with Audrius Balsys in Vilnius, 10 April 2020.

²⁰ In Lithuanian music, a compositional invariant of heroines' (women) arias-laments has existed for almost a hundred years. Its origins can be traced back to Act 6 of Mikas Petrauskas' opera *Eglė Queen of Snakes*, defined by the author as *grand opera*, staged in Boston in 1924. The vocal part of Eglė, who was mourning her painful fate, was studded with painful seconds, originating from folk laments. Her lament for the murdered Žilvinas was repeated like a ritournelle: *Oh my husband, oh my dearest*. The *ostinato* accompaniment was enriched not merely by the seconds of the lament, but also by the dotted (syncopal) rhythmic figures.

Balsys supplemented the complex of the folkloric means of expression in Indrė's lament-monologue with the authentic lyrics of Lithuanian folk laments, taken from Volume 3 of Antanas Juška's *Lithuanian Songs* (1954) (No. 1222):



Figure 5. Indrė's lament-monologue *I Will no Longer Sing Songs*, Scene 1, Act 1

From a viewpoint of the dodecaphonic technique canon, Indrė's monologue-lament in Scene 1, Act 1, is an obvious example of Balsys' "free technique". The variant-type development of set 4-z29 intonations does not at all resemble classical examples of the twelve-tone technique compositions. Balsys neglects the rules of the dodecaphonic technique, ignores Hauer's requirement for the twelve chromatic semitone sequence, and not only does he freely repeat tones but also begins to develop them as if motifs; he does not apply Klein's proposed ways of transformation of the series or its segments, nor does he abandon the impression of tonal sound forbidden by Schönberg (contours of triads in E_s major, B minor). For the sake of suggestiveness, Balsys violates the regulation of the dodecaphonic technique and subordinates the means to the idea.

Balsys formed the musical material of the prologue and the parts of the opera characters from the twelve-tone series, created to characterise the identities of the main heroes. The plot of the opera and its musical dramaturgy empowered him to create not only contrasting images of the characters but also the intersections of their psychological states. Some experience in the use of the twelve-tone material for modelling different spiritual states had already been acquired from Balsys' experiments in *Dramatic Frescoes*. However, the task of creating the dramaturgical development of the characters in the fatal "triangle" within the opera dramaturgy was much more complicated. Balsys solved this compositional rebus already in the pre-compositional material by dramaturgically linking the characters. He saw such an opportunity in the formalised standard (series) of dodecaphony. One could say that the code of events and psychological links between the opera characters was already exhibited in the matrix of the main characters' series:

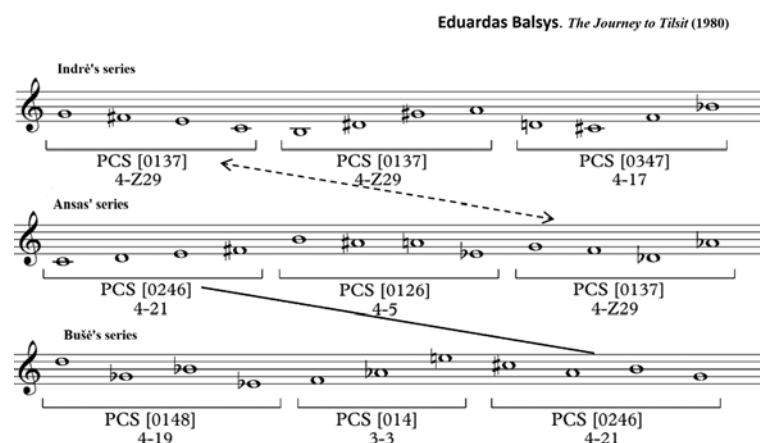


Figure 6. Eduardas Balsys. Opera *The Journey to Tilsit*. The series of Indrė, Ansa, and Buše and links between them

In that case, Balsys filtered the steps of modernisation of his own work through the complex world of subjective experiences of the opera characters. An analysis of the segments of the series, their links, and dispositions revealed the psychological subtext of the storyline events and the relationships between the main characters in the opera. Based on the series matrix, the logic of Balsys' mindset and the compositional process can be reconstructed: the link between Indrė and Ansa's series was encoded by the initial tetrachord of Indrė's series (set 4-z29), which completed Ansa's series; the common set (PCS 4-z29) combined the series of Indrė and Ansa. Simultaneously, Balsys once again manifested the priority of the first and the last segments of the series characteristic of his work, which in that case indicated the relationship and opposition of those

two characters. In the structure of the series of Bušė, the third character, the mark of the sinful relationship between Anas and Bušė was again embossed in that way (common set 4-21). Eleven tones in Bušė's series can hardly be considered a "mistake" by Balsys. It would be conceptually significant from the point of view of Christian numerology. Although the theory was unknown to the USSR musicology during the Soviet era with its aggressive atheism, Balsys could have known the meanings assigned to numbers and marked the negative connotation of Bušė's character with Number 11 (the symbol of sin)²¹. At the same time, attention should be paid to the structural links between the series in his dodecaphonic opuses, which the composer himself had pointed out as a fact, but had not specifically disclosed. When decoding Balsys' hints, we should note that his dodecaphonic opuses analysed in the present study were bound by common sets of series. The common segment of Indrė and Anas' series (PCS 4-z29) had already been exhibited in the *Allegro energico* movement of the *Dramatic Frescoes* or the series of a secondary part as its final tetrachord (see Fig. 4). Meanwhile, the final set of Indrė's series (PCS 4-17) was the initial set of the *Mask* series in the oratorio *Don't Touch the Blue Globe*.

The twelve-tone sonic identity of Indrė, Anas, and Bušė, identified as early as in pre-composition, dramatically enriched the musical material of *The Journey to Tilsit*. In the theme of fate in the prologue of the opera, Indrė's series clashed against the retrograde of Anas' series and the inversion segments of Bušė's series. The segments of the series, signified in a compositional manner, emerged in the score of Balsys' opera as musical metaphors, aposiopesises, or just hints. Balsys rhetorically marked the verbal structures of the opera's libretto with musical structures, and all that taken together "deepened the reading of the text" (A. J. Greimas' wording). The psychological interpretation of Indrė's inner world and the subtexts of her thoughts and feelings as well as of the environment and nature were revealed in the central item of Balsys' opera, in Indrė's monologue *Oh, Dad, Should you Know* in Scene 2, Act 1 (see App. 3). A developed, free-form monologue, however, had features of the three-part architectonics, which were emphasized both by the return of the dominant sets and especially by the semantic divisibility of the poetic text (author Justinas Marcinkevičius). In that case, the middle part of the monologue, the *Andante* fragment *Oh, How Long Ago It Was*, took Indrė back into the world of bright memories; in response, Balsys rearranged the segments of Indrė's set, giving priority to the final tetrachord (PCS 4-17). In the masked, modified reprise of *Allegro focoso* (*I Would Like to Get to Minija*), the dominance of the tragic tetrachord of Indrė and Anas (PCS 4-z29) returned. Balsys rhetoricised its semantic meaning in the reprise by "reading" the verbal meanings of the set (*I Would Weep, Would Weep, Would Weep*); see the *meno mosso* fragment in the reprise of Indrė's monologue (App. 3), analysed employing set-theory.

The analysis revealed that Indrė's vocal line could be seen as generating dissemination of both segments of her series (4-z29 and 4-17). The function of decoding the subtext both in the monologue and in the whole opera was assigned to the orchestra, and the composer himself hinted at it: "An orchestra in a contemporary opera could be a commentator, or a kind of a "secondary plan" in the dramaturgy of the musical work or in episodes, or could create the background for action by means of colourful timbral spots, etc." (Mikšytė 1973). Such a conception of the orchestra was realised in *The Journey to Tilsit*. Balsys' orchestra in *The Journey to Tilsit* created a picturesque landscape and "accompanied" the vocal parts as well as decoded the psychological subtext of action and thoughts. Thus, in Indrė's monologue, one could hear and observe how, at the beginning of it, in the *Allegretto* fragment of the score, the tetrachords of Bušė (PCS 4-19) and Anas' (PCS 4-5) series interlocked in the rippling "waves" of the Minija River, while in the pre-reprise *Lento* section, the musical symbols of Indrė (PCS 4-z29) and Bušė (PCS 4-19) collided. Of course, Balsys stood out among Lithuanian composers as a connoisseur of a symphony orchestra and a master of orchestration. As he said, he wrote the score during the creative process, not when orchestrating the clavier. Thus, the development of orchestral dramaturgy took place simultaneously with the composition of the main material of the opera²². Balsys' creative search would usually take place in various parameters of the art of sound.

²¹ See Tobias Gravenhorst. *Proportion und Allegorie in der Musik des Hockbarock. Untersuchungen zur Zahlenmystik des 17. Jahrhunderts mit beigegefügttem Lexikon*. Europäische Hochschulschriften, Reihe XXXVI, Musikwissenschaft, Bd. 138. Frankfurt am Main: Peter Lang, 1995.

²² In order to get to know orchestra and its dramaturgy, during his post-graduate studies, Balsys was re-wrote Richard Strauss's symphonic poems by hand; noting that Strauss could be his "teacher", he showed them to his students. Audronė Žigaitytė testified to the fact in an interview with the author on 10 November 2020. I would also like to note that Richard Strauss's symphonic poems were rewritten by hand also by Mikalojus K. Ciurlionis in Leipzig. Another example: after listening to Jean-Michel André Jarre's

The significance of Balsys' orchestra as the performer of the harmonic vertical function was also defined by its relation with the solo voices emanating from the series. Following the rule characteristic of Balsys' dodecaphonic opuses, the series was mostly exhibited in solo parts, linearly, and implanted in an atonal orchestral medium. That was the optimal compositional premise for developing the segments of the series as thematicism, "from the inside", growing them as an "embryonic cell" (*Zell*), or a "prime cell" (R. Réti). As early as in his *Harmonielehre* (1911), Schönberg answered the question of how the series or their segments should be harmoniously extended in a composition. After analysing the logic of harmonies in the atonal medium, Schönberg generalised the rule of atonal music as the so-called law of complementarity. He argued that, in a situation of "solution" of atonal harmony, composers used chords that did not contain the tones of the previous chord. That logical principle of atonal harmony basically correlated with Hauer's law on the series as a sequence of non-repeating twelve chromatic semitones, published in 1919, the year of Balsys' birth.

That was one of the fundamental principles of dodecaphony itself, the atonal twelve-tone technique. As revealed by the analysis, in dodecaphonic opuses by Balsys, the harmonic vertical was mostly composed of freely selected chromatic tones of a tone row. In the compositions of Balsys, such generative development of the segments of the series and atonal "accompaniment" were pervaded with features characteristic of all his work, as his aesthetic position did not change substantially. His creative philosophy was the conception of "narrative", "speaking" (according to V. Silvestrov) music, his scores were dramaturgical, rich in contrasts, "programmatic" or cinematic in their own way. From the viewpoint of adaptation of the 20th century modern compositional techniques, Balsys' music was aptly described by Ona Narbutienė, analyst of his work, who admitted that he was a representative of the "middle" position who sought merely limited innovation" (Narbutienė 1999: 126).

Coda

In the analysis of the 20th century musical compositions in which all twelve chromatic semitones of the equal-tempered system function freely, we face the problem of the concept that legitimises the phenomenon. Terminological confusion arises from the fact that numerous well-known scientific sources have traditionally been using the concepts with non-identical content, such as *dodecaphony*, *twelve-tone serialism*, and the *twelve-tone technique*, as synonyms. Although the *twelve-tone technique* can be recognized as broader in scope and capable of integrating the phenomena of the first two cases, its non-delimited narrower aspect raises the issue of deciphering the content of the polysemous concept. It is a theoretical concept that should name 20th-century musical compositions based on the non-dodecaphony canon, which use the totality of 12 chromatic semitones and apply mixed, free, or individual 12-tone continuum techniques. The issue of the conventional concept arises in the works of composers such as Béla Bartók, Nikolai A. Roslavets, Jefim Goly-scheff, Nikolai B. Obukhov, Alexander Scriabin, Igor Stravinsky (works before 1954), Paul Hindemith, Ernst Křenek's (interaction of the 12-tone continuum and 'modal counterpoint'), Geoge Perle (12-tone tonality preserving the pitch hierarchy), Carl Ruggles ('dissonant counterpoint') and many others.

The discussion of the development of 20th century atonal music composition from the viewpoint of the technique of dodecaphony is characteristic of the fundamental works of musicology on the history of 20th century music. There is a clear lack of an equivalent theoretical discourse on the studies of 12-tone compositions of non-dodecaphonic origin. Thus, John Covach's chapter *The Early Development of Twelve-tone Theory, 1920–30*, published in *Western Music Theory* edited by Thomas Christensen (2002: 604–627), virtually eliminates the works of most of the above-named composers from the theoretical perspective through the concept of the *12-tone theory*, except for Křenek and Perle, who are interesting by their creative relationship with the canon of dodecaphony. The issue of Fritz Heinrich Klein's series and their functioning in his paradigmatic *Die Maschine: Eine extonale Selbstsatire* op. 1 (1921) has not been discussed, while it seriously questions the authorship of dodecaphony (Schönberg introduced the new method to his students as late as in 1923). Richard Taruskin provided similar comments²³ on the book *The Cambridge History of Twentieth-Century Music* (2004), where the development of 20th-century music composition was interpreted from two predominant

electronic composition *Oxygène* (1976) in the Lithuanian Composer's Union phonoteque (Vytautas Montvila's office), Balsys soon acquired a primitive synthesizer and included electronics in the third part of the symphonic triptych *Portraits* (1983).

²³ Richard Taruskin. Why You Cannot Leave Bartók's Out. *Studia Musicologica Academiae Scientiarum Hungaricae*, 2006, No. 47/3–4: 269–270. See Rūta Stanevičiūtė. *Modernumo lygtys*. Vilnius: Vilniaus dailės akademijos leidykla, 2015: 256.

viewpoints: as tonal and atonal kinds of music, equated with the development of dodecaphony. Such an approach had taken over the predominant well-established position of *The West*, criticised by the theory of cultural parataxis developed in literature science. It reflected in a simplified way the path of Western music modernisation, rejecting the so-called *The Rest*²⁴, i.e. cases of other cultures and 12-tone compositions of non-dodecaphonic origin. The critical discourse of 20th-century music modernisation should be supplemented by emerging new facts that expand the concepts of both dodecaphony and the 12-tone technique.

The dominance of the forms of “free dodecaphony” in the works of Lithuanian composers had many reasons. On the one hand, that was due to the lack of serious technical studies (because of a shortage of sources and scores), the ideologisation of the compositional technique, and the infiltration of dodecaphony in a “delayed culture” environment. Most composers limited themselves to the exposure of the twelve-tone series, transformations generating from the contrapuntal technique (I, R, IR), transpositions, and vertical layering of segments. In Lithuanian music, as a rule, the series was exhibited at the beginning of the composition and later treated flexibly, even amateurishly; therefore the early twelve-tone technique works of Lithuanian composers were very different from the Western dodecaphonic opuses. Relatively little composer effort had been focused on constructive modeling of the series and deeper semantization. Vytautas Barkauskas’ piece *Reflection* from the cycle *Seven Pieces for Piano* op. 17 (1968) is to be recognized as one of the most classical works of Lithuanian dodecaphony. Serialization of two controlled parameters (tones and durations) was applied in Bronius Kutavičius’ quintet *Clocks of the Past I* (1977); Osvaldas Balakauskas composed using a strictly unique dodecatonic technique²⁵. In Lithuania, V. Barkauskas, J. Juzeliūnas, E. Balsys, V. Montvila, F. Bajoras, B. Kutavičius, V. Laurušas, O. Balakauskas, and others independently studied modern compositional techniques. Those were powerful stimuli for the Soviet-era alternative (informal) music writing. The specificity of the dodecaphonic technique adaptation by Lithuanian composers was also determined by another feature. The time of mastering the technique in Lithuania coincided with the penetrating influence of the *Warsaw Autumn* festivals, from which no less attractive sonorism, aleatoricism, and other avant-garde techniques spread. It was no coincidence that in many cases the works of Lithuanian composers demonstrated “mixed” versions of modernism and avant-garde techniques.

The search for a unique relation of Eduardas Balsys’ compositions with dodecaphony led to the conclusion that, because he never recognised its strict technological standards, his music was approaching a free atonal method. He rejected the path of modernisation of the archaic used by B. Bartók and J. Juzeliūnas, however, proceeded towards composers who in the early 20th century were forming an “integral element” in their works, i.e. cells of intervals which could be transformed into a series without extension and whose individual tone groups generated thematism. Thus, back in 1908, in the *Third Bagatelle* from the cycle of *Fourteen Bagatelles*, Bartók mobilized a group of twelve tones as a generating structure and used it for structural purposes. How was that twelve-tone group different from the series?²⁶ As is known, quite a few composers did not differentiate between the atonal twelve-tone technique (Béla Bartók, Igor Stravinsky) and the dodecaphonic technique. Of course, in 1908, the concept of Hauer’s series (a complex of twelve non-repeating tones) and Klein’s laws of its linear and vertical manipulation had not yet come into being. In other words, the ideas that formed dodecaphony as a method of atonal music in the year of Balsys’ birth were absent.

A question arises whether it is correct to apply the term dodecaphony to Eduardas Balsys’ compositional methods of atonal music in his hybrid double concerto-symphony-symphonic poem, oratorio and opera. The relations between the elements of the dodecaphonic origin and free atonal material as well as the character of the development of the twelve-tone series in his compositions strongly modify the conception of Balsys as a composer of dodecaphonic music. The analysis of the specific relation with dodecaphony as reflected in the compositions of Balsys led to the conclusion that he did not recognise its strict technological standards. His music was approaching free twelve-tone atonal composition, however, the thematism of the so-called dodecaphonic opuses was exhibited in the form of the twelve-tone series. After all, similarly to Bartók, Alexander Scriabin, Igor Stravinsky, Aaron Copland and other composers experimented in the

²⁴ See Susan Stanford Friedman. Cultural Parataxis and Transnational Landscapes of Reading: Toward a Locational Modernist Studies, *Modernism*, vol. 1. Amsterdam, Philadelphia: John Benjamins Publishing Company, 2007: 35–52.

²⁵ See Gražina Daunoravičienė. Compositional System of Osvaldas Balakauskas: an Attempt to Restore the Theoretical Discourse, *Musicological Annual*. LIV/2, 2018, p. 45–95.

²⁶ Stated by Olivier Neighbour in his paper *The Evolution of Twelve-Note Music*, Proceedings of the Royal Musical Association, Volume 81, Issue 1, 1954: 53.

pre-dodecaphony phase. Quite a few of Balsys' contemporaries, such as Witold Lutosławski, or somewhat younger, such as Luigi Nono or Pierre Boulez, did not write dodecaphonic music, however, experiments with that technique contributed to the development of an individual conception of their music writing. The twelve-tone dodecaphonic technique enriched also Balsys' compositional style and made him one of the leading figures among Lithuanian composers – expressionists. Therefore, it seems intriguing to ask a question about the relationship between Balsys' compositions and the technique of dodecaphony and not to expect a final answer. The participants in this discourse are free to formulate their conclusions.

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Genotipo kanono diskursas versus Eduardo Balsio muzikos 12-tonė technika

Santrauka

Reflektuojant Eduardo Balsio gimimo (1919) jubiliejaus šimtmetį ir dodekafoninės technikos įsteigimo Josefo Matthias Hauerio opuse Nr. 19 „Nomos“ (1919) šimtmetį, straipsnyje gvildenama Balsio dodekafoninė kūryba. Kompozitoriaus nuostata šios technikos atžvilgiu nebuvo vienalytė. Jis dairėsi naujovių muzikos mene, kaupė teorines knygas, prenumeravo žurnalus ir studijavo „formalistinių“ technikų reglamentą. Tačiau jo kūrybinei prigimčiai buvo artimesnis taisyklių nesuvaržytas kūrybinis polėkis, racionalios prigimties „sausas“ dodekafonijos technika neatliepė Balsio vidinės muzikos skambesio. Neatsitiktinai dodekafonijai pasiekus Lietuvą (XX a. 7 deš.) Balsys prisijungė prie jos kritikų, tačiau viešam oponavimui savo kūrybinėje laboratorijoje priešpriešino kompozicinius bandymus. Laisva dodekafonine technika, kuri artėjo prie 12-tonės technikos, Balsys komponavo savo etapinius kūrinius („Dramatinės freskos“, 1965; oratorija „Nelieskite mėlyno gaublio“, 1969; opera „Kelionė į Tilžę“, 1980 ir kt.). 12-tonių serijų intonacinis potencialas grindė šių opusų tematizmą, serijų fragmentai persmelkė svarbiausias instrumentines arba vokales partijas. Šių segmentų plėtojimas „Dramatinėse freskose“ ir oratorijoje greičiau priminė laisvą *Kopfmotive* ar bazinių struktūrų plėtoją atonalioje terpėje, t. y. nebuvo sukaustytas griežto dodekafonijos technikos reglamento.

Straipsnyje keliama hipotezė, kad susipažinęs su teoriniais dodekafonijos darbais (Ernsto Křeneko, George'o Perle'o, Bogusławo Schöffierio ir kt.) Balsys, kaip ir daugelis lietuvių kompozitorių, nežinojo pakankamai šia technika sukurtų partitūrų pavyzdžių. Septintajame dešimtmetyje jis tikriausiai nebuvo susipažinęs su klasikiniiais dodekafoniniais opusais (pvz., A. Weberno kūriniai), kurie būtų atskleidę griežtus serijų funkcionavimo kompozicijoje reikalavimus. Santykis su dodekafonija ir serijų funkcionavimo formos ėmė keistis apie 1978 m., kai rengdamasis kurti operą Balsys iš Maskvos pasiskolino ir savo metodu (perrašydamas ranka ir tyrinėdamas) išanalizavo A. Bergo operų („Wozzeck“ ir „Lulu“) partitūras. Analizė pakeitė dodekafonijos traktuotę plėtojant 12-tonę seriją – tai tapo akivaizdu jo operos „Kelionė į Tilžę“ partitūroje. Išvalgus dramaturgas Balsys jau operos prekompozicijoje, serijų intonacinėje struktūroje, įspaudė fatališko trikampio veikėjų sąsajos kodus. Indrės serijos pirmieji segmentai (PCS 4z-29) buvo integruoti Anso serijos pabaigoje, Anso serijos pirmasis segmentas (PCS 4-21) užbaigė Bušės seriją. Vėlyvajam Balsio kūrybos laikotarpiui charakteringas požiūris į dodekafoniją atsiskleidžia operos partitūroje. Taisant seto teorijos analizę straipsnyje nagrinėjamos ir kitų Balsio dodekafoninių kompozicijų serijos, *Grundgestalt* (Schönbergo sąvoka), struktūros daryba ir plėtotės ypatumai.

Vertinant Eduardo Balsio kūryboje atspindėtas savito santykio su dodekafonija paieškas, galima konstatuoti, kad kompozitorius nepripažino griežtų jos technologinių standartų. Jo muzika artėjo prie laisvos atonalios kūrybos, tačiau vadinamųjų dodekafoninių opusų tematizmas buvo eksponuojamas 12-tonių serijų forma. Santykis tarp dodekafoninės kilmės elementų ir laisvos atonalios medžiagos, taip pat Balsio kompozicijoms būdingas 12-tonių serijų plėtojimas stipriai modifikuoja šio lietuvių kompozitoriaus, kaip dodekafoninės muzikos autoriaus, sampratą. Dodekafoninė technika Balsiui padėjo praturtinti savo komponavimo manierą ir tapti vienu iš lietuvių kompozitorių ekspresionistinės kūrybos lyderių. Į Balsio kompozicijų ir dodekafonijos technikos santykį įdomu žvelgti klausiamu žvilgsniu. Šio diskurso dalyviai yra laisvi formuluoti individualius atsakymus.

Appendices

No. 1. Eduardas Balsys. *Oratorio Don't Touch the Blue Globe* (1969, 1970), Winter, Aria of the Destroyed City
Mask *I Am a Mask of the Destroyed City*. A fragment of the score, pp. 85–87.

85

1 tp p pp

2 vf

3 pti ppp mp ppp

5 pti ppp mp p p

mezzo

pf II

я гро_зы во_ен_ной мас_ка, я гро_зы во_ен_ной мас_ка, я гро_зы во_ен_ной мас_ка,
Aš su_griau_to mies_to kau_kė aš su_griau_to mies_to kau_kė aš su_griau_to mies_to kau_kė.

я гро_зы во_ен_ной мас_ка... Я гро_зы во_ен_ной мас_ка!
mies_to kau_kė, mies_to kau_kė Aš su_griau_to mies_to kau_kė!

8- p

8- p

8- p

[No. 1]

86

3/4 48 Adagio

3 pti

5 pti

mezzo

Мас_ка, мас_ка... Нын_че ти _хо. Ночь, как сказ _ка...
 Sian_dien že _mėj bal_ta, bal _ta... bal _ta, bal _ta...

Coro

ДЕТИ Vaikai Children
 Ой, Oi,

3/4

3/4 Adagio

81

No. 2. A fragment of the score from Alban Berg's opera *Lulu* (1935), hand-rewritten by Eduardas Balsys. LLMA, F. 122, ap. 1, b. 381, l. 12a, 13, 14a.

The image displays a handwritten musical score for a fragment from Alban Berg's opera *Lulu*. The score is arranged in two systems. The first system includes staves for Clarinet 1 (Cl. 1.), Alto Saxophone (ALWA), Violins (Viol. 1 and 2), Viola (VI.), and Cello/Double Bass (Vcl. 3 solo). The tempo marking "subito più tranquillo ma quasi a tempo" is written above the Clarinet 1 staff. The Alto Saxophone part features figured bass notation (e.g., 3 4 5 6, 3 4 5 6) and the lyrics "Sah' ich nicht? Frau Haddi! - und rat!". The Violins and Viola parts are marked "poco cresc.". The second system includes staves for Clarinet 1 and 2 (Cl. 1 and 2), Alto Saxophone (ALWA), and Violins (VI. 1 and 2). The tempo marking "BILDHARMONIE" is written above the Clarinet 1 staff. The Alto Saxophone part features figured bass notation (e.g., 3 5 8 10, 4 7 11) and the lyrics "Was ich dich doch nur für meine Hauptrolle an-ga-". The Violins and Viola parts are marked "pizz" and "mp".

[No. 2]

Handwritten musical score for a chamber ensemble, featuring vocal parts (CL, LULU, ALWA), string parts (VI, Vla, Vcl), and a double bass part (Dr. SCH.). The score includes lyrics in German and Lithuanian, and various musical notations such as dynamics, articulation, and fingerings.

CL (Cello): 1, 2, 3 staves. Dynamics: *mf*, *f*, *sp*. Time signature: 4/4.

LULU (Soprano): 1 staff. Lyrics: "ich war da für ihr Stück wohl kaum gut ge-nug tan-zan...". Time signature: 4/4.

ALWA (Soprano): 1 staff. Lyrics: "gla-ven könn-te!". Time signature: 4/4.

VI (Violin): 1, 2 staves. Dynamics: *pp*, *(pizz)*, *mf*. Time signature: 4/4.

Vla (Viola): 1 staff. Dynamics: *arco*, *altri*, *pp*, *pizz*. Time signature: 4/4.

Vcl (Violoncello): 1 staff. Dynamics: *pp*, *pizz*. Time signature: 4/4.

Dr. SCH. (Double Bass): 1 staff. Lyrics: "ich woll-te Dich an meiner Seite - mal - pro-ba - ge - hen - los." Time signature: 3/4.

Archi (Arch): 1 staff. Dynamics: *pp*, *f*. Time signature: 3/4.

[No. 2]

a tempo *poco rit.* *a tempo*

Fl 1/3

Ob 1

CL 1

CL 2

Cor 1

Cor 2

Vibr.

LULU

Dr. SCH

VI 1

VI 2

Vla.

Solo Vcl

Fl 2

Ob 3

Ob 4

Dr. SCH

Solo Vcl

p dolce

aspr.

aspr.

sehr beweglich

un-ke-kan-ten-Wal-sa...-ke-ten

Brust

amp

-fah-ta!

in der marklichen

arco

arco vibr.

sol

aspr.

poco marc

Adriech, darauf nicht einzugehen

zu langsam

Sie müssen Händigung mehr mo-da-lie-ran.

Das Meer - ist sehr sehr.

No. 3. Eduardas Balsys' opera *The Journey to Tilsit*: Indrė's monologue *Oh Dad, Should You Know* from Scene 2, Act 1. Research of the author by the method of set analysis.

АРИЯ ИНДРЕ **INDRĖS ARIJA** 13

из оперы «ПУТЕШЕСТВИЕ В ТИЛЬЗИТ» iš operos „KELIONĖ Į TILŽĘ“

Слова Юст. Марцинкявичюса
Zodžiai Just. Marcinkevičiaus
Русский текст Д. Кыйа Э. БАЛЬСИС
E. BALSYS

Andantino (♩ = 72)

mf

Ах, ро - ди_мый, знал бы ты, как боль_но,
Ах, té - ve - li, jei - gu tu ži - no - tum,

PcS 4z - 29 PcS 4; - 24

mf

знал бы ты, как боль_но, вспо - ми_нать Ин_дре ту до_ро_гу!
jei - gu tu ži - no - tum, koks sun_kus 4-z-29 Ind_rej ši - tas ke_lias!

PcS 4z - 29 PcS 4z - 29

Allegretto (♩ = 80)

mf

4-19 4-5

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3221

[No. 3]

[illegible][illegible][illegible][illegible]

[illegible]

[No. 3]

24

4-229 5-16

Lento (♩ = 48)

25

Andante calmo (♩ = 54)

4-229 4-17

meno mosso

3221

3221

26

Andante calmo (♩ = 54)

4-229 4-229

meno mosso

4-229

27

4-229

meno mosso

4-229

3221

3221

89

30

ud - shts. e - e
 tai ran - kom ii

py - ka - mi
 dy - gleb - chu

H
 tr

mezzo mosso 4-229

4-229

4-229

DAR KATL.
 VET - k - GAB.

DAR KATL.
 VET - k - GAB.

DAR KATL.
 VET - k - GAB.

più mosso

3221

321

Vytautas Barkauskas' Quintet in a Teleological Aspect

Abstract. Uncharacteristically for Barkauskas' creative style, the Quintet for strings and piano (Op. 60, 1980) is a meditative composition that explores the ideas of ethical morality. According to the composer's commentary, the Quintet embodies the idea of the eternal pursuit of spiritual beauty. This study examines the entirety of the Quintet and discusses the composer's choices of the system of images, means of expression and development of sound material. The study shows that the entire development of the Quintet is distinguished by the integrity of the composition and the purposefulness of its idea, which culminates in a philosophical conclusion about the infinity of the process of spiritual perfection aimed at affirming the human need for spiritual community and freedom, as well as the need to rise above the routine of the mundane world. The analysis of the temporal and spatial parameters of the piece, and their connection with semantic aspects of the piece showcases the systems of sound organization, composition techniques and principles of material development that allow the composer to realize his creative idea.

Keywords: Vytautas Barkauskas, Quintet, teleology, meditative composition, transcendental ending, multilayered composition, multidimensional image, complex ternary form, systems of sound organization, composition techniques.

The Quintet for two violins, viola, cello, and piano (Op. 60, 1980) is an important musical composition in the creative legacy of Vytautas Barkauskas. The composer wrote this work on the eve of his 50th anniversary and naturally wanted to convey his sense of life, his thoughts about the eternal and the transient. Here is what



Example 1. Vytautas Barkauskas and the Vilnius String Quartet perform a piece by Barkauskas. Druskininkai, 1980

the composer himself said about the Quintet: "I had a lot of grief in my life. I was looking for inner balance and spiritual beauty. The eternal search for spiritual beauty is, perhaps, the main idea of the composition. I wrote the piano part for myself. I really wanted to play with the String Quartet"¹. The premiere of the Quintet took place in Lithuania (in Druskininkai) on October 1, 1980. It was performed by the Vilnius String Quartet and the composer himself (piano part)². This event is captured in the photograph (Ex. 1).

Therefore, the main idea of the composition is the eternal search for spiritual beauty. This idea is based on several images, or one could more accurately call them musical representations (in a Schopenhauerian sense), which have an intonational harmonic commonality, but belong to different sound systems and are developed differently via a multilayered composition in a complex ternary form. The most important of them are the image of eternity and infinity as well as the image of striving for spiritual beauty.

The image of eternity and infinity is in itself multidimensional. Three components form this image. The first component is the infinite canon of strings, which sparks an association with ancient times. The second component is the sonoric structures in the piano part. They convey the feeling of the vast space of the universe. The third component is the imitation of ringing bells, which signifies the connection with the Creator of the universe.

The beginning of the Quintet introduces us to a medieval atmosphere in a form of an endless canon of the strings. All means of expressiveness highlight its ascetic character and the sense of deep antiquity (Ex. 2).

¹ From a conversation with the composer in 1991: the personal archive, Vilnius, 1991.

² Later the composer performed this Quintet with the Lithuania Quartet and with the Moscow Quartet.

Quintet Vytautas Barkauskas
op. 60, 1980

♩ = 48

Example 2. V. Barkauskas. Quintet Op. 60³

The canon is based on a diatonic scale. The canon's melodic line has a downward direction. It is dominated by a smooth, gradual (without leaps) movement of tones. The main intonation of the canon is the interval of a major second. Slow tempo, quiet dynamics, low register, articulation (*con sord. non vibr.*) all these details help to create an atmosphere of mystery and distant past. However, the canon also contains elements of the classical functional system. For example, the cornerstone pitches of the theme (highlighted in Ex. 3) are in the ratio of a fourth to a fifth. The imitating voice enters at a distance of a fifth.

Example 3. The scheme of the canon scale

The theme of the canon is of great constructive importance, as it is the source of the thematic and harmonious development of the entire Quintet. Main intervals of the theme, such as the major second and the fifth, permeate the sound space of the Quintet. Moreover, these intervals form melodic-harmonic complexes. One of them is a chord of fifths in a formation of a major ninth (Ex. 4a). Another complex is a chord in the range of a minor seventh (Ex. 4b). Both complexes have a great rhythmic and textural variety. The linear sequence of pitches included in these complexes acquires a modal connotation in the Quintet code (Ex. 12).

Example 4. Basic harmonic complexes

The development of the canon undergoes several variations, such as rhythmic changes, expansion of the pitch range, changes of playing techniques or the number of sounding voices. Finally, a transition from a diatonic to a twelve-tone chromatic scale is carried out (mm. 41–50). This variability leads to a change in the nature of the canon and a gradual increase in tension, which “explodes” with a sharp dissonance at the end of the first section (m. 49). Further, the diatonic is replaced by micro-chromatics (mm. 92–96). At the beginning of the reprise, we hear the choral based on the core of the canon's thematic material. Eventually, the entire range of the ensemble is covered as the four-voice canon transforms into a more complex polyphony of four layers.

Starting from bar 15, the canon is supplemented by the second component. It is based on a twelve-tone chromatic scale and is located at a half-tone distance from the seven-step diatonic scale of the canon. The central pitch of the canon is A; the central pitch of the second component is A \flat . In other words, the first and the second components are in a polytonal relation. The second component, which conveys the feeling of the vast space of the universe appears as sonoric structures, at first in the low (Ex. 5a) and then in the high

³ All examples from this work come from the manuscript.

register of the piano (Ex. 5b). The second component is performed in an aleatory rhythm, like the pulsating darkness of the primordial and the heavenly chime of little bells. This contrast is associated with the realms of the mundane and the sacred.

The image shows two staves of handwritten musical notation. Staff (a) on the left includes a piano part with a 'Mando' section and a 'sempre' marking. Staff (b) on the right shows a more complex, aleatory rhythmic section with various markings like 'sempre' and 'sempre'.

Example 5 (a, b). The second component. Facsimile (mm. 17–18; mm. 22–23)

The semantics of this contrasting image is very broad. This is the embodiment of the main idea of the composition and its postulate. It is also a kind of concept that determines the logic of the thought process from the beginning to the end of the Quintet.

The ethical meaning of this image is the need to rise above the routine of the earthly world. It develops in the middle of the Quintet. At the end of the composition, the composer brings us to the brink of transcendence, thus affirming the process of endless and eternal comprehension of the idea of spirituality (Ex. 12).

The third component is an imitation of the sound of the bells. This symbol belongs to the category of eternity and it denotes a connection with the Creator of the universe. In the first part of the Quintet, the bell-like sonorities complement the canon of strings. These are multi-interval chords, which represent a harmoniously linear version of the canon's theme (Ex. 6, piano part). In the last movement, these multi-interval chords are transformed into a polyphonic imitation of chords of fifths and acquire the sonic character of the organ (Ex. 7). In addition, the function of these chords also changes. In the last part, they replace the canon of strings.

The image shows a single staff of handwritten musical notation. It includes various markings such as 'ord.', 'ppp', and 'mult. vibr. lento'. The notation is complex, with many notes and rests.

Example 6. The third component in the first part. Facsimile (mm. 33–36)

Example 7. The third component in the last part. Facsimile (mm. 152–154)

These three components of the first image sound in parallel and their counterpoint development are based on the principle of contrasting complementarities (counterpoint sounds: diatonic of white and black keys; diatonic and twelve-tone chromaticity; rhythmically strict canon of strings and aleatory rhythms in the piano part; imitative polyphonic texture, turning into a micro-chromatic sonoric structure, and polychords of a diatonic scale, etc.). This creates an impression of vast time and space, which can be associated with eternity and infinity.

The second most important image of the Quintet is a more intimate one—it conveys the idea of spiritual beauty and the pursuit of inner balance. This is an ostinato type of monody in the piano part (Ex. 8).

Example 8. The second image of the Quintet (mm. 53–56)

The theme is based on a melodic figuration of the main harmonic complexes (Ex. 4 a, b). This theme—just like the canon theme—is also diatonic. However, the canon's theme is anhemitonic. Here, on the contrary, the elements of the minor second are pronounced. The development of the first image (infinity and eternity) is based on the principle of variation. The second image (of spiritual beauty and the idea of eternal striving for it) is conveyed through the disturbance and restoration of the ostinato movement. The inertia of the ostinato is disturbed by episodes belonging to another system of pitch and rhythmic organization.

The appearance of the image of spiritual beauty is preceded by a shaky fluctuation of the strings, which creates the impression of tense silence and an atmosphere of anticipation (Ex. 8). Further, this fluctuation accompanies the image of spiritual beauty as a counterpoint. For 34 measures, the strings play one chord on a dominant basis (E–F–A–B), played *vibrato*. Muffled dynamics (*ppp*) is disturbed by breakouts of dynamic waves (*crescendo* reaching *forte*). There are also frequent articulation changes. All this produces a sonoric layer

based on one chord, featuring continuous variability and inner mobility. Thus, the episode in which the image of spiritual beauty is expanded (bars 51–86) has a multifaceted characteristic, since the two worlds sound in parallel. One of them is the explosive sonoristic layer of the strings that transmits internal tension. The other is the monotonous *ostinato* monody of the piano as if it was a state of detachment from the mundane.

The middle part of the Quintet (bars 97–137) creates a contrast to the first and third movements, as is customary in classical forms. It opens up another world to us—the world of human existence, the inner world of a man—but continues to develop the main idea of the composition. This is a statement of the need to rise spiritually above the routine of the mundane world. The connection with the first part of the Quintet is maintained through the use of reminiscences, as well as in the reliance of the thematic material on the main constructive intervals (that is, on the major second and fifth). The harmonic system of the middle part is also based on the twelve-tones (with reference pitches A–E and A_b–E_b), but unlike the first movement, here the composer relies on the chromatic scale.

The three contrasting episodes (a, b, c), which are united by the “breakthrough” theme, form the drama of this part. The first (a) and the last episode (c) seem to convey the state of a person involved in the flow of life. There are ups, downs, inertial flow, hopelessness, and attempts to break away from the vicious circle. The first episode (a) is a multiline polyrhythmic layer of strings with a wavy configuration. The lines of this layer are based on general forms of movement, in the figuration of which irregular rhythmic groupings are used (triplets, quintuplets, etc.). Scherzo elegance, accentuated by such playing techniques as *spiccato*, *staccato*, *pizzicato*, is combined with heavy traffic rushing to the top of the wave. The simultaneous flow of the oppositely directed scale-like passages and the change in types of movement and articulation intensify the tension of this episode. The meteoric rise is replaced by a slower ebb, ending in an expression of sorrow and resignation—a chord sequence that functionally belongs to the key of A_b minor (Ex. 9, bars 115–116).



Example 9. The middle part. End of episode “a”. Facsimile

Episode “b” is the antithesis of the surrounding sections. Its purpose is to show the soaring of the spirit over the vanity of the world. The solo violin becomes the carrier of the philosophical idea. In a multi-layered texture, the first violin rises above everyone. Its ascetic melodic material (major second and fifth) is combined with flexible plasticity (Ex. 10).

Example 10. Episode “b” from the middle part. Facsimile (mm. 118–120)

Unequal lengths of phrases separated by pauses, varied rhythmic pattern, change of tempo, the wide amplitude of ups and downs, timbral and register contrasts—this is like living speech, like an emotionally rich monologue. Sadness and pain, moments of reflection and despair are intertwined in it. There is also a frozen soaring of dreams, ending with a return (fall) to reality.

The multi-layered space of episode “b” is semantically symbolic (Ex. 10). Everything is thought out here. On one pole, there is a floating violin and a fifth F#–C# sharp (viola and second violin) that subtly reacts to the variability of its mood. This is a sliding background that gradually turns into a microtonal band. At the opposite pole in the piano part is the already familiar aleatoric fragment, which is associated with the spheres of the mundane and the sacred. In the center of this multi-layered score is pitch A (in the cello part). It is introduced very effectively and performs the organizing function of the central tone in the polytonal space. For 18 bars, the author presents this pitch in a constant change of articulation and performance techniques. We hear a sharp *sfz* and a *vibrato diminuendo* (Ex. 9), then a quiet flutter of the pitch produced by the harmonic, then an alternation of a soft cold timbre (*sul tasto*) and a rougher timbre (*sul pont.*). In addition, pitch A is a connection at a distance with the beginning of the Quintet, i.e. with the first pitch of the canon. This connection is confirmed by the further appearance of the main motif of the canon. Now, in a multi-layered space, the motif is performed using the harmonics and is perceived as a remote, almost unreal, echo of the past.

The attempts of the human spirit to rise above the mortal world, the dreams of eternity, both are illusions that collapse in the end. This subtext embodies the last section of the middle part of the Quintet (bars 132–151). Several points are to be noted here. Firstly, it is the steadily decreasing plasticity of movement. Sliding down the descending semitones of non-metric sequential figurations evokes feelings of doom. Secondly, the timbral-instrumental solution of the concept. The composer temporarily removes the strings, instructing the piano to create a chilly, detached atmosphere (by the way, this is the only piano solo in the Quintet). Thirdly, the efforts to counter the passive inertia of a crash are noteworthy. This is felt in the textural and rhythmic design of the material (opposite direction of the lines, polyrhythms, mismatch of rhythmic and metric accents, rhythmic augmentation, etc., all at the same time). The elegiac character of improvisation (aleatory rhythms at the *rubato* tempo) holds back the dynamics of the fall for a short time. The renewed flow of descent ends with the passage of confrontation (bar 136). However, all efforts are in vain. We hear (as if from afar) a severely ascetic chorale of strings, which confirms the tragic meaning of the entire middle section.

The culmination of the whole development is the last part of the composition. The main changes are taking place in the field of textured presentation of musical material. Firstly, both main images sound in parallel. Secondly, the four-voice canon is transformed into a polyphony of four layers. Therefore, the canon theme covers (fills) the entire range of the Quintet’s sound: from low chords in the piano part to high harmonics in the violins part (Ex. 11).

Example 11. The last part. Facsimile

This presentation resembles the architecture of sacred buildings and their vertical construction. Its foundation is in deep antiquity, and the towers rise upward reaching the sky (violin flageolets). This association is also reinforced by the thematic material itself, which is associated with Christian culture (these are canon, chorale, imitation of the sound of bells and organ). In addition, the second image sounds here without disturbing the ostinato movement until the very end. This is associated with litany, with prayer. In other words, in the last part, the composer builds a cathedral—a symbol of faith and spiritual community, which was lost in Soviet times.

The transcendental end of the Quintet (Ex. 12) contains the philosophical and Christian conclusion that the pursuit of spiritual beauty and its attainment is an endless process and that beauty is hidden in Divinity—in the substance of eternal aspiration.

Example 12. Code. Facsimile

Conclusions

The Quintet (Op. 60) is devoted to the embodiment of the idea of an eternal striving for spiritual beauty, which is quite difficult for a chamber composition. Barkauskas develops this idea in the interweaving of moral, ethical, philosophical, and Christian worldview positions. The main conceptual components of the Quintet are the demonstration of the eternity and infinity of the universe, the awareness of beauty and belief in the power of the human spirit, the regret about the perishable nature of life, the assertion of the need for spiritual freedom and rising above the mundane of the earthly world. The Quintet is structured in a complex three-part form, in which the dramatic development is carried out as follows. The first part is the exposition and development of two main images: the image of eternity and infinity as well as the image of spiritual beauty. The second part is devoted to the inner state of the personality in its connection with the outside world. Note that there is a certain amount of subjective perception of the world—this is a feeling of loneliness and the collapse of illusions as well as volitional efforts to overcome the feeling of helplessness. The third part is like a solemn ascent to the temple of God to be cleansed in prayer and be in connection with Truth, with Love, i.e. with the Almighty. This is the culmination and the aim to which the entire development of the Quintet leads. The coda is perceived ambiguously. It might be conveying the idea of the infinity of the process of spiritual perfection as well as the path to eternity.

Although Barkauskas relies on the classical form, nevertheless it acquires individual characteristics, which are due to the author's concept, means of expression and specific mastery of space and time. Firstly, it is a multi-layered composition in which semantically multi-component images are developed in parallel. This led to the volume, ambiguity of sound matter, a saturated and intense processuality and reduction in the temporal parameter of sound (the performance of the Quintet lasts 17 minutes). Secondly, the form is not closed, which is in accordance with the idea and concept of the composition. Thirdly, there are no clear boundaries (rhythm tectonics, cadence) between the main parts of the form—the end of one section, as if it is linked with

its further development, becomes the beginning of the next section. This is due to the polyphonic nature of the texture and the peculiarities of the drama.

The analysis of the musical text showed that Barkauskas uses different pitch systems, both tone (seven-step modal and tonal diatonic; twelve-tone structures formed on the basis of the chromatic scale or as a result of the chromatic ratio of diatonic scales), and microtone (tempered and non-tempered). We also note the use of different techniques (limited aleatory, ostinato, techniques of polyphony, and techniques of sonorous sound complexes) and the use of different principles of organizing the space-time continuum. We can say that Barkauskas uses all types of sound organization known to him, excluding dodecaphony and serial technique. All these different systems replace each other diachronically and sound synchronously in the counterpoint of the layers. The listener gets the feeling of a wide historical-temporal space, which can be associated with infinity. The composer pays great attention to the articulation and techniques of performance, as well as the use of features of timbre and register for expressiveness and color. This was also noted in the review, speaking of “... unexpectedly colorful tints of light and shadow ... and the variety of *vibrato* techniques” (Maslovskaya 1983: 34).

Therefore, despite a wide variety of means of expression, techniques, and sound systems, the Quintet has a logical direction of thought from the beginning to the very end. The development process starts from the lowest string notes and ends with piano's *al niente* in high register. This movement is determined by the idea of striving towards the sublime. In addition, reliance on tonal functional connections, especially tonic-dominant ones, also contributes to the purposeful movement of thought. They are found in relation to the sections of the composition, and to the layers of texture. They especially activate the course of composition, which is meditative in nature. The whole course of the work is regulated by two main centers—A (with its dominant) and A_b. The theme of the Canon, its initial motif of the major second and the interval of the fifth form the melodic and harmonic structure of the Quintet (its horizontal and vertical dimensions). It also contributes to the unity of the entire composition.

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Vytauto Barkausko Kvintetas teleologiniu aspektu

Santrauka

Kvintetas dviem smuikams, altui, violončelei ir fortepijonui (op. 60, 1980) – tai retas Vytauto Barkausko kūryboje meditatyvinės nuotaikos kūrinys, kurio idėją pats kompozitorius įvardijo kaip „amžino grožio siekimą“. Ši idėja glūdi etinių, moralinių, filosofinių ir krikščioniškų nuostatų sampnyje. Jos įgyvendinimas tampa kūrinio tikslu, kuriam naudojamos visos kompozicinės dramaturginės ir išraiškos priemonės. Kadai apie tai recenzijoje užsiminė ir Osvaldas Balakauskas (Balakauskas 1981: 13). Kvinteto analizė, nukreipta į muzikinio kontinuumo erdvės ir laiko parametrų ryšius su semantiniais aspektais, traktuojama teleologiškai. Būtent – suvokti kūrinio koncepciją, atskleisti muzikinio teksto organizavimo ir vyksmo logiką, išaiškinti išraiškos priemonių pasirinkimą.

Visatos begalybės ir grožio suvokimas, *sacrum* ir *profanum* santykis, dvasinės bendrystės ir kilstelėjimo virš kasdienybės būtinumas, tikėjimas žmogaus dvasios stiprybe – tai Kvinteto koncepcijos postulatai. Jie įkūnyti sudėtinėje trijų dalių dramaturginio vyksmo formoje. I dalis – pagrindinių vaizdinių (t. y. amžinybės ir begalybės bei dvasinio grožio) ekspozicija ir plėtra. Šie vaizdiniai yra daugiakomponentiniai, priklauso skirtingoms garsinėms sistemoms ir įvairiai plėtojami daugiaplanėje kompozicijoje. Jų tarpusavio santykis pagrįstas kontrastinio papildymo principu. II dalis atveria vidinį žmogaus pasaulį, jo santykį su aplinka. Čia rasime ir subjektyvios pasaulėjautos dalelę. III dalis – kulminacija – lyg iškilmingas pakilimas į šventovę, kai maldoje galima susijungti su aukščiausiąja tiesa, su meile. Transcendentinė Kvinteto pabaiga (koda) teigia, kad grožis slypi Dieviškume – amžino siekio substancijoje.

Nors Barkauskas remiasi tradicine forma, tačiau ji turi savitus bruožus, nulemtus individualaus sumanymo bei specifinių erdvės ir laiko pojūčių. Pirma, Kvinteto kompozicija daugiaplanė, čia vaizdiniai skamba paraleliai. Taip suteikiama minties ir veiksmo koncentracija, audinys pasižymi daugiaprasmiškumu, erdvinio talpumu, intensyvumu. Antra, forma lieka atvira – *al niente* pabaiga nukreipia tarsi į begalybę. Trečia, nėra ryškių prasminių ir tektoninių ribų tarp pagrindinių formos dalių. Ši dramaturginį sprendimą lengvai įgyvendina polifoninė faktūra.

Išraiškos priemonių analizė atskleidė, kad Barkauskas naudoja įvairiomis garsinėmis sistemomis: tonine (modalinio ir tonalinio atspalvio septynių garsų diatonika; dvylikagarsė sistema, kuri viena atvejais grįžta chromatinio garsaeiliu, kitais atvejais susidaro dėl politonalumo) ir mikrotonine (temperuota ir netemperuota). Kūrinys dar pasižymi kompozicinių technikų

(t. y. kontrapunkto, ostinatinė, ribotos aleatorikos, sonorinių kompleksų) ir faktūros organizavimo įvairovė. Siekdamas tembrinio spalvingumo ir išraiškingumo, autorius daugiau dėmesio skyrė artikuliacijai, techniniams atlikimo būdams bei instrumentų registrų savybėms. Visos įvairios sistemos ir technikos, besikeisdamos diachroniškai, formuoja kontrapunktinių sluoksnių sinchroninį skambesį. Tai leidžia pasijusti tarsi erdvėlaikyje, kuris gali asocijuotis su amžinybe ir begalybe.

Nepaisant išraiškos, techninių priemonių, garsinių sistemų įvairovės, Kvintetui būdinga logiškai kryptinga minties eiga ir vientisumas. Bendras judėjimo vektorius – nuo žemų styginių iki tolstančio fortepijono solo – atspindi dvasinio grožio siekio idėją. Šios mediatyvinės kompozicijos vyksmas aktyvinamas remiantis tonaliniais funkciniais santykiais, ypač tonikos–dominantės. Kvinteto vientisumą užtikrina tiek išorinės (reprizos, reminiscencijos, ištisinis pagrindinio vaizdinio plėtojimas, „proveržio“ temos pasikartojimas), tiek giluminės priemonės (horizontalę ir vertikalę formuoja du konstruktyvūs intervalai, t. y. didžioji sekunda ir kvinta, o visą eigą reguliuoja ir jungia du pagrindiniai centrai – *A* ir *As* garsai ir jų dominantės).

Kvinteto premjera įvyko Druskininkuose 1980 m. spalio 1 d., atliko Vilniaus kvartetas ir kompozitorius (fortepijono partija).

Teleological Transformations of Timbral Texture in the Orchestral Music of the 20th Century

Abstract. In this paper, we examine teleological transformations of timbral texture, which occur when tonal priority rivals, or is being at least partly replaced, by the timbral one. We examine this phenomenon through analyses of compositions by Stravinsky, Honegger, Bartók, and Britten. The main finding of this paper is that teleological transformations are inseparable from the process of dynamization of the archetypes of timbral texture (antiphonal, responsorial, heterophonic and bourdon, see Janeliauskas 2019).

Keywords: teleological transformation, dynamization of timbral texture, antiphonal differentiation, responsorial exchange, heterophonic timbral alterations, bourdon, register peculiarities.

Introduction

Teleological topicality of timbral texture emerges when the potencies of centralization of tonal major/minor system begin to fade in favor of modern compositional techniques, such as symmetric modes, dodecaphony, sonorism, aleatory, etc. These and other similar compositional techniques are inseparable from the actualization of the timbral aspect of musical texture. For instance, the inertia of successive pitches could be broken down by unexpected changes of timbre or register, employing pedal drones, polytonal combinations, sonoristic techniques, etc.

As the traction to the tonal center fades, a teleological imbalance of composition, which activates dynamization of other musical parameters (especially timbre and rhythm¹), emerges. During this conjunction, timbral texture often undergoes teleological transformations. The process, which began in the framework of major-minor, essentially transforms due to the timbral elaboration of its components. This is especially evident in the orchestral music of the late 19th and early 20th centuries. Here, the timbre shifts from a role of a supporting element that helps interpret tonal relationships, to a leading agent of composition's teleology. This emergent dominant role is named a teleological transformation of timbral texture². Therefore, highlighting the teleological transformation of the timbre would be the primary goal of this work.

The hypothesis of this work is centered on the dynamization processes of the archetypes of timbral texture (Janeliauskas 2019), which, in our belief, helped to establish a new way of audiation that transformed the composer's relation with the sound itself (from pitch-centered to timbre-centered)³. It seems that this transformational teleological shift happens in the circumstance of Neotonicity. One could hypothesize that the more evident the tonal decentralization is, the more active the dynamization and autonomization of timbral texture are.

The term "decentralization" here is used to describe the situation of tonality after the common-practice period. Various theoretical research covers many different types and traits of Neotonicity, which essentially indicates different levels and states of decentralization⁴. Musicological observations on Neotonicity (decentralization) are highly relevant to this research, as they provide a great source of symptoms of possible independent teleological designs.

Our research revolves around orchestral compositions by Stravinsky, Honegger, Bartók, and Britten, which (as we will see) serve as excellent examples of the dynamization of the archetypes of timbral texture (antiphonal, responsorial, heterophonic and bourdon). We thoroughly discussed the notion of timbral texture and manifestations of its archetypes in our previous publication (Janeliauskas 2019); therefore, this paper is a direct continuation of the aforementioned work⁵.

¹ Actualization of rhythmic processes is discussed (Janeliauskas 2017).

² The notion of timbral texture here is equated to a principle of composing (Janeliauskas 2019).

³ More on the composer's relationship with sound (aka compositional relation) (Janeliauskas 2018).

⁴ The author's views regarding the problems of tonality (including neotonicity) are thoroughly discussed (Janeliauskas 2002).

⁵ This article was originally intended to be an integral part of my previously published paper *National Traits of Timbral Texture in the Symphonism of "Dramatic Frescoes" by Eduardas Balsys. The Quaternion of the Archetypes of Timbral Texture* (Janeliauskas 2019). However, due to editorial peculiarities, as we strive to perfect the terminology, a few linguistic changes were made. As a result, the names of the archetypes were slightly altered: *antiphonic* archetype, discussed in the previous publication, is now called *antiphonal*, as well as *responsoric* is now referred to as *responsorial*. As this text was written as a part of the same research, I think it would be wise for these two publications to share the same list of references, even though some authors may not be directly mentioned in this paper.

Since teleological aspects of timbral texture are the central object of this research, which is not a standard musicological topic, we will employ versatile methodological means, such as logic analysis, comparative analysis, identification, systematization, and typologization.

Teleological dynamization of timbral texture archetypes

Archetypes came into existence in closed societal environments and thus tend to carry the potencies of eternal repetitiveness, uniformity, tradition, and permanence. The new constituents of 20th-century music, on the other hand, bring the opposite kind of values; the orchestral (timbral) texture is often transformed by employing the means of dynamics, namely by increasing, decreasing, or sustaining the intensity and/or density of musical material. The “genome” of each archetype affects this novel teleological flow differently. Therefore, we will discuss the most noteworthy iterations of these archetypic manifestations.

Dynamization of the antiphonal archetype

We can tier the means of antiphonal timbral dynamization systematically, starting from the simplest and moving towards more advanced forms of it. The simplest methods of organizing the teleology of timbral texture are:

1. Timbral groups that are “trading blows” in an antiphonal manner are being summed into a tutti.
2. An antiphonal response of a timbral texture is being applied to a phrase of continuous development, instead of a repeated one.
3. Antiphonal timbral alternation is interspersed with a group of contrasting timbre.

The more advanced and complex methods are:

4. Multiplexing the antiphonal alternations by employing an element that is later expanded and becomes a catalyst for reaching the climax.
5. An already multiplexed antiphonal alternation enriched with a bourdon of a separate timbre and group.

The most complex cases are the matchings of two different antiphonal systems, such as:

6. Juxtapositions of massive orchestral antiphons and chamber or solo antiphons, etc.

Here we would like to present *Jeux des cités rivales* from Stravinsky’s *Le Sacre du printemps* as a perfect example of antiphonal archetype manifestations. There are two cornerstone antiphonal oppositions in this composition—two types of timbral textures:

- A. Massive orchestral texture,
- B. Transparent chamber texture.

The former is based on alternations between tutti and different orchestral groups (Fig. 1, 1a). The latter, on the other hand, operates on alternations between different “ensembles”, which could be called “timbral canons” (Fig. 2). What is more, orchestral (A) and chamber (B) timbral textures swap places.

In the process of articulating the formal aspect of the composition, the significance of the third timbral texture (C) shows through. It is a rhythmic *ostinato*, which, inter alia, plays a big role in creating the ritual/magical qualities of the composition (Fig. 3). This composition has a twofold implementation of this *ostinato* element. In the phase of exposition, it functions as an element interrupting the alternation of antiphonal texture A. A pair of timpani together with the low brass start at the beginning and then make two interruptions during changes between the orchestral groups (Reh. marks 57–59). During the phase of development, this *ostinato* element gains the attributes of a continuous bourdon (low strings and woodwinds) and therefore stabilizes a dense (multiplexed) alternation of orchestral antiphons (Reh. marks 62–63).

It is worth noting that at the end of both sections of interactions between antiphon A and element C the “chamber” antiphon B makes its appearance. The first appearance of antiphon B happens at the end of the expositional phase, with an additional interruption of the tutti by antiphon A (Reh. marks 60–61). The second appearance happens at the end of the development phase (Reh. mark 64).

Summing up the means that were used to articulate the timbral texture in an antiphonal manner within the composition, we observe that each phase has its distinct characteristics:

1. In the expositional phase, the antiphonal processes tend to be discrete.
2. In the development phase, the antiphonal processes are more continuous.

Figure 1

Figure 1a

Figure 2

Figure 3

Jeux des cités rivales from Stravinsky's *Le Sacre du printemps*

The discrete nature of this type of teleology becomes evident when observing these key moments:

1. Antiphons A and B become acoustically separate thanks to their interruptions into each other's flow (Reh. mark 60).
2. Element C articulates the alternation periods of antiphon A in the manner of a falling progression (2 alternations–1 alternation).
3. Interruption of antiphon A by a “timbral canon” separates its periods and prevents them from being summed up (Reh. marks 57–60). On the other hand, the interruption of antiphon B by tutti separates its “canon” from its expansion (Reh. marks 60–61).

In turn, teleological continuity relies on these aspects:

1. There are no interruptions between antiphons A (Reh. marks 62–63) and B (Reh. marks 64–65) and each of them reaches their climactic points. This allows developing a certain degree of similarity between orchestral (A) and chamber (B) qualities of these antiphons.
2. Element C is being recomposed into a continuous flow, which acts as a unifying bourdon.

Dynamization of responsorial archetype

Responsorial archetype introduces several systematic tools to the articulations of timbral texture:

- 1) dissolution of orchestral tutti into separate timbral groups;
- 2) assembling *solo* timbres into a fused timbre;
- 3) simultaneously layering *solo* and fused timbres;
- 4) interchangeability of timbral layers (*solo* and fused);
- 5) dynamic articulations of separate layers using antiphonal alternation (fused timbres) and hoquetus (*solli*).

We chose the first part of Honneger's Symphony No. 5 to illustrate these tools. We believe that this composition mirrors the techniques of the organum of the Gothic period (parallel voice leading, use of horizontal melismas, hoquetus, bourdon counterpoint, etc.).

The responsorial approach to the teleology of timbral textures focuses on the timbral polarity between expository and development phases. The expository phase of this composition can be characterized by successive alternations between *solo* and fused timbres (Fig. 4, 5), in contrast to the phase of development, which features simultaneous manifestations (Fig. 6, 7).

The composition begins with the tutti of fused timbre. Triads in the parallel movement are the main feature of this texture. It is set up in two layers—high and low—that are moving in separate directions; this creates a timbral pseudo-counterpoint (Fig. 4).

The synchronous fused timbre tutti is rapidly reduced into separate orchestral groups. At first, the brass section is omitted, followed by a solo episode of the brass section and ending with a pronounced episode of strings (Reh. mark 2). It is noteworthy, that all these “reduced” episodes also feature elements of the aforementioned timbral counterpoint.

Presentation of pure or solo timbres features a variety of formations that perform specific functions (Fig. 5). Here we are going to discuss these functions that help the individualization of timbres, making them recognizable and memorable.

1. A theme played by the bass clarinet helps to establish its timbral character (Fig. 5). We find a similar situation later (Reh. mark 4), only featuring an English horn.
2. The function of bourdon counterpoint is very favorable for individualizing the timbre of horns, which is later being transformed into strings (Reh. mark 3–4).
3. Hoquet of gestural motives emphasizes the timbral alterations between bassoons and cellos (Fig. 5).
4. Heterophonically doubling horizontal elements with different timbres also helps individualize the timbres, e.g. Trombone III *con sord.* together with double bass *pizz.* (Fig. 5), and the first clarinet with bass clarinet shortly after.

In the next episode (Reh. marks 5–8) individualization of different timbres is further intensified and expanded upon. This is achieved by:

5. Ostinato (Double bass and tuba, later substituted by cello *pizz.*) and quaver figurations (Reh. marks 5–7).
6. Triadic fanfares of a distinct “dotted” rhythm (horns and trombones afterward) (Reh. marks 6–7).
7. Development of theme's motifs by adding more and more timbres (from timbral alternations between Clarinet I and English horn, all the way to full heterophony between woodwinds and strings) (Reh. mark 7).



Figure 4



Figure 5



Figure 6



Figure 7

Examples from the first part of Honneger's Symphony No. 5

Thanks to these and similarly functioning timbral textures (the means of timbral individualization), the perception of pure (solo) timbre reaches a certain critical level and starts to be perceived as a mixture of different timbres. At some point, due to the constantly expanding field of solo timbres, the timbral texture mutates into a fused timbre tutti (Reh. mark 7–8).

In contrast to the first variable expositional timbral texture, where we saw a disassembling of tutti and an expansion of the function of *sol*i, the opposing development phase features a simultaneous coexistence of solo and fused timbres (Reh. marks 9–11). However, it does not seem like it is a classical sonata-type development, but rather a transformed responsorial texture that has its origins in Gregorian responsory.

The last episode (one may call it a “co-existential”) is based on repetitions of simultaneous layers of fused and solo timbres. At the beginning of the episode, the four-bar phrases of the string block are being repeated. A block of horns is added at the end of this segment. At the same time, the layer of woodwinds adds gestural motifs in a fashion of hoquet (Fig. 6). After the fourth cycle of repetitions, a swap occurs between the layers of timbral texture. Now the phrases are relocated to the layer of woodwinds with a similar addition of brass (Fig. 7). The composition ends in an extensive *codetta*, which helps position initial *tutti-sol*i elements of timbral texture (Reh. mark 12–13).

Dynamization of heterophonic archetype

The teleology of the heterophonic archetype is based on the timbral alterations of diaphony. Here we will discuss a few most prominent cases:

1. The nature and variability of diaphony is determined by the timbral peculiarities of the pair.
2. Cycles of timbral alterations maintain a close relationship with the variability of diaphonic repetitions.
3. Differences between the timbral pairs, as well as their extent and progressions, are determined by teleological motives of the timbral texture.
4. Cycle of timbral alteration, based on a parallel diaphony, can be dynamized with a polar counterpoint.
5. Complementary heterophonic texture might be used as an accompanying unit to the timbral diaphony.

We will illustrate these processes of heterophonic teleology with the examples from the “Game of Pairs”, the second movement of Bartók’s Concerto for Orchestra. The title of this composition, in our belief, should be interpreted as a signifier of heterophonic processes, which materialize as timbral alterations of parallel diaphony. These alterations are set up in deliberately chosen instrumental pairs (2 Bsn., 2 Ob., 2 Cl., 2 Fl., 2 Trp.). Timbral alterations, in this case, do not produce exact repetitions. The profile of changes depends on the technical and acoustic peculiarities of a particular instrumental (timbral) pair. These peculiarities determine the intervallic structure, register, rhythmic and melodic patterns of the diaphony. The intervals of diaphony vary depending on innate features of the “hidden harmony” of a particular timbral pair. For instance, the pair of bassoons show their optimal resonance in a diaphony of sixths, oboes sound their best when set up in thirds, clarinets—in sevenths, flutes—in fifths, and trumpets—in seconds. “Playful” subtleties of heterophony are unfolded by modifying these pair-specific intervals. For instance, putting major sixths or thirds alongside their minor counterparts, or setting an imperfect consonance (the third) alongside the perfect one (the fifth). Wide intervals are heterophonically strengthened by the narrow ones (for instance sevenths and seconds), while vertical intervals are being contrasted with melodic ones (for instance vertical structures based on seconds are being contrasted with melodic leaps).

Timbral and intervallic differences of pairs also correspond with the melodic-rhythmic profile of the diaphony. For instance, technical possibilities allow flutes to create a varying contour of diaphony, expanding its range to a maximum with *virtuoso* passages, trills, *frullato* elements, etc. In the meantime, the pair of trumpets play a very conservative (in a sense of virtuosity and tempo) melodic line. We would like to think that these attributes are primarily determined by the rich timbral quality and acoustic traits of trumpets that favor slower musical motion.

Qualitative variabilities of diaphony, which are determined by timbre, form successive patterns. Each new pair creates a contrast with the previous one—and therefore—characterizes and differentiates itself. The model of ever-increasing differentiation of timbral pairs reminds us of a constantly accelerating swinging object.

123
(lo stesso tempo)
senza sord.

Trp. I, II
in C
Trb. I, II
Tuba
S. Dr.

always without snares

Figure 8

189

I Obs.
II Obs.
I Cita. in A
II Cita. in A
Vln. I
Vln. II
Vla.
Vcl.
D. Bs.

sempre sfacc.
sempre sfacc.
sempre sfacc.
sempre sfacc.

Figure 9

a te:

I Flta.
II Flta.
Obs. I, II
Cita. I, II
in A
Bsns. I, II
Vln. I
Vln. II
Vla.
Vcl.
D. Bs.

pizz.
pizz.
sul pont.
pizz.
ord.
ord.

Figure 10

241

I Obs.
II Obs.
I Cita. in A
II Cita. in A
Harp I
Harp II
Vln. I
(div. in 3)
Vln. II
(div. in 3)
Vla.
Vcl.
D. Bs.

Cl. A1, B1
Cl. D1, Eb, F1

Figure 11

Examples from the *Game of Pairs*, the second movement of Bartók's *Concerto for Orchestra*

Therefore, we would like to call this teleological pattern a “swinging dynamic”. The layer of strings in “Game of Pairs”, in our belief, also follows this rule: It heterophonically reciprocates other timbres in an improvisatory manner, based on a model of “hoquet-bourdon” (reminding us of a Gamelan orchestra) and heavily depends on the changes of diaphony. Here Bartók employs a diverse arsenal of string techniques (*pizz.*, *gliss.*, *sul pont.*, *con sord.*, etc.). This enables assigning different timbral qualities of strings to different timbral pairs. For instance, in the episode of bassoons, the strings reciprocate with *pizzicati*, which transforms into a canonic hoquet in the section of oboes. Reciprocation of clarinets is implemented using octave doublings, where high strings play continuous trills and low strings perform rhythmic *staccato* (except the syncopated rhythm of double basses, which helps maintain the pulse of the hoquet). Heterophonically divided strings that employ every available timbral variation, reciprocate flutes, while dissonant diaphony of trumpets is accompanied by a tremulous layer of whole tone scale.

The improvisatory nature of this “hoquet-bourdon” is further enriched by spontaneous and very memorable bursts of melodic figuration:

- 1) addition of a tritone to the pair of oboes (bars 28–30);
- 2) unisonic reciprocation supported by a bourdon (bars 41–44, 83–86);
- 3) interposing parallels of fifths (bars 67–69);
- 4) a “preface” to the pair of trumpets (bars 87–89);
- 5) an “invasion” of chords (bars 105–108), etc.

These and similar reciprocations help establish the timbre of strings as heterophonically equal to the timbre of a dominant pair.

Looking at the bigger picture (the form of the composition), we can notice that the heterophonic field of timbral texture is being projected concentrically. For instance, at the collision of the cycle of timbral alterations and its repetition, an episode of timbral opposition is introduced (bars 123–164). It is a dual-unit episode, consisting of harmonic-choral (brass) and sonoric-rhythmic (Snare Drum) elements (Fig. 8). This dual-unit episode can be interpreted as a hidden “reconstruction” of the previous timbral layers (woodwinds, strings). Furthermore, it seems that fragmental positioning of pitchless timbre in the starting and finishing moments of composition (rhythmic elements of Snare Drum) is realizing the archetypal symbolism of a concentric circle. This symbolism is very characteristic of heterophonic timbral texture. It is noteworthy that here, in contrast with the “hoquet-bourdon”, no canonic techniques are being used.

A dual-unit timbral formation becomes an axis of a circle. The establishment of an oppositional timbral axis teleologically motivates a recapitulation of a dual-layered timbral texture. It manifests as a heterophonic variation of the exposition phase with an increased number of timbral voices. Here a counterpoint between timbres of diaphony and characteristic elements of instrumental pairs is formed, while the layer of strings continues heterophonic variations of “hoquet-bourdon” (Fig. 9, 10, 11).

Dynamization of bourdon archetype

Systematic manifestations of the bourdon archetype are primarily related to the processes of dynamization of timbral texture. Therefore, it can manifest in the following ways:

1. Timbral alterations of bourdon dominant and/or dominant area.
2. Introduction or withdrawal of alternative bourdon dominant using a spectral passage (pitch sequence or *glissando*).
3. Emendation of the spectral base of bourdon’s texture by adding or removing resonant timbres of the low register.
4. Amplification of dissonance of the high part of the spectrum by adding a continuous ostinatic figuration of persistent timbre.

Many of these principles are reflected in “Sunday morning”—the second of Britten’s “Four sea interludes”. The systematic nature of bourdon portrays itself through continuous interactions between bourdon dominant and dominant areas. Bourdon dominant here is realized by two textural iterations—the vertical and horizontal textures of brass and string instruments respectively.

An opening iteration imitates the clangor of bells on Sunday morning. It does so by vertical clashes of thirds (much like the clashes of thirds in a diaphony of seconds). One can argue that this texture aims to direct the listener to “the divine”. This assumption is further reaffirmed by the articulation of the clashes—three phrases, four clashes of thirds each. The last interval is stretched along three bars. This arguably creates

an allusion to The Holy Trinity. The melody in the string section (a unison between violas and cellos) is an alternative timbral iteration of the bourdon. The pillar points of bourdon's melody (the "halt points") form a chain of three thirds up (A–C#–E–G#) and down (E–C#–A–F#), allegedly symbolizing the trope of "World Tree". The end of this melody (which is itself based on thirds) is summarized by a vertical structure of seventh chords, which moves horizontally in the steps of seconds. Therefore, the two alternate structures of bourdon are united using an interval of third and polarized by an interval of second (vertically for the first time and horizontally for the second time).

Alternative bourdon dominants substitute each other three times. Each substitution brings timbral alterations of thirds. Expositional "clashes" of horns first alter into a mixture of horns and trombones, while later—into trumpets and a mixture of clarinets and oboes (Reh. mark 3, 6). In the meantime, the bourdon dominant of melodic elements, played by violas and cellos, alters into a unison of violins, which later transitions into a canon of previous timbres (Reh. marks 2, 5, 6, bar 14).

In contrast to timbral groups of bourdon dominants, which are very stable, the periphery of texture excels in the variability of timbral material and melodic figurations, which grow into spectral passages (pitch sequences). It is worth mentioning that these passages initiate the exchanges between timbral bourdon dominants. For instance, the falling passage performed by woodwinds and violins leads to a bourdon of string instruments (Fig. 12), while the ascending passage of woodwinds, strings and harp—leads to a bourdon of brass instruments (Fig. 13).

Another aspect that draws our attention is timbral alterations in the peripheral area of the texture. For instance, during the aforementioned clashes of horns, the woodwinds perform a theme, which (due to its hoquet-like rhythmic pulse) reminds us of heterophony. It shifts to the timbre of strings shortly after (Reh. mark 1). Amid this timbral exchange, we find an ascending pitch sequence. Synchronous timbral alteration of horizontal and vertical dimensions is achieved here by repeating the "clashes of thirds" (Fig. 13, Reh. mark 3)

Figure 12

Figure 13

Sunday morning, the second of Britten's Four sea interludes

(a hoquet-like theme shifts to the timbre of trumpets and strings, while vertical structures transform into woodwinds). Here we discover two alternative means of timbral teleology that are employed: densifying the motifs of the peripheral area while keeping a stable timbral line-up, or densifying the timbral line-up while keeping a relatively stable proportion of motifs (Reh. marks 1, 2). Therefore, at first, we can see short heterophonic motifs of the woodwind section being densified, while later, a derivative figuration of “hoquet-like” theme is being realized by gathering the timbres of flute, piccolo and clarinet in A on top of a string bourdon (one can make a parallel with an image of “birds of the sky” (Matthew 6: 26–30)).

There are a few more noteworthy elements of timbral texture in this composition:

- Timbral alterations of double bass *pizzicato* bear an uncanny resemblance to the hoquet-like theme (double bass *pizzicato* heterophonically colored by harp, timpani and bassoon).
- The anchoring factor of timbral bourdon dominant is the enhancement of the spectral base of bourdon’s texture by stimulating resonant timbres of the low register (tuba, trombones, bassoons and double bass, (Reh. mark 3, bar 9). By adding and later removing a timbral resonance, the composer manages to expose the tonal cycle of sections of composition (D–B_♭–D).
- A certain counterbalance to the resonance of low timbres can be observed in the coda (Reh. mark 6). Here an ostinato figuration of the melodic interval of second and its timbral alterations (clarinet in A and clarinet in E_♭) are introduced, which helps emphasize the high part of the spectrum of the timbral texture and its dissonant nature (pitches D_♯ and E form a dissonance with the main pitch D).

Conclusions

Our research leads us to the following conclusions:

1. As a consequence of the practice of dynamization of the archetypes of timbral texture, the latter undergoes a teleological transformation. They transform the function of timbre and other secondary musical parameters from the roles of supporting elements that help interpret tonal relationships, to the leading agents of composition’s teleology.
2. The means of dynamization are individualized with each different archetype of timbral texture (antiphonal, responsorial, heterophonic and bourdon).
3. Antiphonal archetype of timbral texture enables a composer to polarize discrete and continuous natures of antiphonal alternation by employing individualized means of dynamization (developing variability of change, compaction, bourdonization, etc.) and thus autonomize the timbral texture
4. Responsorial archetype, being enriched by special means of dynamization (reduction of tutti, extended individualization of *solī*, the coexistence of subordinate layers, etc.) enables the teleological polarization of pure and fused timbral constructions in sense of sequentiality and simultaneousness. The opposition of these two components transforms the teleology of composition from pitch-centered to timbre-centered.
5. Heterophonic archetype of timbral texture enables transformations that are executed by dynamization of diaphony (selecting pairs of uniform timbres, forming their timbral and intervallic patterns, melodic contour, etc.). Timbral intensification of diaphony allows us to build a concentric type of teleology, which is notable for its polarized axis of timbral expression.
6. Particularities of Bourdon timbral texture (layering bourdon dominant in the lower part of the register spectrum, or cultivation of a dissonant textural periphery, exchanges between the edges of the register spectrum) enables the realization of a timbral design, which is notable for its teleologically polarized registers.

We would like to end on a generalizing insight that all of the discussed transformations and designs of timbral texture feature a code of polarity or opposition, such as discreteness/continuity, successive/simultaneous, polar centrum, or polar edges of the spectrum. These polarities point towards an archetypical nature of timbral texture.

We would like to believe that new designs of timbral texture, which we unraveled in this paper, would contribute to the practice of timbre-oriented contemporary music, while the teleological ideas brought out would stimulate the field of music theory.

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Teleologinės tembrinės faktūros transformacijos orkestrinėje XX a. muzikoje

Santrauka

Teleologinė tembrinės faktūros aktualija išryškėja tuomet, kai tonalios mažoro-minoro sistemos centralizavimas ima blėsti dėl įsigalinčių modernių komponavimo technikų: simetrinių modų, dodekafonijos, sonorikos, aleatorikos ir kt. Panašūs komponavimo metodai dažnai yra neatsiejami nuo tembrinio parametro aktyvacijos.

Tyrimo hipotezė orientuota į tembrinės faktūros archetipų dinamizavimo procesus, paskatinusius naują audijavimo būdą, kuris iš esmės transformavo kompozitoriaus santykį su skambesiu: iš tonalaus – į tembrinį.

Dinamizavimo priemonės individualizuojamos kiekvienam skirtingam tembrinės faktūros archetipui – antifoniniam, responsoriniam, heterofoniniam, burdoniniam.

Antifoniniam tembrinės faktūros archetipui pritaikius individualizuotas dinamizavimo priemones (plėtojant kaitos variantiškumą, sutankinimą, burdonizavimą ir pan.), atveriamą galimybę kompozicijos mastu poliarizuoti antifoninės kaitos diskretiškumą su kontinualumu ir šitaip autonomizuoti tembrinę faktūrą. Antifoninis tembrinis projektavimas kompensuoja prarastas decentralizuoto tonalumo galias, kaip antai – kompozicijos visumos sąsają. Antifoninio projektavimo aktualumas iliustruojamas I. Stravinskio kompozicija *Jeux des cités rivales* iš baletu *Le sacre du printemps*.

Responsorinis tembrinės faktūros archetipas, praturtintas išskirtinėmis dinamizavimo priemonėmis (*tutti* redukavimu, *sol*i individualizacijos išplėtimu, subordinuojamų sluoksnių koegzistencija ir pan.), liudija galimybę teleologiškai (kompozicijos mastu) poliarizuoti mišriųjų ir grynųjų tembrų darinius sukcesijos ir simultanikos aspektais. Šių sandų priešprieša transformuoja kompozicijos teleologiją iš tonalios į tembrinę. Responsorinio teleologinio projektavimo išskirtinumą iliustruoja ištraukos iš A. Honeggerio Simfonijos Nr. 5.

Panašiai veikia ir **heterofoninis** tembrinės faktūros archetipas. Sistemškai dinamizuojant diafoniją (kaip antai – vienodų tembrų poras, jų seką, intervalus, tembrus atliepanti melodinį kontūrą ir pan.), jis leidžia projektuoti koncentrinio tipo teleologiją, kuriai būdinga poliarizuotos tembrinės išraiškos ašis su jos kraštais. Heterofoninio teleologinio projektavimo realizacija iliustruojama B. Bartóko Koncerto orkestrui ištraukomis.

Galiausiai **burdoninės** tembrinės faktūros dinamizavimo savitumas (burdoninės dominantės „uždėjimai“ registrinio spektro apačioje, disonuojančios periferijos plėtojimas viršuje, registrinio spektro kraštų vietos kaita ir pan.) leidžia realizuoti burdoninę tembrinės faktūros projektavimą, pasižymintį teleologiškai poliarizuotomis registruotėmis. Tembrinės-spektrinės teleologijos aktualiją atveria B. Britteno kompozicija *Sunday Morning* iš ciklo *Four Sea Interludes from Peter Grimes*.

Tikimės, jog straipsnyje atskleisti tembrinės faktūros projektai pravers šiuolaikinės muzikos praktikai, susijusiai su tembru, sonorika, elektronika, o išryškintos teleologinės idėjos stimuliuos muzikos teoriją.

Microtonal Peculiarities in Lithuanian Folk Songs as the Background for Scale Construction in *Bloomy Ice* for String Orchestra (2020)

Abstract. This article explores a specific study of interval relations in Lithuanian folk melodies, which became a stimulus to integrate the obtained data into the compositional system. The research of archival sound recordings of Lithuanian folk songs and their instrumental versions was carried out to determine interval distances and possible tone deviations compared with natural harmonic series and 12-TET. Therefore, regularly repeated scale degrees corresponding to the particular tones and microtonal overtones of the natural 31-harmonic series were identified. It was noticed that the interval distances in the scale are very close to the interval *ratio* of natural harmonic series (3:2, 4:3, 5:4, 9:8, 11:8, 13:8, 21:16, 25:16, 29:16, 31:16). The results of this research were used to create a new scale construction for the new work *Bloomy Ice* for string orchestra (2020). Thus, a progression of both 12 microtonal harmonics and non-microtonal scales was built, existent in two natural harmonic series. In another work (*I was Killed by a Banana Tree*, 2019) for tenor recorder, a scale of 29 tones in one octave that refers to transformations of microtonal tetrachord that was constructed by determining microtones of specific scale degrees comparatively with the 12-TET tuning system. This article presents the strategies for shaping the microtonal sound structures and their teleological course via music composition.

Keywords: microtones, microtonal overtones, interval relations, Lithuanian folk songs, Vytautas Germanavičius, composition *Bloomy Ice* for string orchestra, compositional system, natural 31-harmonic series.

This article focuses on the research of specific interval relations in Lithuanian folk melodies, which may be applied to the creation of the original compositional system. The area of interval relations in Lithuanian folk music was not considered much important until the 21st century as many Lithuanian and foreign scholars did not give a preference for the analysis of interval distances in the scale. The main source for this research was archival sound recordings from a period between the 1930s to the 1940s, which could presumably preserve the ancient tunings, unequal tone distances, and the manifestation of microtonality in vocal and instrumental tradition, and which could change and redefine the structure of the scale compared to 12-TET¹, and its interval relations.

First attempts to describe microtonality in Lithuanian folk music

Since the 19th century, the studies of Lithuanian folk melodies were implemented in the works of Lithuanian, Prussian, and other scholars, among them Christian Bartsch, Eduard Gisevius, Louis-Albert Bourgault-Ducoudray, Ludwig Rhesa, but most of the transcriptions of Lithuanian tunes were made at the turn of the 20th century. In that period ethnomusicologists and researchers relied on the 12-tone chromatic scale notational system and tunings of the church organs. However, German educationist and music theorist Friedrich August Gotthold, who studied folklore traditions of the Baltic region, noted this about the Lithuanian melodies published in Rhesa's collection in 1825 that:

“Some tones could have been chromatically altered, and the melodies were softened or modified” (Bartsch 2000: 43)².

During the interwar period of the 20th century, the Lithuanian microtonal composer Jeronimas Kačinskas³ in his article “Prague—the city of creative music initiatives” wrote that:

¹ 12-tone equal temperament (12-TET) means that the octave is divided into 12 semitones of equal size in standard pitch tuning of A=440 Hz where each semitone is measured at 100 cents.

² This quotation was taken by Bartsch from the article by Friedrich August Gotthold, “Über die Kanklys und die Volksmelodien der Litthauer”, published in 1847. In: E. A. Hagen (Ed.), *Neue preußische Provinzial-Blätter*, Band IV. Königsberg, pp. 241–256.

³ The composer and conductor Jeronimas Kačinskas (1907–2005) is considered to be one of the most prominent modernists in the interwar period in Lithuania. He spent two years at Prague Conservatory where he took a course in quarter-tone music under Alois Hába from whom he acquired knowledge of the microtonal and athematic style of music. He adopted an individual approach to microtonality, in a number of his works written in the forties, which became the first examples of avant-garde music in Lithuania. In 1933 Kačinskas established classes of microtonal music in Kaunas and Klaipėda, and regularly published microtonal music articles in the magazine *Muzikos barai* (Fields of Music). Kačinskas' *Nonet* was premiered in 1938 at the International Society for Contemporary Music Festival in London alongside premieres of works by Béla Bartók and Olivier Messiaen; however, most of his microtonal works were lost during World War II. After immigrating to the US, in 1967–1986 he taught composition and conducting at Berklee College of Music in Boston. “Alois Hába considered Kačinskas' *Nonet* to be one of the prime examples of modern music composed in the 1930s, and repeatedly showcased the work in concerts representing his school in various European countries” (Stanevičiūtė 2017: 3). Hába wrote some remarks about Kačinskas' piece *Concerto*

“According to some famous musicians of the city of Prague, the orientalism is closer for Lithuanians than the Western European spirit: it is noticeable in the character of rhythm and melody of Lithuanian folk music. If we take a look at our antique instruments (panpipes, little horns, trumpets, etc.), we will find here the intervals smaller than semitones. It could be assumed that since antiquity Lithuanians have not been familiar with the Greek and German major and minor tonalities. Here will be the most likely influence of later centuries” (Kačinskas 1932: 102).

Lithuanian music theorist and ethnomusicologist Jadvyga Čiurlionyte in her article “How to Transcribe Folk Melodies” (Čiurlionytė 1940: 100), and later Genovaitė Četkauskaitė, the first transcribers of Lithuanian folk melodies, saw the need to notate smaller intervals than a semitone in the scales, and recommended to use these symbols: by arrows up and down ($\uparrow\downarrow$) for tones less than a semitone; by the cross (\times) for indeterminate pitches, and by a wavy line for glissando to the first degree in the scale (Četkauskaitė 2007: 7–8).

Next to the scale analyses in the 12-tone chromatic system, refers to the interval peculiarities related to the natural harmonic series – the natural simplicity of frequency ratios between tones. Musicologist Antanas Venckus in his article “Hexatonic Scales in Lithuanian Folk Music” wrote about the importance of the perfect fifth and perfect fourth (3:2, 4:3) for the construction of a scale. According to him, these intervals (or the probe tones) form the framework of the scale in Lithuanian folk music (Venckus 1969: 69, 72, 74).

In the book *On the Road of Sutartinės and Skudučiai* the vocal and instrumental music researcher Stasys Paliulis mentioned the Lithuanian traditional wood-wind instrument *daudytė* which produces the first five overtones⁴ of the natural harmonic series (Paliulis 2002: 188):



Figure 1. Harmonic numbers of natural harmonic series produced by wood-wind instrument *daudytė* (Paliulis 2002: 188).



Figure 2. *Sutartinė* (Paliulis 2002: 188).

Figure No 1 introduces 5 overtones produced by two *daudytė* long and short tuned in G and A respectively. In Figure No 2 the *sutartinė* polyphonic chant is performed in two tunings G and F: from the fundamental G it produces the 4th, 5th, and 6th harmonics of the natural harmonic series and from F—the 5th and the 6th harmonics. In other tunings of the instrument *daudytė*, the number of produced overtones is practically the same, nevertheless, the G, A, and B tunings produce five harmonics of natural harmonic series the 3rd, 4th, 5th, 6th, and the 8th.

In the book *On the Structure of the Chord* (Juzeliūnas 1972) composer Julius Juzeliūnas focused on the melodic features of Lithuanian polyphonic songs *sutartinės*, the tonal hierarchy, probe tones, intervallic structures in a 12 equal-tempered system but the slight changes of the interval pitch and timbre was not an important area to the composer. However, the different distances of the intervals introduce other tastes and colors, and not only to the particular scale but to the particular sound of the interval itself.

for Trumpet and Orchestra that the Lithuanian composer “builds [quartertone] harmonies in a completely distinct way, and his work is characterized by combined rhythms and polyphonic figurations rich in quintuplets and septuplets” (Hába 1931: 3).

⁴ Harmonics may also be called “overtones”, “partials” or “upper partials”. The difference between “harmonic” and “overtone” is that the term “harmonic” includes all of the notes in a series, including the fundamental frequency (e.g., the open string of a guitar). The term “overtone” only includes pitches above the fundamental. In some music contexts, the terms “harmonic”, “overtone” and “partial” are used fairly interchangeably (Microtonal Encyclopedia, *Harmonic*, 2018).

The psychoacoustics and tonal hierarchies in Lithuanian folk scales were recently conducted by Rytis Ambrazevičius who applied acoustic, statistical, cluster, and other scientific methods for analyses of folk songs. He stated that:

“It can be safely concluded that none of the samples resembles twelve-tone equal temperament, i.e., its diatonic subsets including the minor and major versions and other diatonic scales (e.g., so-called Ancient Greek or Gregorian modes)” (Ambrazevičius 2009: 13).

From this wide range of studies, it can be concluded that the analysis of the interval distances in the scale has not been comprehensively studied, and the sounds which were determined as inconsistent to 12-TET have been equalized or emitted as extraneous tones, or later by adding to the tone a particular symbol marking tone deviations from 12-TET which indicated inexact interval distance and the structure of the scale. In the first study “on the phenomena of interval evolution and unfolding scales” (Ambrazevičius, Budrys, & Višnevskaja 2015: 172–191), misleading conceptions of “Ancient Greek”, and validations of the assumptions of equidistant scales in the Lithuanian traditional music were conducted by Ambrazevičius. However, it was not primarily focused on the approach to micro-interval relations, interval distances, or tuning systems in Lithuanian folk music songs.

The musical temperaments of the 18th and 19th centuries

In the 20th century, the term “microtonal” is conceivable as in any musical style the intervals in the scale differ from the others compared to the 12-tone equal temperament system. Historically accurate but different medieval, renaissance, baroque instrument tuning systems, and temperaments had an interest for many music composers and theorists of the 20th century in combining sounds and building compositional systems inspired by non-Western cultures. As early as the last century composers began to incorporate microtones into their compositional techniques introducing them in 12-TET, and dividing the octave into 24 equal tones (quarter tones), or tuning 33.3 cents to have divisions of 36 tones (sixth tones), 48 tones, 72 tones, 96 tones, etc. The others were interested in just intonation, Pythagorean, or 5-limit, 7-limit, 11-limit, 13-limit, 31-limit, and beyond tunings to “improve” the 12-TET model.

It could not be eliminated the fact that 18th- and 19th-century tunings were not equally perfect if we take a look at Thomas Young’s⁵ widely used well temperament of 19th century varied in interval relations with deviations approximately until 10 cents compared to the 12-equal chromatic scale.

Table 1. Thomas Young’s Well Temperament No. 1 (Gann 2019: 94)

Major third	Cents	Perfect fifth	Cents	Minor third	Cents
C – E	391.7	C – G	697.9	C – E _b	297.8
G – B	393.9	G – D	697.9	G – B _b	301.9
D – F _#	396.1	D – A	698	D – F	304.1
A – C _#	400.1	A – E	697.9	A – C	306.2
E – G _#	404.1	E – B	700.1	E – G	310.3
B – D _#	406	B – F _#	700.1	B – D	304
F _# – A _#	407.9	F _# – C _#	702	F _# – A	301.9
D _b – F	406	D _b – A _b	701.9	C _# – E	297.8
A _b – C	404.2	A _b – E _b	702	G _# – B	296
E _b – G	400.1	E _b – B _b	702	E _b – G _b	294.1
B _b – D	396	B _b – F	700.1	B _b – D _b	294.1
F – A	393.9	F – C	700.1	F – A _b	295.9

In Table 1 there are four perfectly just fifths F_#-C_#-G_#-A_# and the timbral variety of thirds including Pythagorean major third F_#-A_#. Looking down the first column one can notice a more gradual progression of major third sizes from C-E to F_#-A_# and back. There is only one close minor third E-G equal to 310.3 cents,

⁵ Thomas Young (1773–1829), English physician and physicist who established the principle of the interference of light and thus resurrected the century-old wave theory of light. He was also an Egyptologist who helped decipher the Rosetta Stone. He developed what is now known as Young Well Temperaments No. 1 and No. 2, the latter being very close to Francesco Antonio Vallotti’s temperament.

though there are two Pythagorean minor thirds from E \flat and B \flat . Even within the perfect fifths, there is a graduated progression from 697.9 to 702 and back down. Young described his temperament as “the best instrument makers” were practicing:

“making C : E too sharp by a quarter of a [syntonic] comma, which will not offend the nicest ear; E : G-sharp, and A-flat : C, equal; F-sharp : A-sharp too sharp by comma; and the major thirds of all the intermediate keys more or less perfect, as they approach more or less to C in the order of modulation” (Gann 2019: 95)⁶.

Although in other unequal temperaments and tunings the interval sizes significantly differ, e.g., the size of a quarter-tone (50 cents 12-TET) could be wider or smaller, or refer to the other degree in the scale. Piano technician and expert on temperaments Owen Jorgensen praised Young’s 1799 temperament as being “the most perfect idealized form of well temperament ever published” (Ibid.). It should be noted that specific instrument tuning in the previous centuries was especially important for composers to determine the sound of one or another musical work:

“As noted, to some extent the differences between these temperaments are merely theoretical. Piano tuners were guided by their experience and their own and their patrons’ taste throughout the eighteenth and nineteenth centuries, an era in which tuning was an art, not a science” (Ibid.).

Therefore, it is not a coincidence that the archival recordings of Lithuanian folk songs were selected from the 4th decade of the 20th century that could preserve other principles of instrument tuning.

Identification of microtonal overtones in Lithuanian vocal and instrumental folk music

Implementing my research of Lithuanian folk songs and their instrumental versions, firstly the distances between the intervals in the scale were identified, and secondly, the collected results were compared with two tempered systems: natural harmonic series and 12-TET. Several examples of *sutartinės* and *monodies* were taken to determine tonal distances in the scale. One of them, with a clear audible microtone, was the monody *Lėkš lėkš sakalėlis* (Fly fly little falcon; recorded in 1937). I started this research during my internship at the Sibelius Academy of Music in Helsinki. Together with composer Juhani Nuorvala, I used his microtonal instrument Tonal Plexus to detect tones by ear. In this tune, we identified the second degree with the deviation of 30 cents approximately compared to 12-TET. It was somewhat surprising to notice that the deviation corresponds to the *rast* microtone in *maqāmāt* Arabic scale.

Referring to the research of contemporary scholars, the smallest audible microtones are determined by measuring the distance from the reference tone (or fundamental) usually from 33 to 50 cents within a semitone to compare to 12-TET⁷. Identifying the intervals in the scale, a distance of limits was made for the detection of microtones from 20 to 80 cents compared with 12-TET, and until 10–15 cents for harmonics compared with natural harmonic series⁸.



Figure 3. Harmonics on C from 1st fundamental to 32 harmonic, notation is based on the extended just intonation by Ben Johnston (Gann 2019: 120)

⁶ Gann quoted from the book: Jorgensen, Owen (1991). *Tuning: Containing the Perfection of Eighteenth-Century Temperament, the Lost Art of Nineteenth-Century Temperament, and the Science of Equal Temperament*. East Lansing: Michigan State University Press.

⁷ Composers and music theorists of Western music culture proposed to divide the octave into 12 equal parts with distances of 100 cents of the semitone. Thus, a quarter-tone equals 50 cents, a sixth tone—33.3 cents, a 12th tone—7 cents, and a 16th tone—12.5 cents. In this calculation the octave is divided into 96 equal parts, thereby the semitone *b-c* consists of eight 16th tones.

⁸ “Given the described implementations of pitch scatter and formant smear in syntheses of unison choir sounds, the present experiment showed that – on the average, experienced listeners preferred pitch scatter to be between 0 and 5 cents and would tolerate scatter between 10 and 15 cents” (Ternström 1991: 48).

12-TET (tone equal tem- perament) (12)	C	C♯ / D _♭	D	D♯ / E _♭	E	F		F♯ / G _♭	G	G♯ / A _♭		A	A♯ / B _♭		B	
12-TET in cents	0	100	200	300	400	500		600	700	800		900	1000		1100	
Natural harmon- ic series in one octave (16)	C	C♯	D	E _♭	E	-F	F+, -F♯	F♯+	G	G+	G♯+	A	-B _♭	B _♭ +	B	B+
Interval distanc- es in cents	0	105	204	298	386	471	551	628	702	773	813	906	969	1029	1088	1145
Harmonic No.	1	17	9	19	5	21	11	23	3	25	13	27	7	29	15	31
Deviations in cents to com- pared to 12-TET		+5	+4	-2	-14	-29	+51, -49	+28	+2	-27	+41	+6	-31	+29	-12	+45

Table 2. Natural Harmonics and 12-TET Scales

Table 2 presents a natural harmonic series in one octave compared to the 12-TET chromatic scale. The microtonal harmonics are marked in grey color.

To measure the distances of tones in scale, I used the computer software Melodyne, which can detect sound deviations even in polyphonic music audio samples.

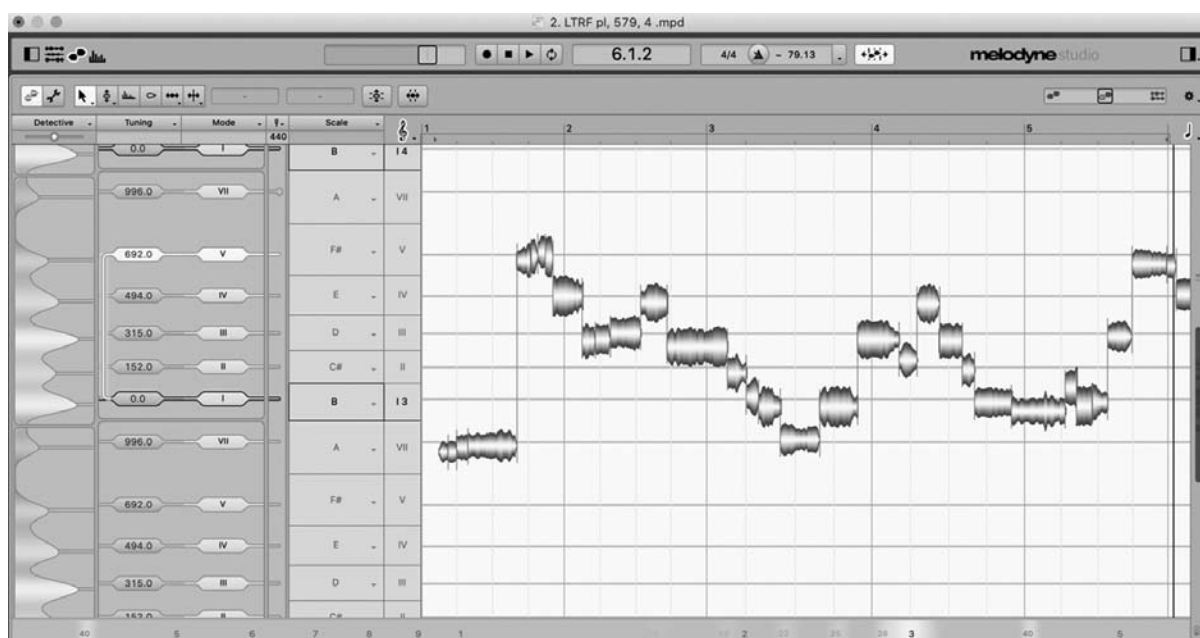


Figure 4. Interval distances in the scale. Analysis of the monody “Lėkjs lėkjs sakalėlis” (Fly fly little falcon) in the Melodyne computer software (The Institute of Lithuanian Literature and Folklore; <http://archyvas.ilti.lt/irasai>).

Table 3 displays the interval distances of the song and comparison with the interval distances of the 12-tone chromatic scale. There is a clear interval of perfect fifth calculating from the reference tone (or tonic), which constantly forms a framework of the probe tones in the scale. Therefore, the scale of six tones is arranged within the interval of a perfect fifth interwoven with neutral and microtonal interval structures. It would be pointed out an interesting shift $b-c\sharp = 152$ cents, is a neutral second (or microtone), between the whole tone and semitone, as such an interval is frequent in Arabic music⁹. The other intervals correspond to narrowed or large semitones, or whole tones, e.g. the interval $b-e$ is very close to just perfect fourth (498 cents) with the ratio of 4 : 3.

⁹ In Arabic music, the *maqam* rows are heptatonic and constructed from augmented, major, neutral, and minor seconds. Many different but similar ratios have been proposed for the frequency ratios of the tones of each row and performance practice (Touma 1996: 18).

Interval deviations from reference tone	B	C#	D	E	F#	A					
	0	+52	+15	-6	-8	-4					
Interval distances In cents	B	C#	D	E	F#	A					
	0.0	152	315	494	692	996					
Chromatic scale	B	C	C#	D	D#	E	F	F#	G	G#	A
	0.0	100	200	300	400	500	600	700	800	900	1000

Table 3. Interval deviations of the song *Lėkys lėkys sakalėlis* compared to 12-TET

Using Melodyne software, the analysis of polyphonic folk chant *sutartinė* was carried out, thus Table 4 presents the collected data: the numbers in bold with the asterisk indicate two microtonal degrees in the scale, and below the numbers in bold with the serial number indicate three harmonics—No. 5, No. 11, No. 3.

Du žaliūs berželiai (Two green little birches), LTRF pl. 189b, 1
Performers: Zuzana Yčienė, Marė Jakubonienė, Petras Lapienė, Ona Striūžienė, 1935.

SONIC CODE G_b+ A B_b+ C D_b+

SCALE	G _b	A	B _b	C	D _b
INTERVAL DISTANCES	I	II	III	IV	V
from reference tone	0.0	246*	386	559*	702
INTERVAL DEVIATION (12-TET)		-54	-14	-41	+2
HARMONICS in cents			386	551*	702
HARMONIC No.			5	11	3
HARMONIC DEVIATION			0	+8	0
DISTANCES	246	140	173	143	

* – microtone

Table 4. *Sutartinė* analysis

Table 5 presents the number of harmonics with their serial numbers that were detected in the vocal and instrumental music corresponding to the natural harmonic series from C. In vocal music I identified the most frequent five harmonics (Nos. 3, 5, 11, 9, 21) (G, E, F+, D, -F), including two microtonal harmonics 11, 21 (F+, -F), and not so frequently used harmonics Nos. 13, 25, 29, 23, 31 (G_b+, G+, B_b+, F_b+, B+) which one of them non-microtonal (No. 27) corresponds to the sound (A).

As for instrumental music, the most frequent harmonics were identified and arranged as follows:

- in the *ragas* (wooden trumpets) ensembles there are five harmonics Nos. 9, 5, 11, 3 (D, E, F+, G),
- in *skudučiai* (panpipes) ensembles—three harmonics Nos. 5, 11, 3 (E, F+, G),
- in the melodies for stringed instrument *kanklės* (instrument of the zither family)—three harmonics Nos. 3, 9, 13 (G, D and G_b).

Among the not so frequently used harmonics, I would point out the *skudučiai* ensembles—Nos. 15, 27 (B, A).

Thus, four commonly used harmonics were identified in instrumental music samples—Nos. 3, 5, 9, 11 (G, E, D, F+), one of them is microtonal—No. 11, and these harmonics are consistent with all vocal and instrumental music samples.

Harmonics No.	1	3	5	9	11	13	15	17	19	21	23	25	27	29	31
<i>Sutartinės</i>	17	8	11	5	8	1				4	1	1	1		
Monodies	20	13	7	4	6	5	1	1	1	4	2	4	3	5	1
Horns	16	12	10	15	14										
Panpipes	4	2	2		2		1						1		
<i>Kanklės</i>	4	3		2		1									

Table 5. Number of harmonics identified in the 27 *sutartinės*, 21 monodies, 12 *ragas*, 5 *skudučiai*, 3 *kanklės* recorded samples

In Table 6, the summarized data of harmonics are provided. You can see that vocal music tunes have 7 exactly produced harmonics compared to natural harmonic series, and for instrumental music, there are 2. In *sutartinės* chants and monodies 70 sounds with deviations 1–15 cents were detected, and in traditional instruments tuning, *ragas* ensembles—32, *skudučiai*—9, *kanklės*—6 harmonics, respectively.

		<i>Sutartinės</i>	Monodies	Horns	Panpipes	<i>Kanklės</i>
0 ct	-5	-	2	-	1	
-1	+1 ct	-2	-	2		1
-2	+2 ct	-2	-	2		
-3	+3 ct	-2	-	3		
-4	+4 ct	-1	-	4		
-5	+5 ct	-2	-	5	-	2
-6	+6 ct	-1	-			
-7	+7 ct	-2	-	6	-	3
-8	+8 ct	-2	-	3	-	2
-9	+9 ct	-1	-	3	-	1
-10	+10 ct	-2	-	3		
-11	+11 ct	-4	-	3	-	1
-12	+12 ct	-2	-	4	-	1
-13	+13 ct	-	-		1	
-14	+14 ct	-1	-	2	-	1
-15	+15 ct	-2	-	4	-	3

Table 6. Scale of tone deviation from the original sound of natural harmonics

Comparing the number of vocal songs with instrumental music, e.g. *ragas* ensembles have three times, and *kanklės*, *skudučiai* ensembles five, and ten times fewer examples (due to a minimal number of good quality recordings, and a small selection of performers), than compared to vocal music. Therefore, the same results as in vocal music could be tentatively obtained by multiplying the number of harmonic deviations of *ragas* ensembles by 2, and the number of harmonic deviations of *kanklės* and *skudučiai* ensembles by 5, 10. Thus, in instrumental music examples: *ragas* ensembles have 17 sounds with deviations of 1–10 cents, and 14 sounds with deviations of 11–15 cents; *skudučiai* ensembles have 8 sounds with deviations of 1–10 cents; *kanklės*—3 sounds with deviations of 1–10 cents, and 3 with deviations of 11–15 cents.

Application of interval relations of folk songs in composition

Referring to the material of my research I have selected 12 microtonal overtones to compose an original microtonal scale, which corresponds to the pitches of two harmonic series from *C* and *G*. Below you can see a chromatic scale, which consists of sounds from natural harmonic series of *C* and *G* with common tone *b* and non-systematic tone *f*. The scale forms two pentachords. Therefore, the pitches of both microtonal scale and non-microtonal scale are combined to form interval structures.

A. Scale of selected twelve microtonal harmonics from C – G of natural harmonic series

Overtones No. - 23 11 21 13 25 29 31

Overtones No. - 25 31 13 11 21 29

B. Scale of selected tones from natural harmonics series C – G

Figure 5. Microtonal and non-microtonal scales

Interval structures are built on one harmonic structure of 3 tones—trichord structure, which expands in time by adding more structures or replacing one with another. Those trichord harmonic structures are formed on the following intervals: third + second, fourth + second, fifth + second, and the seconds one after another, which include one or two microtonal sounds¹⁰:



Figure 6. Trichordal structures

Both microtonal structures of the fourth and seventh form a complex texture of harmonic structures. Thus, the selected “archaic” microtones expand and split up the intervals of the chromatic scale into a dense microtonal complex. These enriched sound structures are manifested by timbre and harmony modulations whereas the pitch reaches a certain boundary moving to one or another parameter when the pitch and the rhythm gain a new function—hierarchy of timbre (compared to the hierarchy of harmony in tonal music) is realized by the intensity of textures, registers, dynamic changes, sound-producing techniques. This process fuses the synthesis of timbre and harmony, but where is that boundary of separation when the sound parameters gain other functions and meanings?

Projections of harmonic sound structures in the composition *Bloomy Ice* for string orchestra¹¹

This piece represents the idea of timbre and harmony and their relationship in musical form. The timbre and harmony synthesize several elements amongst them the clarity of sound and the texture (smooth or rough). These elements are particularly important that influence the change in musical form. The control of timbre through the work is closely related to the tensility and statics of harmonic tissue as a contrast of smooth and dense episodes or in comparison as a shift of consonance to dissonance in tonal music. When listening to the piece we could hear more or less tension in some of the episodes that make transformations from the smooth/clear to the rough/uneven textures. Thus, the function of timbre is considered vertical and that of harmony as horizontal. Harmony often provides the impetus for rhythmical movement, while timbre constructs

¹⁰ It depends on a particular combination of microtones; the interval distances vary in each case.

¹¹ The idea to write this piece was born in Northern Scandinavia. I see the endless desert covered by ice, and under the ice—frozen multicolored plants. When the dessert is illuminated and warmed by the Sun, the underwater microscopic processes commence, awakening a fragile life for a short flowering cycle, like a colorful mirage flickering under the ice. The composition *Bloomy Ice* was premiered at the Baltic Chamber Orchestras Festival performed by St. Christopher Chamber Orchestra, conductor Modestas Barkauskas, October 29, 2020, Vilnius City Hall:

Frozen multicolored plants,
Sunk in the layers of Northern Ice.
Through the Sun's rays,
Bloom a second time.

A. A pair of microtonal and non-microtonal pitch structures



B. Microtonal series of eight or more sounds with varied interval distances between pitches



C. Microtonal glissando formed by the sequence of small intervallic relations



D. Complex of microtonal structures

1. Interval structure of perfect fourth



2. Interval structure of major seventh

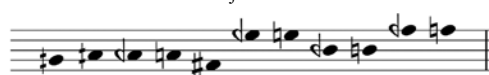


Figure 7. Other types of harmonic structures

the musical form as the leading parameter of the piece. The sound space of the work is expanded by using various sound parameters and performance techniques to reach the transitory result between textures. There are three types of textures indicated in this piece:

1. The static type of texture is characterized by linear motion, e.g. episode with solo motives, or in the episode of smoothly passing harmonics.

2. The dynamic type of texture is an articulation of musical space that reveals the creation of harmonic tension, pulsation of musical tissue with fast, accentuated, timbrically modifying sound parameters.

3. The static-dynamic type of texture is characterized by microtonal shifts, transformations of harmonic texture.

MOVEMENTS	I	II	III
BARS	1–60	61–129	130–200
TYPE OF TEXTURES	STATIC bars 1–11; 15–17; 20–23; 41–67	STATIC bars 73–78; 82–87; 94–96	STATIC bars 129–167, 195–200
		DYNAMIC bars 68–73; 79–81; 88–93; 104–128	DYNAMIC bars 168–191
	STATIC–DYNAMIC bars 12–14; 18–19; 24–40	STATIC–DYNAMIC bars 97–103	STATIC–DYNAMIC bars 192–194
DEGREE OF HARMONY PROGRESSION			
Pitch Amplitude	Low–Middle	Middle–High	Highest
Intensity of Textures:	bars 24–28; 41–48	bars 62–72; 74–85–95–103; 104–113–118	bars 165–176
Rhythmical	Low–Middle	Low–High	Low–High
Pitch Structures	Middle–High	Highest–Middle	Low–Lowest
Speed of Harmonic Tension (Tempos)	Low–Middle	Middle–High	Low–High–Middle–Low

Table 7. Structure of the piece *Bloomy Ice* for string orchestra, 2020

The realization of this network of textures is also represented by instrumental techniques, e.g. tremolo transitions from *sul ponticello*—*sul tasto* to the extreme places of bowing, microtonal motion, types of vibrato, harmonics, microtonal techniques. It is important to mention that modification of the speed of harmony expansion unfolded by different tempos supports the harmonic tensions of the piece. The structure *Bloomy Ice* presents a hierarchical system of harmony: type of textures and degree of harmony progression which includes: a) pitch amplitude, b) intensity of textures, c) speed of harmonic tension (tempos).

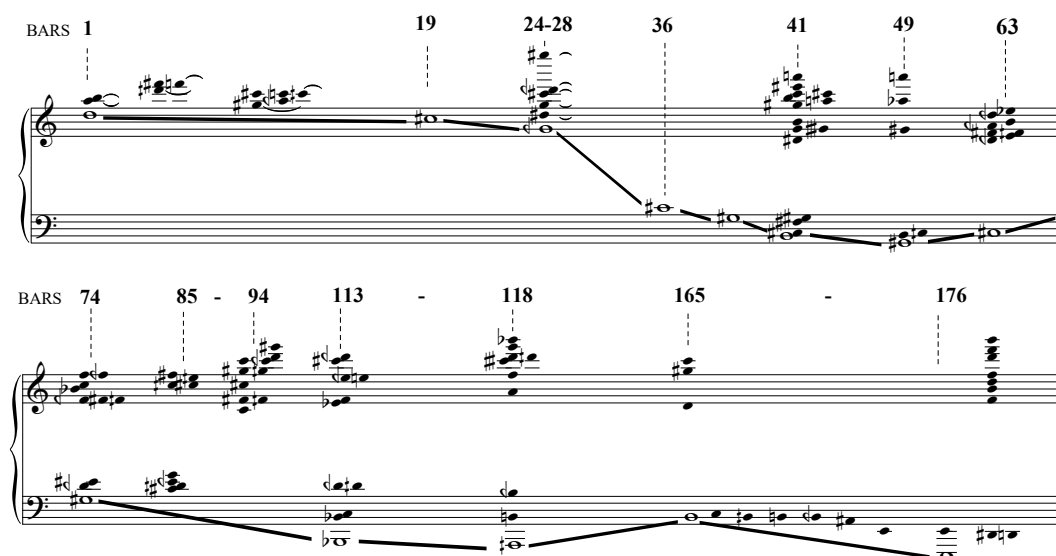


Figure 8. Teleological progression of harmony—expansion of trichord structure

The piece begins with the trichord structure from the sound *D*, which expands to the lowest *E* of the double bass at the end of the piece. The amplitude of the sound gradually increases from one to five and a half octaves. The intensity and tension of textures depend on the density of pitch structure. As the register narrows the degree of intensity increases, the layers of musical tissue become thicker, and on the contrary, if the amplitude increases, the interval distances and the tension of textures decreases.

Nevertheless, pitch amplitude and pitch intensity of textures which relates to harmony and timbre, grow opposite directions: one starts from the low amplitude to the high, and the other from high to the low intensity while the speed of harmonic tension (tempo) and rhythmical intensity have different directions, e.g. low–high–low tempo or intensity.

When writing this piece, I realized timbre and harmony as two separate but interrelated parameters. Thus, the motion of harmonic structures occurs in two modes—stable and dynamic. It begins from a stable state with clear harmonies and moves to the dynamics of timbres—i.e. unclear moving of sound structures. In this process, the progressions of chords and durations of rhythmical lines transform the harmony into timbre, evoking timbral variations separating the complex harmonies from the initial trichord structure. It is the growth and expansion of a single sound cell, which modifies the change of sound parameters through the entire piece building a large micro-interval tissue.

Conclusion

Regarding the research on Lithuanian vocal and instrumental folk music, it could be concluded that the number of harmonics with exact pitch or slight deviations in vocal and instrumental music is constant and has no significant changes. Thus, the Lithuanian vocal and instrumental folk samples have several tones closely related to the tuning of natural harmonic series, including one frequently used microtonal overtone. It could be assumed that performers of the Lithuanian folk music tradition partially reproduced tuning and interval relations of natural harmonic series. On the other hand, constant use of microtones was spotted in Lithuanian vocal monodies.

The implementation of microtones and interval structures into the compositional system was an attempt to transform the harmony into timbral sonority/extended sonority and to experiment with harmony progression of timbres throughout the structure of the piece, finding points where timbre replaces pitch as the primary parameter. In the composition of *Bloomy Ice* texture and timbre are closely linked, as the timbres have various tendencies for combination and fusion. It is important the primary selection of initial musical parameters and materials that determines a particular set of techniques, specific group of sounds unfolding the process of timbral transformation. In *Bloomy Ice* there are seven points of harmony transformation that correlate the dynamic structure—the harmony progression of timbres throughout the piece, interchanging with the levels of density and intensity of musical tissues determined by the range and number of micro-interval structures.

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Mikrotoninių santykių ypatumai lietuvių liaudies dainose. Garsaileo komponavimo aspektai kompozicijoje „Žydintis ledas“ styginių orkestrui (2020)

Santrauka

Straipsnio tikslas – remiantis lietuvių liaudies melodijose nustatytų intervalinių santykių dermėmis ypatumais, pristatyti tyrimo rezultatų integraciją komponavimo sistemoje. Šių metų pradžioje buvo atliktas lietuvių liaudies dainų ir jų instrumentinių versijų archyvinio garso įrašų tyrimas, jo metu pagal natūraliojo garsaileo intervalų atstumus, taip pat įvertinant galimą nuokrypio paklaidą, buvo išskirti būdingieji / dažnai pasikartojantys mikrointervaliniai dermės laipsniai, kurie atitinka harmonikų mikrotonus, įeinančius į natūraliojo garsaileo pirmos 31 harmonikos eilę. Tyrimas atskleidė, kad senuosiuose lietuvių liaudies muzikos pavyzdžiuose mikrotoniniai tam tikrų dermės laipsnių modeliai iš dalies artimi natūraliojo garsaileo intervaliniams santykiams (3:2, 4:3, 5:4, 9:8, 11:8, 13:8, 21:16, 25:16, 29:16, 31:16).

Tyrimo rezultatai buvo pritaikyti sudarant kūrinio „Žydintis ledas“ („Bloomy Ice“, 2020) styginių orkestrui garsailei: išskirta 12-kos harmonikų-mikrotonų seka bei suformuota nemikrotoninė dermė, esanti dviejų natūraliųjų garsaileių serijose. Mikrotonų intervalika jungiama trichordinėmis mikrotoninėmis struktūromis plečiant pirminę intervalinę struktūrą, taip susiformuoja skirtingi natūraliųjų garsų ir mikrotonų jungimo tipai. Šiame kūrinyje išskiriami ir garsinės tekstūros tipai: statiška, dinaminė ir statiška-dinaminė bei tekstūrų intensyvumo ir įtampos lygiai, pasireiškiantys garsų kiekiu, garsinės tekstūros (audinio) artikuliacija, ritmika, tempu.

Kompozicijoje šios prisodrintos struktūros išryškėja harmonijos ir tembro moduliacijomis, kai skambėjimas pasiekia tam tikrą ribą, pereinančią į vieną ar kitą parametą, kada garso aukštis, ritmas įgauna naują funkciją – ne harmoninės hierarchijos (lyginant su tonalios muzikos harmoniniais principais), bet tembrų hierarchijos, kuri realizuojama tekstūrų intensyvumo,

registro, dinaminės kaitos, garso išgavimo priemonėmis. Šiame kūrinio eksponuojama tembro ir harmonijos idėja pasireiškia kūrinio formos plėtra, t. y. harmoninio audinio sutankinimu ar išskaidymu, kaip lygaus audinio opozicija tankiam / aktyviai judančiam epizodui ar kaip konsonanso / disonanso kaita tonalinėje muzikoje. Klausydamiesi partitūros mes galime suvokti didesnę ar mažesnę vieno ar kito epizodo įtampą, kuri transformuojasi švarių garsų (beveik konsonansų) skambesio harmonija, pereinančia į tembrinius (disonansinius) dinaminės tekstūros epizodus. Taigi tembro funkcija yra vertikalė, o harmonijos – horizontalė. Harmonija suteikia impulsą ritminiam judėjimui, o tembras konstruoja kūrinio formą tapdamas pirmaujančiu kompozicijos struktūrų plėtos parametru. Tembras sintezuoja daugybę elementų, ypač kūrinio garsinę tekstūrą (audinį), išskirdamas intensyvaus tankio sluoksnius su švaraus garso linijomis. Kūrinio garsinė erdvė plečiama pasitelkiant įvairius garso parametrus bei išgavimo technikų įvairovę.

Išanalizavus lietuviškos vokalinės ir instrumentinės muzikos intervalus, galima daryti išvadą, kad tikslų ar su nedideliais nuokrypiais harmonikų skaičius dermėse yra nekintantis. Taigi lietuvių vokalinės ir instrumentinės liaudies muzikos archyvuose įrašuose randama daugybė tonų, daugmaž atitinkančių natūraliojo garsaeilio serijos intervalų derinimą (tarp jų dažniausiai pasitaiko viena mikrotoninė harmonika). Galima daryti prielaidą, kad lietuvių tradicinės muzikos atlikėjai iš dalies atkartojo natūraliojo garsaeilio intervalinius santykius. Kita vertus, buvo nustatytas pastovus mikrotonų naudojimas lietuviškose vokalinėse monodijose.

Šio tyrimo praktinė forma – mikrotoninių intervalinių struktūrų realizacija kompozicinėje sistemoje, transformuojant harmoniją tembrine sonorika / išplėsta sonorika, kai tembras keičia harmoniją ir tampa pirmaujančiu, kūrinio formą sudarančiu parametru.

Straipsnyje pristatomos šio kūrinio garsaeilio mikrotoninių struktūrų komponavimo strategijos bei teleologinio proceso aspektai kompozicijoje. Kompozicijos „Žydintis ledas“ styginių orkestrui premjera įvyko „Baltijos šalių orkestrų festivalyje“, ją 2020 m. spalio 29 d. Vilniaus rotušėje atliko Šv. Kristoforo kamerinis orkestras (dir. Modestas Barkauskas).

3

TELEOLOGINĖS	TELEOLOGICAL
ALTERNATYVOS	ALTERNATIVES
ANAPUS	BEYOND THE
NARATYVO	NARRATIVE

Decision-making in Improvised Music

Abstract. How can instrumental music that relies solely on texture for its direction be explained contextually from a teleological standpoint? In order to examine musical, cognitive, cultural, and ideological perspectives, a re-evaluation that does not only rely on accepted norms is needed.

In improvised music where the outcome of musical motion is unknown at the outset, a sense of narrative is always present within audible signs. Here we move into the philosophical realms of transvaluation and semiotics for formulative and presentational perspectives.

Sound-based instrumental music procedures are based around creating a texture from extended techniques, and strategies are built by managing tension and relaxation in unconventional ways. For example, textural ambiguity within the transformed sound event, caused by the qualities inherent in the morphology, is often intentional in the musical movement. We will investigate how pressure and dissipation are accomplished; the interplay between expressions of uncertainty and lucidity can manifest in various ways. In other words, an exploration into how the passage of sound events and aural expectation become projected strategies.

With the focus on extemporisation, a recent video produced by Kay Grant (voice) and Martin Vishnick (classical guitar) will be used to illustrate. Apprehending the music from the two instruments masked by video manipulation will show how making decisions and choices through single, successive, combined, and superimposed sounds produces a way of comprehension through a sense of coalescence.

Keywords: improvisation, sound-based, spectromorphology, narrative, interdiscipline.

1. Introduction

In this paper, I will be reporting on related topics from my research into decision-making in music that involves improvisation. It amounts to an appraisal of areas that come into consideration for more detailed future research.

There is now evidence of a large canon in the freely improvised arena. This is mainly historically manifest in recordings and descriptive writing. Significant studies can be found in various places. For example, the London Improvisor's website and David Toop's book *Into the Maelstrom*. I have laid out more details in an appendix. The content of this article is grounded on a recent online broadcast by Kay Grant (voice) and Martin Vishnick (classical guitar) called "Reciprocal Parallels"; the production was first aired on 14 September 2020 during the programme *Freedom: The Art of Improvisation*.¹

Initially, we will explore the sounds before moving on to including the images. To examine and re-evaluate the product of sound and image from a teleological standpoint we look into musical and cultural perspectives, and move past accepted norms; we will also touch on some cognitive and ideological aspects. Furthermore, for a satisfactory outcome, the dependency on building meaningful and successful musical textures is paramount. To this end, an exploration into how the motion of sound events and aural expectation become projected strategies is needed.

We will concentrate on the genre termed 'sound-based music'. As summarised by Leigh Landy: "*Sound-based music* typically designates the art form in which the sound, that is, not the musical note, is its basic unit" (Landy 2007: 17). It is obvious that music grounded on notes is constructed on the standard Western paradigm, fixed on a grid system. Trevor Wishart calls it a 'Lattice' system; however, he reminds us that "music does not have to be lattice-based at all" (Wishart 1998: 11). Music based on sound is rooted in timbres heard every day, and includes sounds that may fall between the standard Western notes (see Vishnick 2015: 150).

Sound-based instrumental music procedures focus on creating texture from extended techniques, and strategies are built by managing tension and relaxation in unconventional ways. For example, textural ambiguity within the transformed sound event, caused by the qualities inherent in the morphology of the extended technique, is often intentional in the musical movement. We will investigate how pressure and dissipation are accomplished; the interplay between expressions of uncertainty and lucidity can manifest in various ways.

From a fundamental pedagogical point of view, the reason for learning to play and control extended techniques is that these sonic designs help musicians create textural motion during improvisations; creating

¹ "Reciprocal Parallels" is a live Zoom improvisation and recording. *Freedom: The Art of Improvisation* sessions (usually held every second Monday of the month in London at the Vortex Jazz club) is curated by Orphy Robinson, Cleveland Watkiss, Tori Handsley and Paul Bradshaw – <https://www.facebook.com/587484409/videos/10159202498379410/>

textures to aid musical outcome is why extended techniques exist in managing goals. In support of this point, in *Free Composition* Heinrich Schenker mentions: “The goal and the course to the goal are primary. Content comes afterward: without a goal, there can be no content” (Schenker 1977: 5). In my performances, a musical event begins and instinctively I feel drawn forwards, anticipating and allowing textures to unfold.

Vocal and guitar morphologies will be used to delve deeper and we will look into musical textures, behaviours, narratives, and interdisciplinary endeavours. I will be touching on many and varied points, and include relevant references.

2. Texture

Given that sound-based instrumental music procedures are based around creating texture from extended techniques, for an all-encompassing view we can look to Denis Smalley’s work on *Spectromorphology*, a term he invented for defining sonic phenomena. Smalley developed the concepts and terminology as tools for describing and analysing the listening experience, particularly interaction between sound spectra (spectro-) and ways they alter and are shaped through time (-morphology); they are entirely interdependent. He says: “Something has to be shaped, and a shape must have sonic content” (Smalley 1997: 107). We will see that this term is especially fitting here as the terms also belong to other disciplines, such as visual, and semiotic, for instance.

Inspired by Smalley’s work, my thinking is to provide a framework for understanding structural relations and behaviours as experienced in musical flow. Here we can look at classifying morphologies from certain vocal and extended guitar techniques in relation to the archetypal attack/resonance/termination model, and variants of the archetype. My approach is to set out spectral and morphological models and processes (see Vishnick 2014: 5).

2.1. Functional structures of motion and growth

Expectation is an integral function of musical structures. Sound-based music is not alone when it comes to the outcome of probable designs, which are also part of cultural associations and the spectral changes perceived in many sounds. Smalley tells us that, “during listening, we attempt to predict the directionality implied in spectral change” (Smalley 1997: 114). For example, is this gesture leading to something else, or staying the same, will it merge with another sound or be interrupted unexpectedly, and so on.

onset	– attack, upbeat, downbeat, anacrusis, departure
resonance	– decay, maintenance, transition, phases, refraction, extension, damping, horizontal and vertical surface
termination	– relative silence, close, release, interruption, arrival

Figure 1. List of possible functions

In Figure 1, I have expanded archetype and variant morphologies into a list of possible functions used to interpret the significance of musical events and situations; for example, attention could be focused on types of textural growth or motion processes. A good instance for us is in the opening few seconds of “Reciprocal Parallels”, where the guitar starts with short muted morphologies that are weighted towards noise before high-pitched short vocal sounds occur. From the information in Figure 1, we can say that the *onset* of the muted morphologies is an attack followed by a very short damped *resonance* with *termination* to relative silence.

Another example that features the guitar occurs at one minute nine seconds. It comprises two “snare drum” sounds that can be explained based on trajectory occurring after an attack; utilising strings five and six, a downward microtonal glissando played at the twelfth fret that lasts approximately one second is followed immediately by a refracted resonance. The sound is interrupted by a subsequent shorter similar morphology that maintains its relative pitch for approximately half a second.

Therefore, these possible functions for motion and growth are extremely useful for considering sound-based discourse. We can no longer depend on traditional concepts of rhythm and notes to describe gestural contours when textural motion is expressed through extended techniques. Furthermore, sometimes sounds prompt me to listen to motion and growth processes outside music; therefore, it is important to think of these kinds of connections. Smalley reminds us that: “Since motion and growth have spectral contours, they

are set in spectral space” (Smalley 1997: 115). Consequently, some of the terms used in Figure 1 are symbolic of something else. Furthermore, as the sounds reside in spectral space and possess spectral density, inclusion becomes important. An example in spectral space would be when morphologies may overlap or perhaps collide. This impingement is directly related to motion and growth processes.

2.2. Behaviour

Using the word ‘behaviour’ is apt here as it allows us to develop a system to describe relationships amid varieties of morphologies that act within a musical flow. As a listener, my behavioural relationship recognition in a sound-based context is intuitive; in turn, this affects personal reacting and interpreting habits.

In the type of freely improvised music we are dealing with here, the freedom of morphological content, function, and motion serves as a referential supply, which changes over time. We can look at motion in respect to horizontal and vertical aspects of events through energy and trajectory; the context being the urgency of onset rates and the type of motion that ensues. An important feature of sound-based behaviour is where an event seems to trigger another or alter concurrent sounds.

Motion coordination in terms of vertical synchronisation – sense of proximity, togetherness expressed along a tightness/looseness axis.

Motion passage in terms of horizontal dimension – morphological direction intensity expressed as degree of energy-motion trajectory.

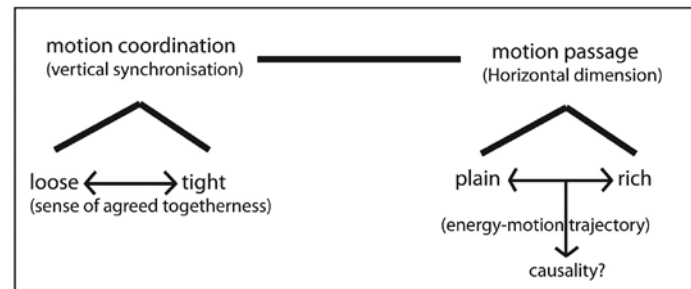


Figure 2. Motion coordination and passage

From Figure 2 we can see that a passage of motion in the horizontal dimension engenders an energy-motion trajectory, where the determinant factor is how one event appears to cause the onset of a successor or alter a coexisting event in some way; the process of one context can give way to the next. The gestural strength is directly related to how closely together the events occur within the vertical plane, factors that can be analysed as structural goals.

We note here that functional attributes to a particular context or event are not a simple cognitive process. Structural levels and effective actions of satisfactory hierarchical variety are decisions for the perceiver (see Smalley 1997: 114–115). An analysis will be based around interpreting behavioural relationships such as sounds that dominate or are subordinate or depending on their function in the discourse, perhaps ones that conflict. For example, two dominant sounds could vie for supremacy, or one may become conflicted, however, they both coexist. There are many scenarios.

In the *motion coordination (vertical synchronisation)* section, we have a sense of proximity, togetherness, expressed along an axis of looseness to tightness; we note there is always the possibility of internal change. For the *motion passage (horizontal dimension)* area, morphological direction intensity is expressed as the degree of energy-motion trajectory along a continuum of plain to rich; textures that can be described as plain and distant but full of interest to complex and pithy. Generally, strong determinant factors rely on musical gestures and coordinations that may be regarded as structural outcomes.

Moving forwards, we can take inspiration from Fred Lerdahl and Ray Jackendoff’s work in the music theory field, as aspects of their studies may prove useful for interpreting sound-based music. In short, according to its authors, the purpose behind *A Generative Theory of Tonal Music* is to “present a substantial fragment of a theory of classical Western tonal music” (Jackendoff and Lerdahl 1983: 4). Lerdahl has continued to expand his theories, in the book titled *Tonal Pitch Space* (2001), for example. The eventual goal is a theory of

musical cognitive capacity, with the proposition of a grammatical rule system as part of the analysis. Since its inception, *A Generative Theory of Tonal Music* has inspired many researchers and commentators (see Appendix 2).

Lerdahl writes about the development of a system capable of dealing with atonal music hierarchically by looking into pitch space as a mode for atonalistic structures. He argues for replacing the stability of the time-span component with “salience conditions” for dealing with the ordering scheme systems within serial music. As salience is often used in neuroscience for contrasting noise levels and in the visual system context, it may prove a useful research area for sound-based music that is tied to moving images.

For analysing sound-based structures, I can see problematical areas in Lerdahl’s model. For example, calculating the perceived distance of related sonorities in reference to interval-class content may not be appropriate for dealing with purely sound-based passages, especially where the noise to pitch ratio is high. However, developing his theories on detailing stability conditions further could prove valuable. Lerdahl’s thinking on surface tension, modes of attraction, and durational structures would be useful as part of a strategy for dealing with the pitch content within sound-based music. I will look at this for possible enfoldment into the ongoing development of my all-inclusive approach to studies of the morphology of sound, looking seriously into the areas of spectromorphology, spatiomorphology, spectral qualities, performance space, and performance aspects.²

Of course, it is possible that in sound-based music, the traditional pitch can be an important factor, especially the functionality issue of consonance and dissonance within pitch-oriented situations. Smalley explains this issue very well:

“The spectral components of the note remain largely unheard, or at least ignored because it is the note itself which matters most to the context—the note and its colour are perceptually fused. An alternative view (as permitted, for example, by a close recording of an instrumental note), takes the ear inside the note so that spectral components can be heard” (Smalley 1997: 119).

So, from an alternative view from inside a sound (for Smalley this is common in acousmatic music), pitch relationship components can be comprehended. For our study here, we note that predominantly harmonic relations will be present within vocal and guitar notes, taking into account the weighting of components of the harmonic series. We have a duality between a note when heard externally, and a sound with more complex elements when entering its interior. Furthermore, this internal spectral focus is an area for musical development in the sound-based arena for improvisers, especially when amplification is used creatively.

On occasions, pitches may move very quickly and it becomes difficult to hear intervals, or they become superimposed and dense, pitch perception significance can easily cease. Therefore, we must find a method for differentiating between intervallic and relative pitch; for the former, we can differentiate pitch-oriented intervals, for the latter we are dealing with perception within spectral space.

Approaches to merging intervallic and relative pitch are common in sound-based music. For the composer, performer, and listener, judging borders between intervallic and relative is equally valuable. Defining this boundary is not easy, as it is directly related to perceptual skills, and if pitches are present it will culturally be a natural auditory focus. Smalley tells us: “In intervallic pitch we can hear pitch-intervals, and therefore their relationship to cultural, tonal usage will become important. In relative pitch contexts, we hear with much less precision the distance between pitches and can no longer hear exact pitches or intervals in spectral space” (1997: 119). The result is an inclination to follow note combinations within gestures and motions.

It should also be noted that there is a need for more than a single pitch for it to become perceptually relevant. There may be circumstances where the pitch is a recognisable quality of a morphology, without another pitch to relate to there can be no intervallic relationship, making the sound a background factor. However, contextually there may be other significant morphological attributes.

² For the early stages of the author’s research see *Sculpting Sound on the Classical Six-String Guitar, volumes 1 and 2: A Survey of Extended Techniques with Appended Studies in New Morphological Notation* (2015), published by Create Space. – https://www.amazon.co.uk/Sculpting-Sound-Classical-Six-String-Guitar/dp/1514651157/ref=sr_1_1?ie=UTF8&qid=1446021250&sr=8-1&keywords=martin+vishnick.

More recent developments of the principles and theories into the morphology of sound can be found in *The Morphological and Audiative Interconnectedness of Sound: Equivalence in a Multidimensional Soundscape* (2021), published by ART-platFORM – <https://art-platforma.kmaecm.edu.ua/index.php/art1>.

3. Narrative

In sound-based improvised music where the outcome of musical motion is unknown at the outset, a sense of narrative is always present within audible signs, an imagined history in sound may be perceived by the listener. Here we move into the philosophical realms of semiotics and transvaluation for formulative and presentational perspectives.

In order to engage with the characterising details of musical flow, an awareness that narrative qualities have a wider representational context that connects to a personal referential code becomes important; narrativity infers the capacity to generate an imagined story world.

Ideas for ongoing narratological analysis development are necessary; therefore, finding ways to investigate communicating the concurrent events through their journey is useful. For example, analysing practices that may be used to better articulate the symbiosis between music and image that can be associated with sound-based music structures. In *Essays on Sound and Vision* John Richardson and Stan Hawkins talk about the interdependence of musical and cultural texts in relation to one another, and the assumption of an absence of fixed boundaries: “In a sonic text, other sonic texts are always present with the text, and as a temporal event, musical sound is produced as a mediator of values in relation to other texts” (Richardson and Hawkins 2007: 17). When considering how a text exists in relation to others, it is not only related to other similar genres, but to all audio-visual proceedings. How we read a series of actions or events is inexhaustible and only becomes meaningful through active reading.

Trying to properly describe the cognitive space of anyone involved in producing or listening to music is a problematic area. Research into the way that musical discourse may actuate personal traces of thought patterns and imaginary possibilities is a possible way forward. We should also note that awareness for the listener of extreme intensification of morphological activity could lead to deconstructive reasoning arising from the occurrence of the complexity of events. This is a meaningful point as although we can say that the more avant-garde practices may introduce disruption to the events, yet there is still a narrative purpose even if it seems to be very difficult to decipher.

If we wish to develop a theory of musical narrative for this genre, there is a need to look into the use of signs from a teleological standpoint. This means an examination of the critical role played by the interpreter’s perceptual, cultural, and ideological frame of reference in formulating and presenting an interpretation.

If we attempt to relate narrativity to culture and ideology, many fundamental questions arise for listening to sound-based musical structures. For example, in *New Sounds, New Stories: Narrativity in Contemporary Music* Vincent Meelberg mentions the possibilities that lie behind the narrativisation of cultural expression regardless of the creator’s intentions (see Meelberg 2006: 197). Moreover, when talking about grasping contemporary musical forms he says, “listening competencies are not fixed, but change along with cultural changes” (Meelberg 2006: 208). However, to comprehend contemporary music it becomes necessary for the listener to make an effort to learn new musical conventions.

The pedagogical development of learning to deliberately devote oneself completely to listening and explore instinctive paths that lead from the purely sonorous to the essentially musical is one of my goals. Research in this area has to lead me to link with the *Deep Listening* principles of Pauline Oliveros and the *Reduced Listening* practice expounded by Denis Smalley.

Through cultivating methods of apprehension unhindered by preconceptions, Oliveros tells us: “One of the Deep Listener’s goals is to listen to each and every sound exactly for what it is, nothing more, nothing less” (Oliveros 2005: 4). Engaging with Pauline Oliveros *Deep Listening* principle we can learn to, “remove cognitive filters in order to experience deeper forms of audition” (Ibid.). My intention is to develop tools to describe the features of perceived sounds, and explain how they work in the context of the music.

For an all-inclusive approach, a method for aurally recognising small changes in timbre is useful. Here we can tap into existing electroacoustic research, in particular the concept of *reduced listening*.³ This type of concentration occurs through focused and continual listening. For Smalley, “it is an investigative process whereby detailed spectromorphological attributes and relationships are uncovered” (Smalley 1997: 111). In order to pay full attention to refining the detail and quality of sounds, the listener tries to suppress any distractions. Smalley again: “Reduced listening is, therefore, an abstract, relatively objective process, a microscopic, intrinsic listening” (Ibid.). Therefore, concentrating on the characteristics of the sound is essential.

³ Reduced listening is a Schaefferian concept. See Schaeffer 1966 for a full discussion.

Smalley and Oliveros concur as they focus attention on how listening is an act of cognition; it can shape perception. This form of perceptual scrutiny is generally employed in the creative process. I believe it is important to bring this type of listening into the performer–listener and audience–listener arena.

From our discussion, we can see that sonic events may convey extra-musical connections that can mean many things. However, for our survey here we will concentrate on actions that relate to the two musicians. For example, the vocal sounds mean that a person created them; our internal image of someone denotes the production of these events. Aki Pasoulas tells us that listeners “are able to detect the source–cause because the sound reveals through its spectromorphology many properties of the medium with which it was produced” (Pasoulas 2011: 48). On many occasions in “Reciprocal Parallels”, the two performers are responding to audio cues that are a semiotic basis for producing morphological outcome. For example, at circa eighteen seconds the voice is emulating the guitar gesture shortly after its initiation; the singer is using the guitar morphology as a cue for a signing procedure. Then slowly the two parts start to diverge and transform into quite a different texture.

The resultant musical narrative is grounded on the commonality of the performers’ musical experiences, and there are many points of commonality. For example, both players have previously worked in a variety of genres, bringing these multiple influences to bear in the improvisation with a resulting depth of stylistic choices; both practitioners accept the notion of silence as a strength within the musical flow, and an acceptance to allow humour in music as an important aspect. The dignity and seriousness of purpose are countered by surprise and playfulness, and these attributes help to create a type of music filled with ideas, always shifting yet balanced with stillnesses that keep things buoyant without being too dense. The range of dynamics and textures, moving from softness and gentleness to more sudden bursts and expressive interjections, help to create a feeling of the story.

3.1. Interdiscipline

Let us now look closer into including another practice with the music, namely moving images, and focus on the commonalities shared between music and visual arts with an emphasis on contemporary art approaches.

As with all the arts, the visual arts are an essential part of any well-rounded curricula. We look to the expressive qualities inherent in both visual art and music that contribute to positive enhancements in social–emotional learning and student engagement. Through their inherent expressive qualities, we can delve into contributions of positive enhancements in apprehension, an area for pedagogical concern. We can seek occurrences where visual artists have been inspired by music. For example, Nick Cave has used pencils, mops, raffia grass, and a variety of other materials that when worn create subtle sound through expressive movement. These materials can be used and modified as materials to make sounds.⁴

Concerning a title for this genre, in conversation with Rodrigo Sigal, who works in this media, he says, “the best definition I have heard so far is *visual-music*”.⁵ Fundamentally, the purpose of this art is to create value by superimposing artistic visual techniques on sound, or vice versa. This is where a narrative is shaped through vision and sound to form interdisciplinary meaning. Within this medium one can develop devices that reflect and influence creative interpretation; we can play with allusion, quotation, calque, pastiche, and parody, for instance. These references may be influential for reappraising the composer/performer/listener arena and add layers of depth to the successions of events.

Here I would like to connect certain aspects of Byron Almén’s thinking on evaluating musical narrative principles and apply them to the realm of visual music, especially when it comes to a sound-based music perspective; in particular, when he talks about conceptual considerations. We can think about placing musical narratives beyond instrumental music and link to the emotive trajectory of the visual narrative; experiences and sentiments caused by the performers that are particularly acute in audiovisual settings, especially as the visuals in “Reciprocal Parallels” are so closely linked to the music. In his paper “The teleology of the sign user”, he argues that “narrativity in music can be productively understood according to the principle of transvaluation” (Almén 2014: 1). This principle can be explained as the critical role played by the interpreter’s cognitive, cultural, and ideological perspective in formulating and presenting an interpretation, and therefore describes the user in a teleological manner.

⁴ Nick Cave is an artist and educator working between the visual and performing arts through a wide range of mediums including sculpture, installation, video, sound, and performance. His best-known work in this area is the *Soundsuits* series, costumes that completely cover the individual’s body, see <https://nickcaveart.com>

⁵ Taken from an email of 22 February 2020 between Dr Rodrigo Sigal and myself – <http://15.cmmas.org/cvs/dr-jorge-rodrigo-sigal-sefchovich/>

Articulating a narrative-based theory for visual music will inevitably be complex. The integral features of the two media will obscure the disparate functions through which they are typically non-ambiguous. Usually, the related dramatic events are realised immediately by the characters, and musical narrative generally displays changes in ordering configurations through time. However, in “Reciprocal Parallels” we move into a mysterious arena where the visual blurring of the characters and the abstract nature of the music eschews a hyper-real identity. We may perceive the proceedings as real, though potentially unreal.

When viewing the narrative in “Reciprocal Parallels” in a general sense, the notion of one single correct interpretation of a work is abandoned and sensitivity to context is encouraged. We can move beyond a general usage and consider ways in which visual music may be more fully characterised; in particular, the fundamental formative roles such perspectives can play in shaping and directing interpretive details. Through technology, we can explore the interactive potentials and functions of music in combination with other narrative media, in our case film. It has become obvious that the computer screen has become a dominant medium for communication. We can now question how meaning is constituted within the interaction of different media, hence the importance of up-to-date research of visual music.

With the production process used in “Reciprocal Parallels”, the diegetic sound originates from within the film; perception of these sounds will affect one’s senses. The sound may be presented within the visual source, or off-screen. Here the visual aspect arises from the initial improvisation session but was reinitialised later. Moreover, in a showing of the film, we may perceive the visual and sound as a oneness, or separation if the speakers are remote from the images. The impact of apprehending both aspects may feel it has a linear or non-linear communication. This raised further thoughts: Does the discourse relatively possess a unified and coherent narrative, or the suggestion and the possibility of an alternative yet still viable narrative? The detail of these points may be for another paper, and studies in this area may be found.⁶

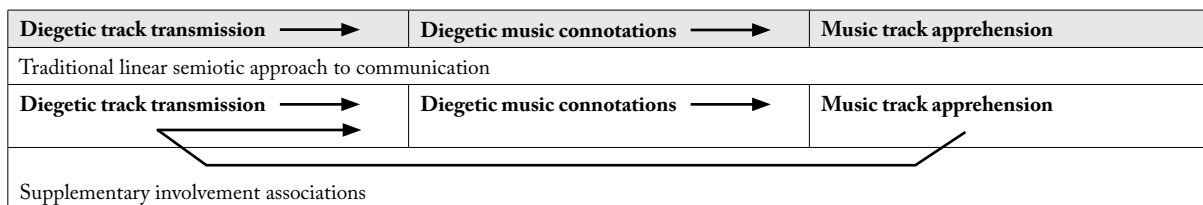


Figure 3a. Linear or non-linear pathways

Diegetic track transmission	Diegetic music connotations	Music track apprehension
Where simultaneous recording of sound and image occur	Recording seems simultaneous, but in reality is synchronised later	Recording and post-synchronised are separate
When image and sound are coherently related	Image and sound are synchronised precisely	Image and sound are related thematically, emotionally and rhythmically
Occurrence of natural sounds	Music appears to be from the natural world	Environmental music
Referentiality	Image and sound refer to something, for example, like in a dream	Dream like
Real	Real and imaginary coalesce, perhaps ideologically-based	Imaginary

Figure 3b. Supplementary involvement associations

Figures 3a and 3b draw the events together. Grasping diegetic track transmission nuances, diegetic music connotations, and music track apprehension may capture the various scenarios; plus, there is an expansion on the possible associated relationships. The diagrams show the conventional chain of semiotic communication and contributory involvement interconnections. However, we can see that involvement in the nature of

⁶ I would like to point to the reader two contemporary studies into the ambiguity of bifurcated musical narrativity, where the mixing of media generates a range of relationships; *Telling Tales: A Survey of Narratological Approaches to Music* by Russell Millard, 2018, pages 33 and 34, and *Essays on Sound and Vision* by John Richardson and Stan Hawkins, pages 15 and 16.

visual music leads to the creation of additional or entirely new meanings other than those originally intended by the improvisers. Changes in reception and transmission may occur. For example, the original comprises a video and two performers, but through own experiences, additional meanings may occur that produce supplementary connotations.

In the video “Reciprocal Parallels” by Grant and Vishnick commonalities may be apprehended; for example, a belief in the validity and strength of mixing melodic and textural contributions in improvisation. Grant was the moving-image artist for this work, and she had a vision of how the flow was to be presented using the original Zoom video as the source. In her words:

“The visual space has been manipulated into four quadrants: upper and lower halves for Martin/Guitar on the left and Kay/Voice on the right. Each quadrant has then been divided into a series of 200 vertical strips. The colours have been treated to create a richer visual experience”.⁷

It becomes obvious that the organic and dynamic strips that Grant mentions are, in fact, the two performers playing and singing in our respective environments, namely respective home studios. From observing Figures 3a and 3b, we can say that the contents of the video portray diegetic music connotations that have supplementary involvement associations in a recording that seems simultaneous but in reality, is synchronised later.

4. Concluding remarks

Morphological thinking is concerned with the perception of spectral energies and shapes in space, their behaviour, motion, and growth processes, plus their relative functions in a musical context.

For the musician or listener who is not used to sound-based music the detail of morphological description may be difficult to follow, however, there is a vast amount of work in this genre. A fundamental principle of music based on spectral morphology may be easily understood as being founded on our experience of sound apprehension. However, some extended techniques morphologies can sound remote from the source. We can see that this derivation is from a shared common base that provides a framework for individual and cultural work. Examining these links is important for all concerned and the language needs to be discovered and defined within a shared natural–cultural basis to make sense.

In order to help understand why and how the music exists, the workings of a sound-based discourse must be explained at some stage; this will also enable a means of articulating problematic reactions to particular work. This is especially important to music that is strange to comprehend immediately to a lot of listeners, particularly since traditional instrumental and vocal gestures are often absent or not immediately apparent.

Creating textures in the visual-music arena that may or may not be fulfilled by internal representation can cover a wide range of associations; therefore, human agency is required to create narrative interest. Furthermore, for me, a narration involves at least some sort of indeterminacy to create suspense, which serves the characteristic musical attributes and processes of shaping the outcome, and is played out within the various aspects of the stylistic improvisational convention and normative practice to serve either deterministically or teleologically; it is here that we garner significant discursive attention.

The next line of a research enquiry into developing the pedagogical potential embedded in this paper will be to look into correlations between Smalley’s spectromorphology principles, Lerdahl’s timbral hierarchy systems that entail salience and prolongation, and the authors work on morphology; with the goals of collecting relevant data and postulating the possible results for a comprehensive sound-based musical theory, where ordering can be redefined for morphologically oriented musical structures.

The investigation would cover the shaping of sonic content by looking into the implications of spectral change, moving beyond models rooted in standard pitch theory, and structuring archetypal and variant sounds based on the perception of morphological sound designs. For now, we have the elements to start contemplating building a theoretical system for music based solely on sound, where pitch content forms only part of the analytical content.⁸

I am going to finish with a perceptive statement by Kay in regard to the collective improvisation endeavour associated with “Reciprocal Parallels”: “The result is predicated upon our interpersonal interaction, our shared experience, our backgrounds, our inspiration, our listening and our response in the moment.”⁹

⁷ Taken from an email between Kay Grant and myself on 24 October 2020.

⁸ This would be building on Landy’s theory of note-based versus sound-based music, see Landy (2007).

⁹ Taken from an email between Kay Grant and myself on 24 October 2020.

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Appendix 1

The list below links to important information on the genre of Free Improvisation; varied sources are referenced. However, it is by no means extensive.

Books

- Bailey, Derek (1980). *Improvisation*. UK: Da Capo Press.
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Magazines

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¹⁰ Writers include Clive Bell and Phil England.

Record Labels

Davidson, Martin and Davidson, Madelaine (1974). *Emanem Records*. UK: London.

Wastell, Mark (1996). *Confront Record Label*. UK: London.¹¹ Websites: <https://www.confrontrecordings.com/> and <https://www.discogs.com/label/57933-Confront>

Zorn, John (1995). *Tzadik Records*. USA: New York City. Website: <https://www.tzadik.com/>¹²

Collectives

Morris, Lawrence 'Butch' (1997). *The London Improvisers Orchestra*. Website: http://www.londonimprovisersorchestra.co.uk/?fbclid=IwAR0kTAD3nI_e0hDpyz3_dZ18Sd2VvGjgXVVVhVUrcCcb4Bfr6kaix10uqrA¹³

Thompson, Walter (1974). *Soundpainting*. Website: <http://www.soundpainting.com>¹⁴

Appendix 2

Here is a fairly broad list of works that look into aspects of Lerdahl's award winning work; more research may easily be found.

Chattah, Juan Roque (2006). *Semiotics, Pragmatics, and Metaphor in Film Music Analysis*. PhD Dissertation: The Florida State University College of Music.

Jackson, Tyreek Antoine (2018). *The Improviser and the Improvised: The Relationship Between Neural and Musical Structures, and the Role of Improvisation*. Doctor of Education Dissertation: Teachers College, Columbia University.

Corey Knoll, J. (2006). *Prolongation, Expanding Variation, and Pitch Hierarchy: A Study of Fred Lerdahl's Waves and Coffin Hollow*. MMus Dissertation: Graduate College of Bowling Green State University.

Martinez, Cecilia (2007). *The Cognitive Reality of Prolongational Structures in Tonal Music*. PhD Dissertation: School of Education, University of Surrey.

Sprendimai improvizacinėje muzikoje

Santrauka

Kaip iš teleologinės perspektyvos galėtume kontekstualiai paašškinti instrumentinę muziką, kurios vystymo kryptis yra visiškai priklausoma nuo faktūros? Norėdami išnagrinėti muzikines, kognityvines, kultūrinės ir ideologines perspektyvas, turime iš naujo permąstyti visas šias kategorijas ir nepasikliauti vien tik nusistovėjusiomis normomis. Improvizacinėje muzikoje, kurios muzikinio vyksmo baigtis nėra žinoma, garsiniai ženklai užtikrina nuolatinį naratyvumo pojūtį. Čia mes persikeliamo į filosofines vertybių perkainojimo ir semiotinės *formuluojančios* ir *prezentacinės* perspektyvos erdves. Skambesiu grindžiamos muzikos (angl. *sound-based music*) muzikinį vyksmą palaiko išplėstinėmis grojimo technikomis kuriama faktūra, o strategijos įgyvendinamos nekonvencionalių įtampų ir atoslūgių valdymu. Pavyzdžiui, faktūros abstraktumas transformuotame garsiniame įvykyje, kurio savybės yra neatsiejamos nuo jį suformavusio morfologinio elemento, muzikiniame vyksme dažniausiai yra intencionalus. Šiame straipsnyje patyrinėsim, kaip sukuriamas *slėgis* ir *išsisklaidymas*, kokiais įvairiais būdais gali pasireikšti sąveikos tarp *netikrumo* ir *nušvitimo*. Kitaip tariant, kaip garsinių įvykių seka ir garsinės ekspektacijos tampa projektuojamomis strategijomis. Sutelkdami dėmesį į ekstemporizaciją, panagrinėsime vokalistės Kay Grant ir gitaristo Martino Vishnicko sukurta vaizdo klipą. Analizuodami muziką, sklindančią iš dviejų vaizdu užmaskuotų instrumentų, matysime, kaip pasirinkti pavieniai, vienas po kito einantys, kombinuoti ar kartu skambantys garsai formuoja tam tikrą supratimą, pasiekiamą per susiliejimo pojūtį.

¹¹ Sub-labels are *Sound 323*, *Confront Collectors Series*, *Confront Core Series*, and *London Preservation Series*.

¹² The label was established by composer and saxophonist John Zorn, specialising in avant-garde and experimental music.

¹³ The London Improvisers Orchestra is dedicated to free and conducted improvisation. It is currently run by a small group of players connected to the groups' origine.

¹⁴ Soundpainting is the universal multidisciplinary live composing sign language for musicians, actors, dancers, and visual Artists.

Pixelation as a Teleological Strategy in Music Composition

Abstract. This paper explores how the visual process of pixelation can be manifested in novel teleologies for acoustic music composition through ekphrastic notions of transmedialisation. Beginning with definitions proposing to support the decentralisation of ekphrastic musicology, this paper introduces the practical phenomenon of pixelation, as well as transmedializing the visual to the aural through drawing upon areas such as ‘graphical ekphrasis’, ‘sonification’, and linguistic concepts of metaphor and metonymy. By means of demonstration, this paper then provides three case studies in pixelated teleologies within the author’s music (*DISSOLUTION*, *All Dead Paper*, *Pixelating the River*), focussing on the encompassing idea of a ‘teleology of failure’ that manifests itself at multiple parametric levels, all intimately connected to the pixelated visual representations used as musical generators. Through this analysis, it is hoped that pixelation can be seen not only as a useful teleological strategy for the formal concept of music composition, but also as a metaphorical scaffold upon which compositional process and poetics can be holistically synthesised.

Keywords: composition, pixelation, teleology, ekphrasis, transmedialisation.

This paper will explore how the visual, computational process of pixelation can be manifested in novel teleological approaches to acoustic musical composition, serving as both a meaningful musical generator and as a heightened poetic metaphor. It is an opportunity to explore and extend the author’s work on “graphical ekphrasis” (Metcalf 2020) by looking at how contemporary compositional designs themselves can be used to highlight, or obscure, musical semiotics in the creation of robust structures; all connected to the varied levels of pixelation that are used as generators.

1. Definitions

It is first necessary to define some terms for the purposes of clarity, namely, “graphical ekphrasis”, and “pixelation”. Graphical ekphrasis is a term used by the author to extend upon Siglind Bruhn’s “musical ekphrasis”, which she defines as “[a] transformation of messages—in content and form, imagery and suggested symbolic signification—from one medium to another” which focuses on the “transmedialisation” of a text into music (Bruhn 2000: xvi). Some examples of ekphrastic music cited in Bruhn’s study include Schoenberg’s *Verklärte Nacht* (1899), and Elliott Carter’s *Concerto for Orchestra* (1969) which both focus on poetry, as well as John McCabe’s *The Chagall Windows* (1974), based on the eponymous stained-glass work. Traditional ekphrastic thought relies on the transmedial process to relate one defined artistic object (painting, poetry, etc), into another. The extension into “graphical” ekphrasis treats the entire space of the source material as this artistic object, moving the onus away from the idea of ekphrasis as something that privileges the notion of the “artwork”, thus attempting a decentralisation of ekphrastic thought and process. This does not deny either the transmedialisation or the ekphrasis of the space, since the key tenets of musical ekphrasis are still present: a transformation of messages in content and form, image, and suggested symbolic signification. In this way, graphical ekphrasis incorporates ideas of *sonification*, if we take Carla Scaletti’s definition as acceptable for this term:

a mapping of numerically represented relations in some domain under study in relations to an acoustic domain for the purposes of interpreting, understanding, or communicating relations in the domain under study. (Scaletti 1994: 224)

Comparing Bruhn’s and Scaletti’s definitions for the two terms, one can find some crossover in their common goal. Graphical ekphrasis acts as a merger of the two viewpoints, highlighting the imagery and symbolism of Bruhn’s musical ekphrasis, with the mapping and communication of empirical relations in Scaletti’s sonification. In linguistic terms, one could then argue that graphical ekphrasis is an example of both metaphor and metonymy in action, using the definition below, with the former representing imagery, and the latter the communication of relations in the observed domain:

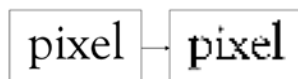
Metaphor is based on perspective change and looking for *similarity under the new perspective*; metonymy is based on perspective change and contiguity relationships, such as relationships of part-whole, cause-effect, means-end... (Bartsch 2002: 55)

The summation of this, then, is that through unified logical and metaphorical structures, communication to listeners can be heightened, and engagement widened. As well as this, composers can mount novel responses to any represented space, and create axioms that demonstrate their own personal impression of that space (accounting for educational and preferential biases). The incorporation of compositional systems into extra-musical stimuli thus will create a musical structure that is likely not immediately foreseen by the composer, which is uncovered through iteration.¹ Indeed, in his book on musical metaphor, Michael Spitzer makes the argument that “by letting music structure itself, we obtain (musical) structure without structuralism” (Spitzer 2004: 135). This notion will become clear as the discussion moves to pixelation as a teleological strategy.

Pixelation is a term used to describe a computational process carried out upon an image, whose purpose is to obscure the visual representation. Daniel Chandler and Rod Munday offer these two definitions:

1. (television) An effect that turns a video picture into a mosaic of squares, which is often used in news programmes and documentaries to conceal sensitive information such as car number plates.
2. (computer graphics) A mosaic effect, especially when an image is magnified—revealing that it is made of a series of pixels. (Chandler & Munday 2020)

These definitions, whilst achieving the same visual effect, differ slightly in their process, and this is fundamental in approaching pixelation musically. The first pixelation method, rather than magnifying an image, changes the pixel size of the presented image by resampling (either up or down) and then applying an algorithm such as a “near-neighbour interpolation”. In this pixelation method, the entire image remains as the source input, yet the values of sampling and interpolation (i.e. changing pixel size) are altered. A demonstration is given in Example 1 using an online pixelation tool, changing the pixel size (as defined by this tool) of a representation of the word “pixel” from 1 to 10:



Example 1. An example of the first definition of pixelation

The second pixelation method involves magnification of a portion of an entire image in order to reveal its pixel layout. As such, the entire image does *not* remain through the pixelation process, and a bound, or frame, is imposed on the area that is to be magnified. Anti-aliasing algorithms often try to correct for this, particularly when being printed, as it is seen as an undesirable visual effect, instead representing it as a blur where pixels are not visible. An example on the same image is shown in Example 2:



Example 2. An example of the second definition of pixelation

The distinction between these two processes is important as they allow for different explorations of compositional processes and musical representations that affect a work’s teleological function. Through exploration of three works, I will demonstrate the value of pixelation as a compositional tool, and therefore, the effectiveness and depth of graphical ekphrasis in contemporary music.

2. Pixelation in Practice

2.1. Failure as a teleological process | *DISSOLUTION* for organ (2020)

DISSOLUTION is a work for solo organ, composed for Daniel Mathieson, which explores twelve increasingly pixelated representations of a map of the River Thames. The piece begins with an un-pixelated (or original) image and ends with a single pixel as a result of the vastly increased pixel size. This graphic trajectory is

¹ Defined here as the repetition of a process. In this musical context, the process of transmedialisation will be iterative such that the results produced are in some way consistent.

mirrored by a harmonic one. The piece generates a pitch set from projecting the map into a pitch–time space, and transcribing the results, as seen in Example 3:



Example 3. Initial pitch set derived from River Thames graphic in *DISSOLUTION*

Over the course of the piece, the pitch sets are “averaged” in order to emulate the near neighbour interpolation that is happening in the visual input. This process is shown in Example 4 for Part One:



Example 4. Pitch averaging process in *DISSOLUTION*

As a result, the available pitches and harmonies not only reduce over the course of the piece, but become increasingly dissonant as a result of the averaging process, such that there is only a single three-note cluster aligned with a single pixel in movement XII.



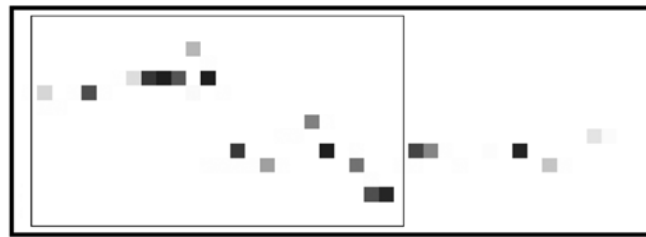
Example 5. Pixel layout and performance instructions of movement XII of *DISSOLUTION*

This is the *structural* process of failure that outlines the entire piece, and it acts as a sonified scaffold upon which to mount an ekphrasis through the incorporation of musical metaphor and communicative semiotics. First, however, it may be useful to demonstrate how pixelated images can be used to generate material, as this often defines the characteristics of movements, and thus the creation of dramaturgy in the construction of the “failure” metaphor.

The piece is structured in three parts: “Representations” (movements I–III), “Pixelations” (movements IV–VIII), and “Obfuscations” (movements IX–XII), and one could argue that musical processes in each part are considered under these headings. For example, at the beginning of Part Two (“Pixelations”), an isorhythm is constructed from the pixel layout which is used for the whole of the fourth movement, which opens dissonantly with the two parts playing apart at interval class one. It is arguably the simplest music so far, and it communicates both the “dot-like” pixel characteristic, as well as the idea of a kind of computational

“processing” error—it is the first overt sign of “failure” within the structure, and is aligned with a process that sonifies the pixel layout obviously and incessantly.²

IV: derivation of talea/isorhythm



Pixel layout: 1 (2) 1 (2) 6 (1) 1 (1) 1 (2) 2 (1) 3

Molto energico $\text{♩} = 344$, $\text{♩} = 172$



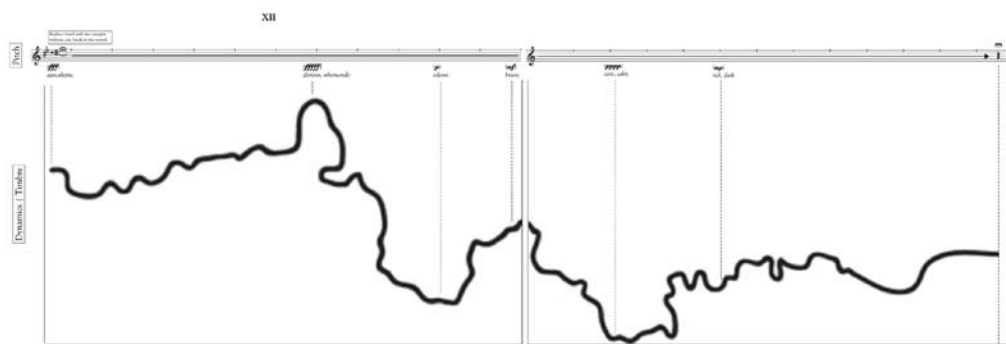
Example 6. Processes of pixelation in movement IV of *DISSOLUTION*

Looking to movement VIII, the end of Part Two, one can see a further reinforcement of a processing error through the disintegrating, or “glitchy” accompaniment figure in the left hand, along with brusque interjections of clusters that are aligned to the pixel layout. The culmination of this gesture that begins in IV finds its resolution from b. 30 in VIII, where the music completely ruptures, causing a breakdown of the musical “machine”, represented by a 12-tone chord at the loudest dynamic in the piece (*ffff*).

Example 7. Bars 28–39 of movement VIII of *DISSOLUTION*

Part Three’s pixel processes are much looser as a result of this rupture, and the final movement epitomises this relegation (or inability) of control through the presentation of a graphic score, which uses the original image, where the organist must modulate timbre and dynamics to interpret the contour of the map: the composer has, in a sense, failed in the transmedialisation process from visual image to determinately-notated score.

² All of the pieces discussed in this article are available at www.thomasmkmetcalf.com



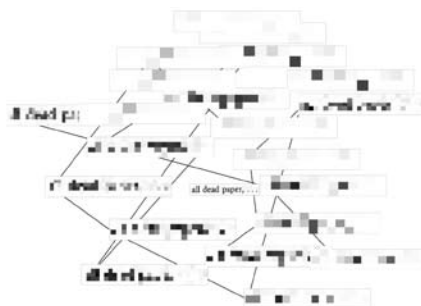
Example 8. The first half of movement XII of *DISSOLUTION*

Also, the “non-specific” nature of the registration markings (using just expressive terms) has meant that, to an extent, the organist has been in dialogue with the music and constructing an interpretation of the failure narrative timbrally that goes beyond the composer’s initial aural intention and control. As Andy Hamilton summarises, “[a]ll skilled action is at some level improvised beyond a supervisor’s instruction and therefore creative” (Hamilton 2020: 68), and this inversion of musical control, a realisation of improvisation, is a counterpoint to the loss of musical data in the graphical source. The expressive possibilities of this piece will vary wildly depending on the organ that is used, and the organist who is playing it, and crucially whether the registration process was collaborative or not. All of these considerations will ultimately affect the communication of the teleological goal.³

The relation of pixelations to macro-structure, micro-process, and musical narrative makes this piece strongly graphically ekphrastic and imbue it with a teleology of failure, where the loss of data in the visual representation is mirrored closely in the musical materials. The realisation of this failure is the teleological goal of *DISSOLUTION*, with the final movement acting as the catharsis of the piece that re-contextualises the preceding music, and this teleological failure is achieved through both a formal sonification of failure as well as a metaphor of it.⁴

2.2. Non-linear teleological failure | *All Dead Paper* for soprano and viola (2020)

All Dead Paper is a work for soprano and viola, written for Sarah Dacey and Stephen Upshaw as part of the *Nonclassical Academy 2020*. It uses the same pixelation type as *DISSOLUTION* but aims to create a different representation of the pixelated images; namely by arranging them into “pixel arrays”. Instead of using a river map, this piece variably pixelates the phrase ‘all dead paper’ (taken from Elizabeth Browning’s *Sonnets from the Portuguese*, No. 28 (1846)) which was then arranged freely onto a single display. In these arrays, all pixelations are represented simultaneously, and through the use of a random number generator, the composer moves through each representation once, without repetition, until all have been used. The pixel array for *All Dead Paper* is shown in Example 9.



Example 9. Pixel array using the phrase “all dead paper...”

³ For more on the collaborative process behind this work, see Mathieson, Daniel & Metcalf, Thomas (2022), “The ‘Graphical’ Scaffold: Approaching Composition and Performance through the Lens of Timbral Diversity.” In: *The Journal of the Royal College of Organists*. Vol. 15, forthcoming.

⁴ The full score of *DISSOLUTION* is available at <https://thomasmkmetcalf.com/media/#solo>

The pixelation processes lie with the viola, which represents the array, with the soprano becoming affected by it as a result. Three axioms were introduced to realise the pixel representations and an illustrated example can be seen in Example 10:

1. The number of horizontal units determined the durational unit of that pixelation group.
2. The number of vertical units determined the density of the attacks, up to four (for quadruple stopping).
3. The colour of the pixel generally determines dynamics (dark = loud, light = soft).

Example 10. Bars 1–3 of *All Dead Paper*, showing links to pixelations

The rules achieve a consistent system of composition that relates levels of pixelation to one another in a compact and adjacent sense (unlike in the longer structure of *DISSOLUTION*). As such, it is a sonification of the pixel array through the mapping of parameters to data. The random nature of moving through the arrays denies a linear sense of teleology moving from pixelation to pixelation, and thus the metaphorical aspect of the music (portrayed by the soprano) is integral in achieving coherence, as well as a graphical ekphrasis, that will fulfil the teleological failure. The soprano part exists in three sections, and these sections are highlighted through a shared durational unit between viola and soprano that aligns with “all dead paper” (the pixelated phrase).

Example 11. Disintegration of the vocal part in *All Dead Paper*

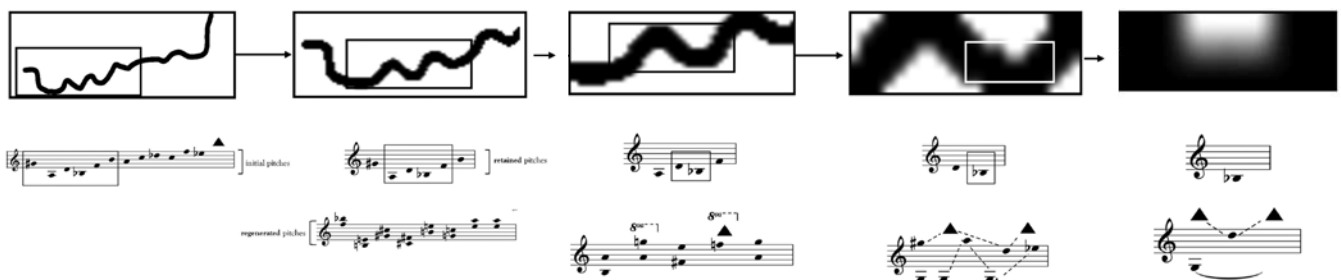
As can be seen, the text becomes increasingly nonsensical as a result of the progressive metaphor of pixelation, with the final section introducing phonemes, rather than words. The alignment and deployment of these shifts are aligned with the most pixelated material in the viola, meaning that the new sections follow chaotic passages of very short durations. As such, the connection to speech breakdown is linked with higher levels of pixelation, where pixelation in the viola has been established through means of duration, density, and dynamic. This heightens the metaphor and allows for a teleology to emerge which centres on the speech itself, arguably the most easily comprehensible aspect of the music. The fulfilment of this teleology is at the point of termination, where the voice produces a non-sibilant sound, and the viola uses scratch tone: both denying their normative playing functions and sounds in order to represent rupture as well as the end of the pixel array.

Both *DISSOLUTION* and *All Dead Paper* can be situated in Kim Cascone's notion of the "aesthetic of failure", where he describes that "our control of technology is an illusion" (Cascone 2000: 13). Pixelation is a degenerative visual process, from terms of representation, and one cannot (easily) control the algorithm that is used. As a result, the composer allows the music to structure itself, but when the structure is inherently one of degeneration then failure becomes a fundamental aesthetic quality of the work itself. Indeed, Cascone continues that, "[n]ew techniques are often discovered by accident or by the failure of an intended technique or experiment" (Ibid.). This could be true of novel teleologies as well—the teleological catharsis of *DISSOLUTION*, the graphic score, was a result of the failure of the process to generate any meaningful material with which to create a musical realisation; it is an exploitation of the terminal nature of the pixelation process.

Example 12. The ending of *All Dead Paper*

2.3. (Re)constructive teleology | *Pixelating the River* for string quartet (2020)

Pixelating the River is a large-scale work written for the Kreutzer Quartet as part of the project *Pixelating the River: Engagement with contemporary music through graphical inputs*, funded by The Oxford Research Centre for the Humanities, which was premiered in May 2021.⁵ Its harmonic structure is directly linked to pixelated representations of the River Thames, but this time using the second type of pixelation discussed above: magnification. The river graphic was divided into quarters and assigned to one of the quartet instruments. Each quarter was then projected into a pitch-time space in order to derive a pitch set that is inherently linked to that section. A section of that quarter is then magnified, and re-projected into a pitch-time space, deriving a secondary harmonic field that is linked with the first: these are the **regenerated pitches**. However, the portion of the graphic that is magnified carries through its pitches into subsequent iterations: these are **retained pitches**. A summary example is shown in Example 13.



Example 13. Summary of harmonic fields in Quarter 1 of *Pixelating the River*

This process is applied to all quarters of the graphic to create a harmonic structure for the entire piece. As well as structuring the piece, this process also sets up harmonic tensions between retained and regenerated

⁵ The concert can be viewed here: <https://youtu.be/fad1WN0BRkA>

pitches, which act as analogous to the representational tension between the original image and the magnified, or distorted, images. Indeed, this could be pragmatically characterised into “foreground” and “background” procedures and their balances. An example of this can be seen at rehearsal mark P, where the quartet is split to represent the two harmonic fields at once:

Example 14. Example of “retained” and “regenerated” pitches used at rehearsal mark “P” of *Pixelating the River*

The structure of the quartet is signified through the use of graphical insertions of the river into the score, with the instruction, “all lines are interpreted as glissandi; as if flowing through a river”. These moments are concluding points of harmonic fields, and their usage allows for the coherence of both “types” of material and the prevailing harmonies. A similar graphic practice can be seen in Kenneth Hesketh’s *Forms Entangled, Shapes Collided* (2012), where freeform lines are drawn in certain parts (usually isolated within textures) instructing the execution of a harmonic glissando which matches the contour of the graphic, and these moments happen between movements I, II, and VI.⁶ Techniques such as this not only signify a change in modality (from 12-tone to indeterminate glissando), but also allow for the construction of a sonic *ductus*: a palaeographic concept in which the work leads you through itself in its visual presentation and features of production.

⁶ For more on this, see Metcalf, Thomas (2021): Labyrinths, Liminality, and Ekphrasis: The Graphical Impetus in the Music of Kenneth Hesketh. In: *Tempo* 75(295): 45–71.

87

A. Fl.

B. Cl.

Perc.

Vln.

Vc.

pp (*icy!*) *poco*

sim.

p (*soito voce, molto misterioso*)

p (*soito voce, molto misterioso*)

p *sonore*

pp *molto espress. e drammatico*

p

* see footnote arco, sul pont.

(mba.)

Tam-tam

c. 45"

vib. ord

→ bow pressure ord.

all lines are interpreted as glissandi, as if flowing through the river; change bow ad lib.

solo

64

Vln. I

Example 15. Hesketh, "Forms Entangled, Shapes Collided" bb. 87–90 (above); Violin 1 "solo" in *Pixelating the River* (below)

In *Pixelating the River*, this ductus is also visual in two senses. The use of the specific graphic as a performance instruction further bolsters the sonification and metaphorical aspects of the graphical ekphrasis. Moreover, the fragmentation of the original set, through retained pitches, acts as an analogy to the magnification process that happens in the pixelation process. The teleology is based upon the de-construction of these rows, and their situation in surrounding material (the regenerated pitches). In the same way that we focus on a single pixel through magnification, the set narrows to reveal a key pitch that is the culmination of a process of obfuscation. In this sense, the teleology of the work exists as four "arrivals", where the tensions of the pixelation process are set up in the preceding music.

Through this logic, the piece should feasibly end after the fourth, and final, graphical insertion. However, this is not the case. The final section of the piece exists as a contracted analogy for pixelation itself. The brash, unison music of rehearsal mark Y is unfurled in such a way that subsequent parts become audible (away from the whole); much like how pixels become visible through magnification. This is sonically signified at rehearsal mark CC, where the quartet is in four different metrical layers which disintegrate to a sparse texture, representing a move from high data to low. The final section elongates all "initial pitches" in harmonics, therefore referring to the opening material but also, for the first time, using these pitches *simultaneously*. In the same way that the magnifications are a relation to their original image, one must also acknowledge that these four quarters, when assembled, make a whole. This is the true teleological goal of *Pixelating the River*: **re-construction**.

Relentless ($\text{♩} = 98$)

322 328 332 333

Vln. 1
Vln. 2
Vla.
Vcl.

fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.

↓

333 339 345 351 357 363 369 375 381 387 393 399 405 411 417 423 429 435 441 447 453 459 465 471 477 483 489 495 501 507 513 519 525 531 537 543 549 555 561 567 573 579 585 591 597 603 609 615 621 627 633 639 645 651 657 663 669 675 681 687 693 699 705 711 717 723 729 735 741 747 753 759 765 771 777 783 789 795 801 807 813 819 825 831 837 843 849 855 861 867 873 879 885 891 897 903 909 915 921 927 933 939 945 951 957 963 969 975 981 987 993 999

Vln. 1
Vln. 2
Vla.
Vcl.

fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.

↓

339 345 351 357 363 369 375 381 387 393 399 405 411 417 423 429 435 441 447 453 459 465 471 477 483 489 495 501 507 513 519 525 531 537 543 549 555 561 567 573 579 585 591 597 603 609 615 621 627 633 639 645 651 657 663 669 675 681 687 693 699 705 711 717 723 729 735 741 747 753 759 765 771 777 783 789 795 801 807 813 819 825 831 837 843 849 855 861 867 873 879 885 891 897 903 909 915 921 927 933 939 945 951 957 963 969 975 981 987 993 999

Vln. 1
Vln. 2
Vla.
Vcl.

fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.
fff incessant, malleo incessante
ord.

Example 16. “Unfurled” presentation of previous unison material, b. 322–333 of *Pixelating the River*

CC Liberamente, disintegrating (l'istesso tempo)

339 345 351 357 363 369 375 381 387 393 399 405

Vln. 1
Vln. 2
Vla.
Vcl.

ppp blared
ord.
ppp blared
ord.
ppp blared
ord.
ppp blared
ord.

III
I
II
IV

fff
f
fff
f

↓

339 345 351 357 363 369 375 381 387 393 399 405

Vln. 1
Vln. 2
Vla.
Vcl.

ppp blared
ord.
ppp blared
ord.
ppp blared
ord.
ppp blared
ord.

Example 17. Disintegration of quartet texture in the penultimate section of *Pixelating the River*

Example 18. Ending section of *Pixelating the River*

3. Concluding Remarks

This paper has introduced pixelation as a teleological function of acoustic music composition. It has shown that through the application of both formal and poetic procedures, the pixelation metaphor can be constructed alongside the sonification of its properties; thusly creating a sonic representation of the image(s) which can allow for heightened teleological communication to audiences and performers. This expands graphical ekphrasis to a form of “double ekphrasis”, something concerned as much with the musical representation of spaces themselves, but also interested in the *movement between spaces*, and how this can factor into music’s structural and teleological properties. The effectiveness of this, or any graphic approach, can be demonstrated through Jeffrey Kallberg’s study of genre when he states that,

[a] kind of “generic contact” develops between composer and listener: the composer agrees to use some of the conventions, patterns, and gestures of a genre, and the listener consents to interpret some aspects of the piece in a way conditioned by this genre (Kallberg 1988: 243).

The communication of graphical aspects of contemporary music can fit into this “contract”, where the sonification (or more empirical) aspects of the transmedialisation from visual to aural, are mediated through a metaphor of culturally understood notions of what these images represent, e.g., pixelation as failure or obfuscation. In this way, we should understand graphical (or transmedial) composition of this kind as a “genre” in itself. Therefore, we can interrogate previous examples of the genre throughout contemporary music history, and its writing more generally, uncovering communicative and formal aspects of the music that may be overlooked in traditional analytical approaches.

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Pikseliacija kaip muzikos kūrinio teleologinė strategija

Santrauka

Šiame darbe tyrinėjama, kaip vizuali pikseliacija gali tapti akustinės muzikos teleologiniu komponavimo pagrindu. Pradedant ekfraziškos muzikologijos decentralizacijos sąvokomis, šiame straipsnyje pristatomas praktinis pikseliacijos fenomenas ir transmediacija iš vaizdinės sferos į girdimąją, paliečiant tokias sritis kaip „grafinis ekfrazis“, „sonifikacija“, lingvistiniai metaforų ir metonimų konceptai. Pagrindinė idėja yra prielaida, jog ekfrazinis atvaizdavimas neprivalo būti sukoncentruotas į vadinamąjį „meno kūrinį“, bet jis gali atspindėti bet kurią transmediaciniam procesui tinkamą erdvę. Taigi sujungtų erdvių judėjimas (pavyzdžiui, vis didesne pikseliacija pasižymintis paveikslėlis) gali išplėsti ekfrazę iki kažko panašaus į dinamišką „dvigubą ekfrazę“, kur vaizdo atvaizdavimas garsinėje dimensijoje yra toks pat svarbus, kaip ir atvaizduojamų erdvių judėjimas. Čia ir glūdi tokių procesų kaip pikseliacija panaudojimo muzikoje teleologinis aktualumas.

Straipsnyje pateikiama trijų autoriaus kūrinių, kuriuose panaudota pikseliacijos teleologija, studija. Čia itin svarbiu aspektu tampa „nesėkmės teleologijos“ idėja, kuri įvairiai pasireiškia daugelyje parametrų, glaudžiai susijusių su vaizdinėmis reprezentacijomis kaip muzikos generavimo priemonėmis. *DISSOLUTION* (2020) panaudota lineari „nesėkmės teleologija“: palaipsniui pereinant nuo aukštos raiškos į žemą, nuolat didinamas šaltinio taškų (pikselių) dydis, kol belieka tik vienas taškas. *All Dead Paper* (2020) iliustruoja taškų masyvo (angl. *pixel array*) idėją, kai panaikinamas linearus, kryptingas pikseliacijos laukų judėjimas ir atveriamas kelias atsitiktinumui, kuris turi būti realizuotas trumpoje muzikinėje struktūroje, kad sukurtų koherentišką „nelinearią teleologiją“. Kitaip nei prieš tai aptartuose kūriniuose, *Pixelating the River* „nesėkmės teleologija“ yra taikoma kaip rekonstrukcijos priemonė – pasitelkiamas vaizdo išdidinimas (priešingai pikselių dydžio kitimui). Taip kuriami „išlaikytas“ ir „regeneruotas“ harmoniniai laukai kūrinio struktūroje padeda išlaikyti didelės apimties (30 min. trukmės) teleologinę koherenciją.

Šiomis analizėmis siekiama parodyti, jog pikseliacija gali būti panaudota ne tik kaip perspektyvi teleologinė strategija, muzikos formos koncepcija, bet ir kaip metaforiniai „pastoliai“, ant kurių pasilypėję galėtume holistiškai sintezuoti poetiką ir kompozicinius procesus.

Microdimensional Shaping of Glissando: Nakas's *Nude* (2004), Janulytė's *Radiance* (2015), and Mažulis's *Solipse* (2018)

Abstract. In 1991, Douglas Keislar, the editor of the Perspectives of New Music journal forum that dealt with the issues of microtonality, raised the question “Why the interest in new tunings?” and noted that “nonstandard tunings offer a means to breathe new life into minimalism”. One should agree that composing with microtones re-emerged in Lithuanian music in the last decades of the 20th century as a response to the impulses of the international avant-garde. Attempting to systematize the ways of microtone integration in Lithuanian music scores, one would distinguish two directions principally based on ornamental and structural approach, resulting in the expansion and enrichment of major-minor system as well as using microintervals as independent elements of the system or joined with other techniques such as serialism, minimalism etc. The article provides the examples with a detailed comment on the music of Lithuanian composer Šarūnas Nakas, Justė Janulytė and Rytis Mažulis.

Keywords: microtone, quarter-tone, microdimensional glissando, Šarūnas Nakas, Justė Janulytė, Rytis Mažulis.

In the last decades of the twentieth century, microtonality, as a way of music composing, re-experienced a growing interest. In 1991, the Perspectives of New Music journal initiated a special chapter dedicated to the questions of microtonality in today's music. Douglas Keislar, the editor of the forum and author of the introductory text, raised the question “Why the interest in new tunings?” One of the encouragements, to a large extent, was the influence of rapid progress in information technologies. As Keislar pointed out, “computers and microprocessor-controlled instruments have alleviated the problem of performance difficulty” (Keislar 1991: 174). Aesthetic flexibility was another factor in the revival of microtonality because “nonstandard tunings offer a means to breathe new life into minimalism” (Ibid.). Here a remark by Hugues Dufourt comes to mind, which states that in the last decades of the twentieth century, the musical/sound space was perceived as “an element of new sound plastic”. The latter quotation by Dufourt comes from his book *Musique, pouvoir, écriture* (1991), where Dufourt captured the rich contexts and music aesthetics of Paris group L'Itinéraire (also represented by Tristan Murail, Roger Tessier, Gérard Grisey, Michaël Levinas), later labeled as spectralism.¹ One should have to say that the idea of sound plasticity was soaring in the atmosphere more broadly, e.g. at the time, Horațiu Rădulescu raised his idea of sound plasma, publishing a fascinating theoretical text, which he called “a prose composition and a piece of music simultaneously”, in 1975.² Another example comes from French composer Pascal Criton, who focused on microtonal harmonies as well and has stated about her 1980s piano pieces that she claimed “to reach molecular material, to fluidify the material of sound” (Dosse 2010: 446).

However, the characterization of microtonal music and composing with microtones remains under consideration. In general, the diversity of descriptions is typical of naming the microtone phenomena itself. According to Lydia Ayers's listing in her 1994 thesis, we find several alternatives to cover the term “microtonal” (Pertout 2007: 1):³ “tuning”; “microintervals”; “macrointervals” (or “macrotones”); “omnitonal”; “omnisonics”; “neoharmonic”; “xenharmonic”; “exploring the sonic spectrum”; and non-twelve”. The latter concept prompts us to add the term “atwelve-tone” (“atwelve-tonality”), which in 2001 was proposed by Julia Werntz, an American composer and musicologist and a representative of the Boston Microtonal Society to generalize the harmonies mismatching the 12-tone model (Werntz 2001: 189–90). The provided listing may include some earlier dated references such as: “quarter-tone” (as common as “microtone”), which theoreticians used as early as the seventeenth and eighteenth centuries to explain the ratio between enharmonic diesis and flat; “achromatic”, which was chosen by Behrens-Senegalden to explain his quarter-tone experiments with instruments in 1892; “bichromatic”, used by Willi Möllendorff in his 1917 text; and Wyschnegradsky's visionary idea of “ultrachromatics” from the 1920s that brings together several interrelating micro-dimensions, and thus the microintervallic domain becomes inseparable without the micro-rhythmic and micro-durational techniques.

¹ A quotation by Dufourt was presented in an interview by Lithuanian musicologist Vita Gruodytė with composer Justė Janulytė (Gruodytė 2013: 38).

² Horațiu Rădulescu's *Sound Plasma: Music of the Future Sign*, Munich: Edition Modern, 1975. The text itself was completed two years earlier, in 1973.

³ Adrián Pertout refers to Lydia Ayers' DMA thesis *Exploring Microtonal Tunings: A Kaleidoscope of Extended Just Tunings and their Compositional Applications* (University of Illinois, Urbana-Champaign, 1994: 1–2).

But while Ayers advocates for the term “omnitonal”, San Diego composer Ivor Darreg exploits the Greek word *xenharmonic* as “especially apt for radically different tunings” (Keislar 1991: 173), yet, as Navid Bargrizan has noted, “these different systems have one characteristic in common: they all reject the dominance of twelve-tone equal temperament and attempt to break through its limited, monolithic scope”.⁴ Thus it would be accurate to say that the variety in the names for the microtone phenomenon reflects the multiplicity of the ways microtones are expressed in music texture. However, the most common is the focus on the music interval alongside the division of the octave, which may be represented in different models like various results of equal division as well as historically fixed and artificial tunings featuring microtonal relations (e.g. for Gardner Read, who attempted to collect the types of microtones in his book on microtonal notation [Read 1990], a starting point is the division of the octave).

The presented observations allow me to discuss probably the most general viewpoint regarding the use of microtones that I call a bipartite approach. For example, William Reilly Ayers focuses on two groups of composers who “desire an *expanded* musical palette” and those who look for “an *altered* one” (Ayers 2018: 1), while Julia Werntz proposes “division between composers using just intonation and those choosing to ‘add pitches’ to the usual twelve-tone scale”, i.e. a *rejection*/correction and simple *expansion* of the established 12-tone equal temperament (Werntz 2001). One could add Frank Denyer’s “distinction between the ‘tuned’ (using justly tuned intervals) and ‘untuned’ (not using justly tuned intervals)” (Ayers 2018: 4), as well as Georg Friedrich Haas’s distinction between *evenly* and *unevenly* structured music scales (Haas 2003). Furthermore, I would provide an observation by Lithuanian composer Rytis Mažulis, the brightest figure in Lithuanian contemporary music, who faithfully deals with microtones in his oeuvre: “The composer, who decides to deal with microtones in his composition, should first make a choice whether he is going to use microtones as a *decorative tool* or as a *structural element*” (Mažulis 2015: 159) [italics by R. P.]. Elaborating the latter statement by Mažulis, I would suggest a framework for classifying cases of micro/quarter-tone application in works by Lithuanian contemporary composers, from Kačinskas’s experiments to the compositions of today, by distinguishing between two groups with generally juxtaposing compositional intentions: 1) decorative/non-systematic and 2) structural/systematic application of microtones.

1. Non-systematic type includes the occasional and sporadic employment of micro/quarter-tones, mostly for coloristic purposes such as an aspiration to add some variety to the traditional 12-note musical texture; such integration of micro/quarter-tones results in the coloring of traditional harmony and even evokes disorder (or accidental/false sound).⁵ The ways micro/quarter-tones can be integrated for this purpose include the following:

- ornamentation, “inflection” of traditional tones/pitches, creating effects close to, for example, a traditional trill or vibrato;
- coloring of unison with subtle deviations, i.e. “multiplication” of unison when the main tone/pitch is surrounded by its “doppelgänger”, in other words, secondary tones/pitches, though attributed to the main tone-field, deviate from the central tone by distances smaller than a semitone;
- creation of a sleek transition from tone to tone, i.e. emphasizing microtonal transition, inserting additional pitches in between the semitones and thus creating an effect of smooth and sleek glissando;
- preference for employment of un(de)tuned (non-clear or even “false”) harmony, creating unclear chords, seeking to escape from the still-potent remnants of the classical tradition;
- stylization of sound by inserting certain tones/pitches typical of non-Western harmonies.

2. The systematic type includes music scores based on a particular type of logic and a system applied to the whole musical work. This can be achieved using the following:

- employment of a certain scale that already exists or is specially designed and consists of microtonal relationships, etc.;
- application of a specific tuning based on or with added microtones;

⁴ Cited from Navid Bargrizan’s course description on intonations, tunings, scales, and microtonality in Euro-American art music, https://www.navidbargrizan.com/uploads/5/4/8/1/54814981/bargrizan-syeminar_in_microtonality_tuning_and_intonation.pdf, access: 28.10.2020.

⁵ As Antanas Kučinskas, a composer and musicologist, pointed out, Lithuanian composers mainly tend to use microtones in order to avoid/reduce the sense of tonality or tonal sound (Kučinskas 2003: 13).

- application of the glissando phenomena as the overall model; that is, the principle of glissando in parallel to certain compositional rules determines the whole structure of the composition;
- creation of an all-encompassing compositional system, combining different parameters and creating a micro-dimensional network.

Later in my article, I focus on music scores by three Lithuanian composers, Šarūnas Nakas (b. 1962), Justė Janulytė (b. 1982) and Rytis Mažulis (b. 1961), providing the creative treatment of glissando as an overall construction for music composition.

Microdimensional Shaping of Glissando. Case studies

Šarūnas Nakas's *Nude* for symphony orchestra (2004)

The search for new types of expression exploiting various treatments of sound is typical of Šarūnas Nakas's, who has earned a reputation as a "transgressor" of accepted norms, presented his innovative works based on Dada, Merz and the ideas of futurism as early as in the 1980s, music. Thus the use of quarter-tones is sequential in his music experiments as well. Nakas's *Wings to Cross the Abyss* for alto saxophone (1996) along with the three-part cycle for ensemble, *Chronon* (1992–1996), namely in part one, *Sources. Birds*, and part three, *Sea. Sky*, present a systematic use of quarter-tones employing the 24-TET⁶ division throughout the work alongside a serial-like approach. Among other bright examples of the systemic use of 24-TET in Nakas's oeuvre that were carried out later, I would mention the pieces for ensemble, *Aporia* (2001) and *Eyes Dazzled by the North* (2004), as well as his symphonic score *Nude*, composed in 2004. The latter composition exposes the principle of glissando designing the overall structure of the opening section, which manifests as a constantly enlarging "sound cloud" in the strings and is based on precisely written out quarter-tones creating an ascending and descending glissando-like effect centered around its axis (pitch B3).⁷

The composition of the introduction reveals a rationalized and precise calculation typical of Nakas. In the span of 36 bars, the Lithuanian composer designed 19 simultaneously sounding quarter-tone lines performed by 19 string instruments. All instruments start their quarter-tone ascent or descent from the same pitch, the initial B3. Gradually moving further, the parallel melodies arrive at the final chord/cluster consisting of 19 tones and ranging from D2 to G5# (see Fig. 1 and 2). Moreover, the principle of gradual motion is applied to the level of dynamics, creating a sequence of dynamic markings from *ppp* to *ff* with the climax in m. 21 (that is very close to the golden section). Looking at two-tone clusters appearing in the most important

locations of the introduction (that is, climax and final chord) we come to the symmetric structure forming around the centre – the initial tone B3 (see Fig. 3; the symmetrical shape of "growing" glissando cluster in mm. 1–36 is represented in Fig. 4).

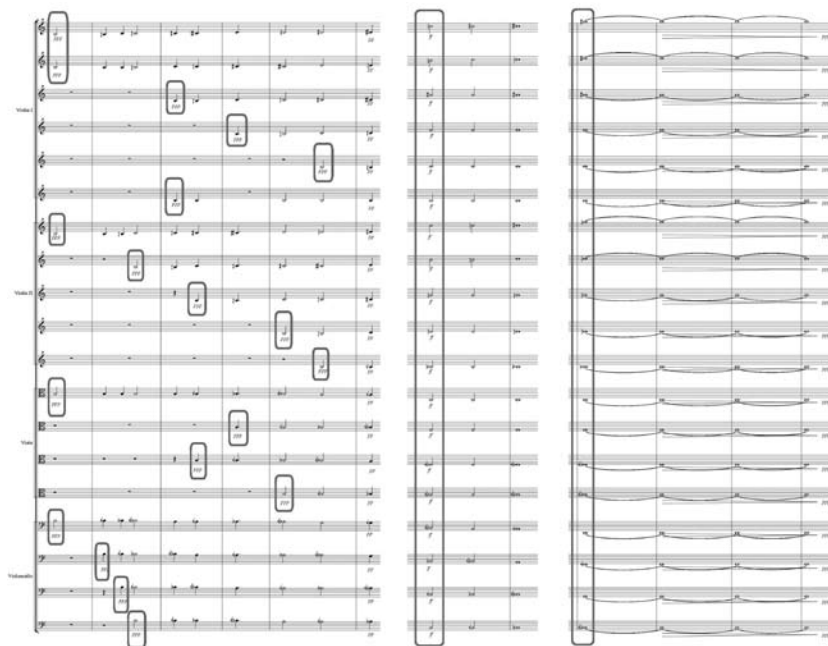


Figure 1. Nakas's *Nude* (2004). Fragments of the introduction: mm. 1–6, entrance of strings; m. 21, dynamic climax and chord structure; mm. 33–36, final cluster of 19 tones from D2 to G5# concluding the quarter-tone glissando.

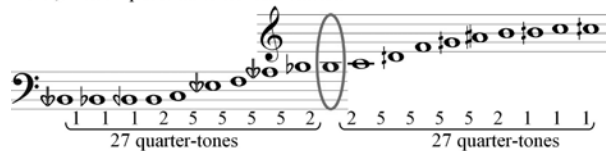
⁶ 24-tone equal temperament.

⁷ For indicating certain pitch I apply the International Standards Organization (ISO) system for register designations where the middle C is C4.

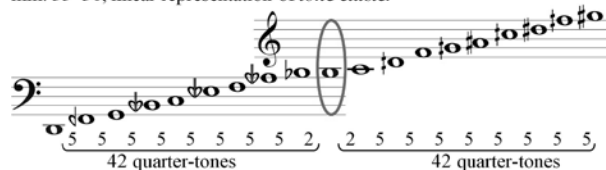


Figure 2. Nakas's *Nude* (2004). Ascending scale in 1st violin part, creating quarter-tone glissando, mm. 1–36.

m. 21, linear representation of tone cluster



mm. 33–36, linear representation of tone cluster



symmetrical reduction in the range of octave around the axis

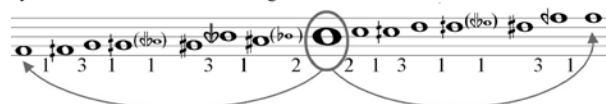


Figure 3. Nakas's *Nude* (2004). Linear representation of tone cluster in m. 21 and mm. 33–36, and symmetrical scale in the range of octave around B3. Numbers 1, 2, 3, and 5 indicate the distance of quarter-tones.

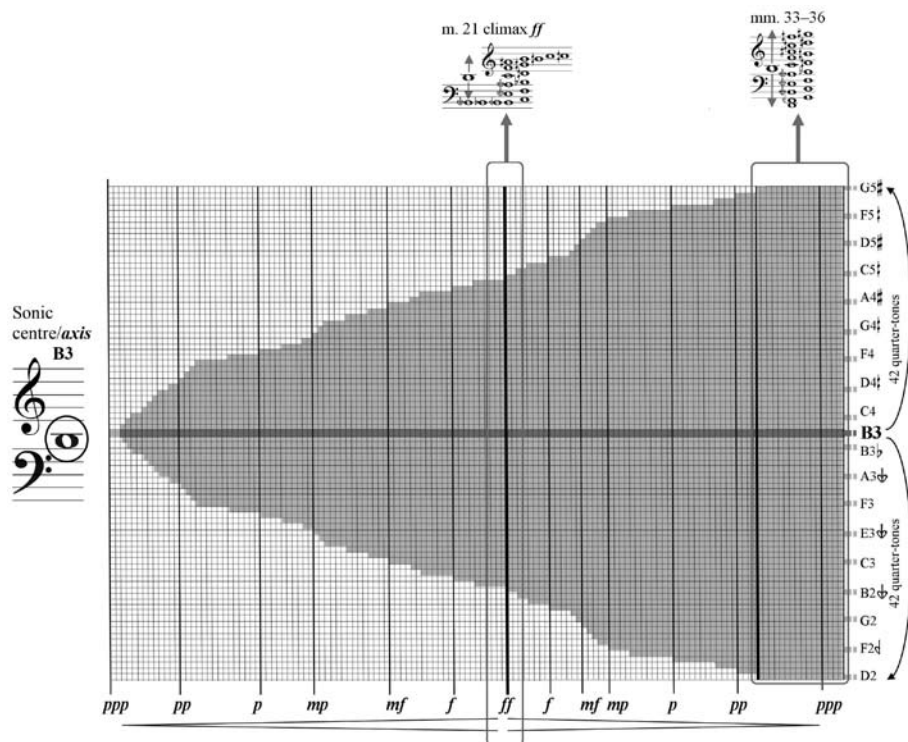


Figure 4. Nakas's *Nude* (2004), introduction, mm. 1–36. Graphic representation of scale ascension and descension, creating quarter-tone glissando, from the single tone B3 to the cluster of 19 tones in the range D2–G5 centered on the axis B3.

Justė Janulytė's *Radiance* for choir and electronics (2015)

The complete music composition arising from a certain sonic centre is typical of some Justė Janulytė's works too. She employs a slow transition from one chord to the other, resulting in extremely slowed down motion like zooming into the very depth of sound, its essence. According to Vita Gruodytė, Janulytė's music is somewhat of "a promenade in the space of sound ... as if we were inside the sound trying to catch the shadows of sound" (cited from Gruodytė 2015: 3).

Commenting on the glissando-like approach in Janulytė's music I should note that the composer operates with the ordinary 12-TET scale, and the microtonal sound is only perceptible as the result of glissando yet not fixed or controlled otherwise. Prior to concentrating on Justė's choir piece, *Radiance*, I would provide a comment on her seminal score *Sandglasses* for four cellos, live electronics, video and installation (2010), where the composer systemically applied glissando that is materialized by a polytemporal canon and lasts exactly 50 minutes: the initial unison D5 splits off (see Fig. 5), and four cellos continue to move further from each other and reach the lowest note at different moments. Though the descending tones form a G harmonic minor scale, however, recording the long-lasting tones, and then repeating them slower, the overall sound results in a dense microtonal texture.⁸ In some sense, *Radiance* for mixed choir and live electronics (2015) follows the technique implemented in *Sandglasses*: a gradual expansion of two initial tones with a metaphoric reference to the nuclear explosion (see Fig. 6).⁹ Starting with an octave of tone A (sopranos and altos sing A4, and tenors and basses start singing A3), the groups of voices gradually move up and down musically imitating the process of radiating and splitting (see Fig. 7). Such a process determines the structure of the composition expressed as an overlap of two antiphonal processes of radiation that lasts 30 minutes. Though the score uses regular notation, similar to *Sandglasses*, the subtle and non-simultaneous transitions create the microtonal effect. Therefore Janulytė's composing motto resembles the microtonal approach, just like looking through the telescope focused on the atoms of sound.

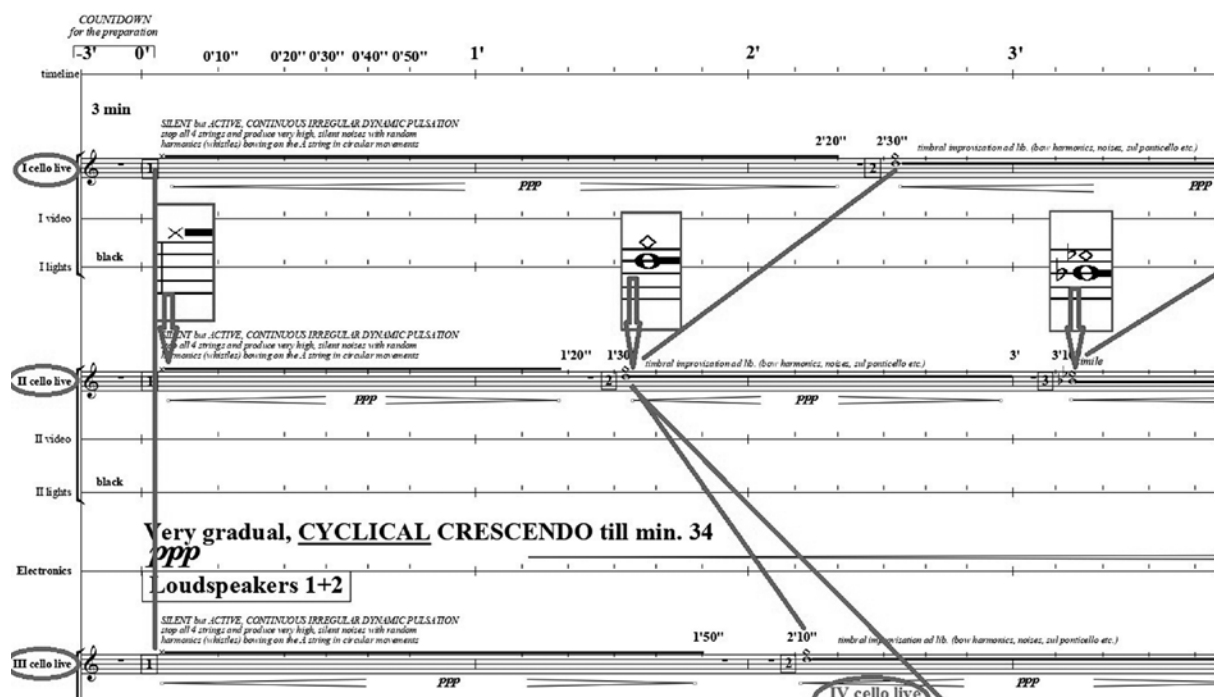


Figure 5. Janulytė's *Sandglasses* (2010), beginning. Non-simultaneous split off from initial tone D5.

⁸ By the way, as in the case of Nakas's *Nude*, Janulytė applies gradually increasing dynamics from *ppp* to *fff* and backwards, arriving at the climax at the 34th minute (an approximate golden section of total duration).

⁹ In the score annotation, Janulytė provides a fragment by Julius R. Oppenheimer, scientific director at the Manhattan Project, from his speech after the first artificial nuclear explosion *Trinity test* near Alamogordo, New Mexico, on July 16, 1945: "If the radiance of a thousand suns were to burst at once in the sky, that would be the splendor of the mighty One. I am Death, the destroyer of worlds." (A quotation from *Bhagavad Gita*, Chapter 11, shloka 12, and Chapter 11, shloka 32.)

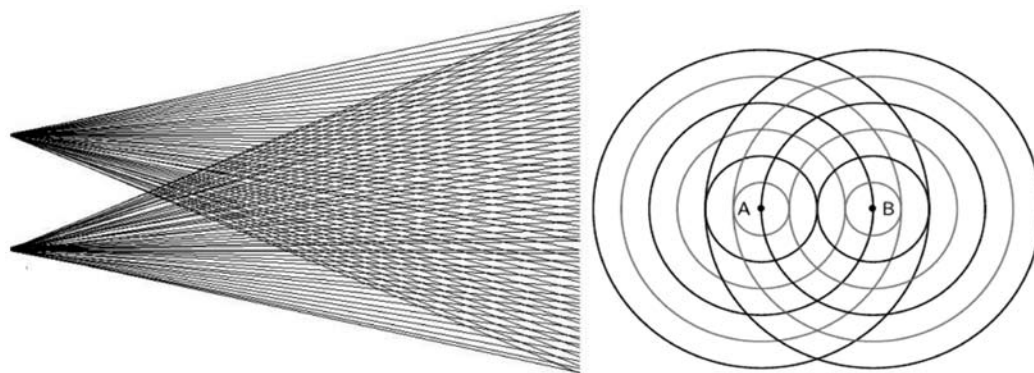


Figure 6. Janulytė's *Radiance* (2015). Image of an explosion as a design for the expansion of unisons and overall structure.¹⁰

gradual CRESCENDO until 4'

-1' 0' 0'30" 1' 1'10" 1'20" 1'30" 1'40" 1'50" 2' 2'10" 2'20" 2'30"

recorded whistles start from almost *mormodando*, slowly opening the mouth within the dynamic crescendo

S.1 AOUIEUOA*)
S.2 UOAIEAO*)
S.3 IOUAEUOI*)
A.1 EOUIAUOE*)
A.2 OAUIEUAO*)
A.3 AUOIEOUA*)
T.1 AOUIEUOA*)
T.2 UOAIEAO*)
T.3 IOUAEUOI*)
B.1 EOUIAUOE*)
B.2 OAUIEUAO*)
B.3 AUOIEOUA*)

Dynamic markings: *pppp*, *ppp*, *pp*, *p*

Figure 7. Janulytė's *Radiance* (2015), beginning. Split off from two initial tones A3 and A4.

¹⁰ Graphic sketch provided by the composer.

Rytis Mažulis's *Solipse* for cello and electronic tape (2018)

Showing a long-lasting creative application of microtones in his compositions, Mažulis presents a true fascination in possible tone divisions that started in the 1980s and 1990s with spirals of whole-tone scales (e.g. his canon *The Dazzled Eye Has Lost Its Speech* for four voices, 1985) and structures containing superimposed thirds (e.g. computer pieces *Canon aenigmaticus*, 1990–1992, and *Clavier of Pure Reason*, 1992–1994). Later, Mažulis turned to the micro-world and a variety of semitone fractions and started to experiment with one-center generated sound structures (e.g. *Palindrome* for computerized piano, 1996), composing music derived from a single melodic pattern, or even one note.

“Microdimensional” is probably the most suitable concept for Mažulis's style (Daunoravičienė-Žuklytė 2016: 320). The impression of chaos created out of a diligently constructed simple order would describe his music laboratory too. For example, *Ex una voce* (2004) is based on a single melody multiplied into 13 parts that are performed at different tempos and create an impression of disorder.

Having in mind the rich variety of microtonal results in Mažulis's oeuvre,¹¹ in this article I delve into the analysis of one of his recent works, *Solipse* for cello and electronic tape (2018), intended for 32 cellos – one live performer and 31 pre-recorded samples. The piece brightly presents an especially elaborated and sophisticated approach to canon technique and microtonal divisions. The composer applies the so-called microdimensional approach to several parameters of the composition, including tone division and tempo fractions according to strictly calculated rules. Therefore, the overall structure of the composition builds up, let's say, an image of multi-dimensional glissando:

- first, a polytemporal effect is achieved by gradually slowing down the tempo. A map of tempos for live cello part (see fig. 8) indicates the strict slowing down of metronome marking per one second every next note or measure (i.e., the tempo in the first measure equals 60 per quarter; in the second – 59 etc.); thus the first note continues one second while the final note, numbered as 69, lasts sounding for 10 minutes;
- second, starting with tone C6 the melody descends in subtle distances that are recorded in cents. The calculation of the required cent amount for every next tone is based on the summing note number and cent amount of the previous tone. When the summing of cents comes up to 100, the composer starts from 0 again. The overall calculation of the first live-cello part is as follows (see also Fig. 8):

(C6) c – **1st tone** is equal to 0 cents, **2nd tone** – 1 cent lower (because 1st tone + 0 cents = 1), **3rd tone** – 3 cents lower than 2nd tone (because 2nd tone + 1 cent = 3), **4th tone** – 6 cents lower than 3rd tone, **5th tone** – 10 cents lower, **6th tone** – 15 cents lower, **7/21**, **8/28**, **9/36**, **10/45**, **11/55**, **12/66**, **13/78**, **14/91**;

b – **15/5**, **16/20**, **17/36**, **18/53**, **19/71**, **20/90**;

b-flat – **21/10**, **22/31**, **23/53**, **24/76**;

a – **25/0**, **26/25**, **27/51**, **28/78**;

g-sharp – **29/6**, **30/35**, **31/65**, **32/96**;

g – **33/28**, **34/61**, **35/95**;

f-sharp – **36/30**, **37/66**;

f – **38/3**, **39/41**, **40/80**;

e – **41/20**, **42/61**;

e-flat – **43/3**, **44/46**, **45/90**;

d – **46/35**, **47/81**;

c-sharp – **48/28**, **49/76**;

c – **50/25**, **51/75**;

b – **52/26**, **53/78**;

b-flat – **54/31**, **55/85**;

a – **56/40**, **57/96**;

¹¹ E.g., in *Sybylla* for mixed choir (1996, commissioned by the contemporary music festival Gaida) Mažulis employed $\frac{3}{4}$ intervals and endless canon moving in a circle that is possible to design geometrically; the subtle piece *ajapajapam* for 12 voices, string quartet and electronics (2002) features the intervals of 3.333 cents moving in a very slow glissando, gradually expanding into six-part texture and canonically descending a minor sixth; the use of quarter-tone series and their inversions as well as mensural proportions (6 : 4 : 3 : 2 : 1 : 2... etc.) is typical of Mažulis's *Canon mensurabilis* for six instruments (2000); *Cum essem parvulus* for eight voices (2001) manipulates by using the microtones of 20 cents and a polytemporal system that creates a palindrome shape; while his *Schizma* for 14 flutes (2014) is a result of polytempos at production of microintervals of different size, dividing the semitone into 24–49 equal parts and applying a similar procedure to the time values.

g-sharp – 58/53;
 g – 59/11, 60/69;
 f-sharp – 61/28, 62/88;
 f – 63/49;
 e – 64/11, 65/74;
 d-sharp – 66/38;
 d – 67/3, 68/69;
 c-sharp – 69/36.

- third, every next cello enters the same pitch C, but at a different tempo that is a second tempo from the previous cello part (i.e. if the first-live cello is marked in seconds 60, 59, 58, 57, 56, 55, ..., then the second cello/1st pre-recorded sample starts at 59, 58, 57, 56, 55, ...; the third cello at 58, 57, 56, 55, ... and so on; see Fig. 9);
- fourth, despite every next cello entering with a slower tempo, the total duration of the performance is equal to the first live cello (i.e. every next cello part is digitally stretched to the original “size”, so its duration in seconds deviates from the original series in seconds).

I would note that number 69 serves as a structuring measure for the composition. Firstly, in total, Mažulis designed a series of 69 notes, descending from C6 to C4#. Secondly, the composer applied 69 different tempos: the duration of the piece was determined in advance when he chose the starting tempo mark 60. Respectively it was possible to slow down the tempo up to 1 (in total 60 different tempos) plus composer divided value 1 into tenth parts resulting in 9 additional tempos (obtained dividing 1 into 0.9, 0.8, 0.7, 0.6 and so on) – thus getting 69 different tempos.

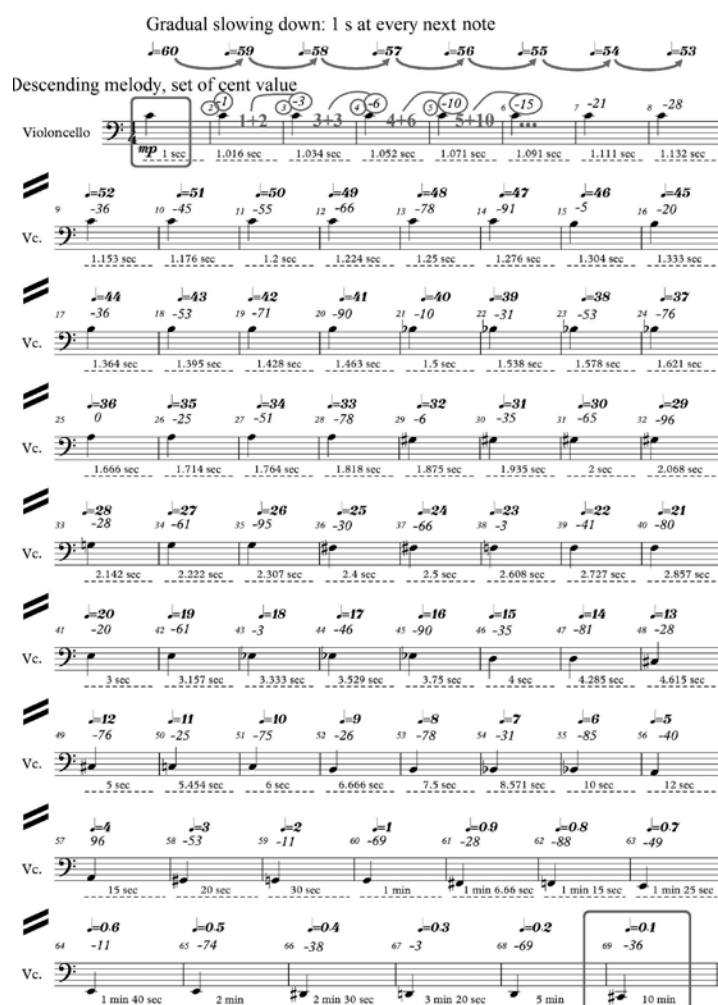


Figure 8. Mažulis's *Solipse* (2018), the map of gradually slowing down tempo designed for a live cello part

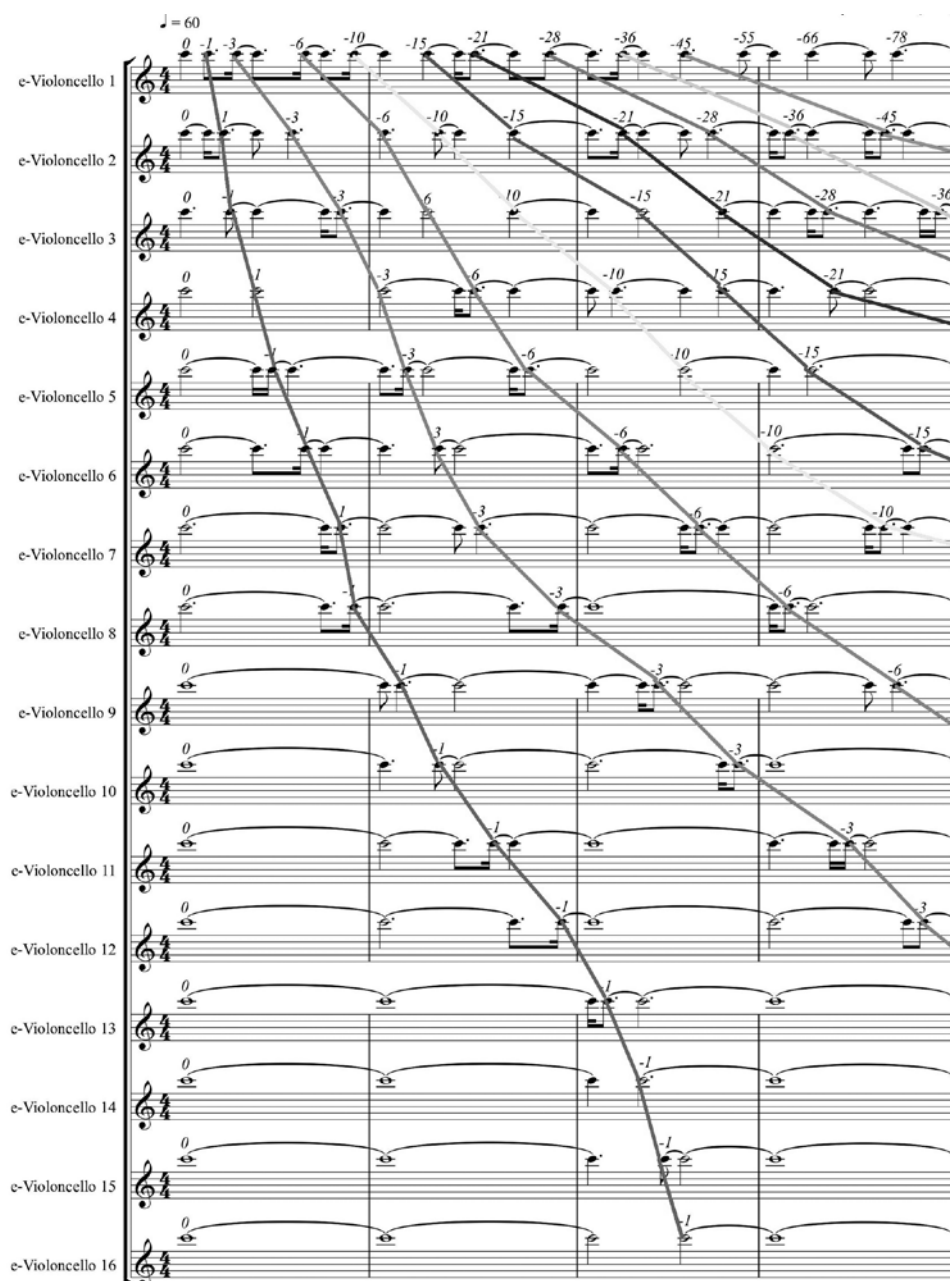


Figure 9. Mažulis's *Solipse* (2018). Graphical reduction of the score, 1–16 cellos, mm. 1–4, presenting the overall form of the composition

The *Solipse* score is an example of a strongly technologized process of creation as well as performance. Due to very complicated and strict scores, Mažulis has reduced the personality of a performer to a nearly mechanical state, while the audience also encounters challenges. Also with the help of the computer Mažulis can operate maximally reduced intervals that are hardly perceptible by ear.¹² However, there is no stop sign for Mažulis, whose sound world is immersed deeply into microscopic tone-divisions up to 1 cent. In *Solipse*, in his own words, the composer has achieved the maximal purity of creative mind expression, obtaining a highly hypnotic music process. Moreover, the solid architecture of the score has collected inside the diversity of microtonal manipulations from the adoration of unison and refined transitions to overall glissando forming a microdimensional result.

¹² As Horst-Peter Hesse pointed out, the experiments with specially built psalteries revealed that the $\frac{1}{12}$ -tone is the limit suitable for practical purpose (Hesse 1991: 214). Here I would add a statement by Alois Hába, who had described the $\frac{1}{12}$ -tone = 17 cents as the smallest interval in his *Neue Harmonielehre* (1927).

Conclusions

Based on the analysis of various music scores by Lithuanian authors I would note that the most common cases in Lithuanian music demonstrate the ornamentation or inflection of traditional sounds and chord harmonies, the application of transitional tones and specific treatment of glissando. Only a few Lithuanian composers may be attributed to the systematic type that characterizes the period starting from the 1990s, e.g. the sublimation of canon technique by Mažulis.

Some other authors follow a consistent path in creating rationally constructed compositions while still maintaining the energy of expression. These include Justė Janulytė, who applies the totality of glissando in her works; Vytautas Germanavičius, who recently turned towards the creation of artificial scales with microtones that are derived from Lithuanian folk music and are comparable to harmonic series; or Justina Repečkaitė, who is using microtones as derivatives from spectral scales as a means of manipulation.

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Mikrotoninė muzikos kompozicija: nuo dvylikatonio garsaeilio išplėtimo iki mikrodimensinės struktūros

Santrauka

1991 m. Douglasas Keislaris, žurnalo „Perspectives of New Music“ specialaus numerio, skirto mikrotonalumui, redaktorius ir autorius, atkreipė dėmesį, kad netradicinės temperacijos suteikia tarsi naują įkvėpimą minimalizmo raiškai muzikoje. Kita vertus, dar XX a. 7 dešimtmetyje mikrotoninio komponavimo technika skleidėsi pagrečiui su naujo skambesio ir tembrų paieškomis bei spektrinės muzikos eksperimentais. Mikrotonalumo raišką lietuvių autorių kūryboje paskutiniaisiais XX a. dešimtmečiais galima nusakyti kaip tiesioginę sąsają su pasaulyje plėtojamomis avangardo tendencijomis. Siekiant įvardyti, kuo remdamiesi Lietuvos kompozitoriai pasitelkė mikrotoninius elementus savo partitūrose, galima išskirti dvi pagrindines kryptis – tai ornamentinė / koloristinė maniera, paįvairinusi ir praturtinusi tradicinį tolygaus 12-tonio garsaeilio skambesio lauką, ir sistemiška / struktūruota kūrėjo prieiga.

Straipsnyje analizuojamos trijų lietuvių kompozitorių – Šarūno Nako, Justės Janulytės ir Ryčio Mažulio – kompozicijos, parašytos jau po 2000-ųjų ir reprezentuojančios *glissando* kaip komponavimo technikos, nulemiančios kūrinio struktūrą, atvejus. Šarūno Nako pjesėje simfoniniam orkestrui „Nude“ (2004) pasitelkiama ketvirtatoniais aukštyn ir žemyn generuojamų melodinių slinkčių logika, simetriškai formuojama apie centrinį garsą *b*. Justės Janulytės kompozicijos „Radiance“ chorui ir elektronikai (2015) atspirties tašku pasirinktas garso *a* oktavos intervalas, kuris partitūroje nuosekliai plečiamas taip „įgarsinant“ branduolinio sprogimo vaizdinį. Viename naujausių savo darbų, pjesėje „Solipse“ violončelei ir garso įrašui (2018), Rytis Mažulis pasitelkia multidimensinę prieigą, *glissando* efektą pritaikydamas įvairiems parametrams: konstruodamas 32 balsų kanoną (skamba viena violončelė gyvai bei 31 iš anksto įrašytas garso takelis) kompozitorius, pasinaudodamas skaitmenine progresija, mikroskopiniu tikslumu dalija intervalus į smulkias mikrotonines slinktis (pavyzdžiui, atstumas centais 1, 3, 6, 10, 15), atitinkamai nuosekliai yra lėtinamos tempo nuorodos (sulig kiekvienu nauju garsu tempas sulėtėja viena sekunde), kiekviena kita violončelė (iš anksto įrašytas garso takelis) įstoja viena padala / sekunde lėtesniu tempu už prieš tai buvusiąją.

PRIEDAS | SUPPLEMENT

Orientation Processes and Perspectivism in Music Analysis

Introduction

Music analysis is part of many kinds of scholarly music research. Often, it is applied without much reflection on its purpose, methods, or goals. However, analytical results are dependent on the methods and goals of analysis, and analytical methods usually serve a specific purpose. Thus, methodological reflections on choosing analytical approaches and methods are teleological activities (teleology being the explanation of phenomena in terms of the purpose they serve). This paper will specifically deal with orientation processes in music-analytical undertakings.

Today we encounter a vast array of elements to analyze that relate to music, and we also have a vast array of analytical methods. Considering elements of / related to music, perhaps we can distinguish:

- Pitch / Pitch Organization
- Scale(s) / Tonality / Modality / Atonality
- Melody / Theme(s) / Motive(s)
- Rhythm
- Harmony
- Harmonic rhythm
- Form
- Texture
- Tempo
- Time / Duration
- Articulation
- Dynamics
- Timbre / Instrumentation
- Silence
- Dramaturgy
- Tension / Energy
- Tone Production / Technique
- Other Artistic Aspects
- Pedagogical Aspects
- Creativity / Spontaneity
- Other Physical Aspects / Non-Physical Aspects
- Musical Meaning
- Musical Quotes
- Visual Elements
- Performance Venues
- Interpretation / Performance Practice
- Audience Behavior / Interaction
- Geographic Elements
- Psychological & Cognitive Aspects / Perception
- Aesthetics / Mood / Feeling
- Historical & Biographical Contexts
- Social & Cultural Contexts (e.g., purpose, intent)
- Political & Economic Contexts
- Communication Processes / Communicative Elements
- For Music with Lyrics / Words / Texts:
 - Text–Music Relationship
 - Language
 - Text Sources / Meaning / Structure
 - Story / Plot

Analytical pursuits can be undertaken to target any of these musical elements, or a combination of them. Analytical approaches or methods can target specific musical elements, or they can emphasize a particular procedure or method. Common general approaches to music analysis are:

- Focus on Specific Elements of Music
 - Harmonic Analysis of Tonal Music
 - Formal Analysis
 - Overall Form
 - Phrase–Structure Analysis
 - Rhythmic Analysis
 - Melodic / Thematic / Motivic Analysis
 - Contour Analysis
- Focus on Specific Kinds of Music
 - 12-Tone Analysis
 - Pitch–Class Set Analysis
 - Analysis of Non-Western Music
 - Electronic Music
 - Multi-Media Analysis
- General Way of Analyzing
 - Comparative Analysis
 - Descriptive Analysis
 - Computer Assisted Music Analysis (CAMA)
 - Reductive Analysis
 - Deconstruction
 - Hermeneutic Analysis
 - Cognitive Approaches to Music Analysis

The list of specific approaches and methods of music analysis is long and may include:

- Aesthetic Analysis
- Structural-Aesthetic Music Analysis (Karbusicky)
- Structuralist Music Analysis (Molino)
- Post-Structuralist Music Analysis
- Category & Feature Analysis:
 - Style Analysis (Adler, LaRue, Crocker)
 - Cantometrics (Lomax)
 - The Natural History of Song (Harvard Music Lab; S. Mehr, M. Singh, M. Glowacki)
- Motivic and / or Thematic Analysis
 - Organic Motivic Analysis / Analysis of Thematic Processes (Réti)
 - Guertin
 - Epstein (fusion with Schenkerian criteria)
- Contour Analysis (Friedmann; West Marvin & Laprade)
- Kinetic-Syntactic Analysis (Halm)
- Reductive Analysis
 - Schenkerian Analysis
 - Schenker Analysis
 - Neo-Schenkerian Analysis
 - Generative Theory of Tonal Music
 - Laske
 - Jackendoff / Lerdahl
- Analysis of Tonal Pitch Space (Lerdahl)
- Wordless Functional Analysis (Keller)
- Mathematical Analysis
 - Information Theory (Cybernetics) Analysis
 - Pitch-Class Set / Set Theory Analysis (Forte, Morris, Rahn, Morgan, Baker, etc.)
 - Klumpenhower Networks (K-nets)
 - Mazzola
- Geometrical Analysis (Tymoczko)

Transformational Theories

- Neo-Riemannian Analysis (Hyer, Mooney, Cohn)
- Transformational Theory (Lewin, Lerdahl, Hook, Kopp)
- Tonality & Transformation (Rings)

Analysis of Analytical Processes (Laske)

Tone Field Analysis (Albert Simon)

Phenomenological Analysis (Ansermet; Batstone; Pike; Clifton)

Hermeneutic Analysis

- Hermeneutic Interpretation (Kretzschmar, Goldschmidt, etc.)
- Semiotic Analysis (Tarasti; Nattiez; etc.)
- Distributional Analysis (Ruwet)

Narrative Music Analysis (Abbate, Cone, Hatten, Kivy, Almén, etc.)

Deconstruction (Street; Montgomery)

Descriptive Analysis (Tovey)

Analysis of Non-Western Music (Arom; Agawu; a variety of analytical approaches)

Analysis of Popular Music (variety of approaches)

Psychological / Cognitive Approaches to Music Analysis

- Music as Experience (Kurth, Westphal)
- Gestalt Analysis (e.g., Utriainen)
- Cognitive Theory of Musical Meaning (Meyer)
- Implication Realization (Narmour)
- Cognitive Metaphor Theory (Brower)
- Psycho-Acoustic (Parncutt)
- Cognition of Basic Musical Structures (Temperley)
- Musical Organization (Zbikowski)

Affect Analysis (Laszlo, and others)

Music Emotion Analysis (Juslin, Zbikowski, Spitzer, ...)

Schema Theory (Monelle, Gjerdingen, ...)

Analysis of Creative Processes in Music (Kinderman)

Psychoanalytical Analysis of Music

Analysis of Energy and Tension (Kurth)

Proportional Analysis of Early Music (M. Henze; Sanders; Trowell)

Analysis of Early Music (with foci on voice leading, cadence formation, modality, compositional processes, and text structure) (Leech-Wilkinson; Fuller; Judd)

Analysis of Melody and Harmony in Modern Music (Schoenberg, Hindemith)

Analysis of Form and Tonal & Harmonic Movement (Lorenz)

Theory of Musical Forces (Larsen)

Analysis of 12-Tone Music

Form in 12-Tone Music (Hyde)

Analysis of Pitch Collections / Proportional Analysis / Axis Tonality (Lendvai, Pieter van den Toorn, Antokoletz, Susanni)

Interactive Aural Analysis (Michael Clarke)

Inszenierungsanalyse von Opern (Stephanie Großmann)

Opera Analysis (Shaftel)

Analysis of Sonic Design (Cogan & Escot)

Analysis of Electronic Music (variety of approaches)

Analysis of Multi-Media (Cook)

Empirical Analysis (Deliège, Clarke, Repp, Cook, Epstein, Rink, ...)

Imaginary Museum of Musical Works (Lydia Goehr)

Analytical Segmentation

Distributional / Taxonomic Analysis (Ruwet, et al.)

Anti-Formalist Analysis (Kerman)

Analytical Approaches to Rhythm and Meter (Cohn, Forrest, Malin, Mirka, etc.)

Auditory Scene Analysis (Bregman)

Topics Analysis (Ratner, Mirka)

Empirical Analyses of Performances (Clarke; Repp; Cook)

With a great diversity of music from various periods and geographic locations, with a long list of musical elements that can be the focus of music analysis, and with a long list of music-analytical approaches and methods, I believe Werner Stegmaier's Philosophy of Orientation might help us navigate the vastness of music, musical elements, and analytical approaches, as "Orientation involves finding paths through the terrain and all the circumstances" (Stegmaier 2019: xi). I presented a more extensive version of this paper in Belgrade in 2019 (publication forthcoming); this short version provides a few key thoughts of Stegmaier's philosophy of orientation to music analysis, with added examples and with added comments on recent developments. While the general philosophical concepts related to orientation in this paper are a summary of parts of Stegmaier's Philosophy of Orientation, my own contributions here are all the music—and analysis—specific reflections and applications.

1. Stegmaier's Philosophy of Orientation

Stegmaier published his monumental *Philosophie der Orientierung* in 2008 and a shorter English version in September 2019. My quotes will all come from this latter English-language edition (Stegmaier 2019).

We require orientation, wherever we are and whatever we do. For example, if we would like to analyze a piece of music that we have never analyzed, we need to orient ourselves. But any orientation "is preceded by other orientations; orientations are always reorientations" (p. xiii). Werner Stegmaier's goal has been to investigate the conditions and structures of human orientation, and his philosophy of orientation "clarifies how individuals, despite their different orientations, are nevertheless able to find hold within their orientations, successfully communicate with each other, and at the same time, continually renew their orientations" (p. xv). But orientations may also fail and, thus, fall into disorientation, but usually, we can again re-gain orientation (p. xvi).

2. What is Orientation?

Orientation is "usually understood as an achievement in finding one's way in a new situation" (p. 1). But orientation precedes all definitions because we need to have already been oriented to define something. Orientation becomes questionable when we don't succeed, which means when we are disoriented (p. 1). This point is especially important for any research in which our goal is originality. We want to pursue a music research project that nobody else has done; we want to answer research questions that haven't been answered yet. While we use prior orientations, original research requires new or re-orientations.

Stegmaier provides a 3-step explanation: in the first step, orientation is the *achievement of finding one's way*; in the second step, orientation is the *achievement of finding one's way in order to find promising opportunities for action*; and in the third step, orientation is the *achievement of finding one's way in a situation to make out opportunities for action to master the situation* (p. 5).

3. Clues and New Situations

If orientation is initially unsuccessful, we start looking for clues (p. 6). In music research, and especially in music analysis, we may look at successful analytical studies, even if our analytical object is a different piece of music, possibly by a different composer or even from a different period or geographic region. But we then still have to find our own way and must consider our specific circumstances. We must ultimately orient ourselves on our own (p. 6).

If an orientation is preceded by another orientation, it is *temporal* (p. 8). Of course, we know this from music; music is also temporal in itself. Often, we run out of time when pursuing an analysis. I once analyzed a piece of music that was, as part of a composition competition, composed within 60 minutes, received 60 minutes of rehearsal time, and was then performed. My analysis (Schüler 2018), however, took many hours and was still incomplete. Of course, we know that there is not enough time for a "complete" musical analysis.

Stegmaier continues: "It is the *basic condition of all orientation to operate under uncertainty*. The certainties of orientation are its own certainties, which were initially acquired under the condition of uncertainty; ... It is the persistent risk of orientation that something new could always come up that is relevant and that was not seen before, and orientation consists of dealing with this risk. Orientation, as a temporary orientation, copes with its risks by relying on something only for a time or only until something else comes up" (pp. 9–10). If we orient ourselves in the music-analytical process, we rely on our previous orientations, until we encounter new music, new musical circumstances, or a new analytical approach, etc.

When we rely on previous orientations and we are certain to do the right thing, we are relying on plausibilities. “Plausibilities are assumptions that are not in need of being justified. They are, in a word, self-evident. *Every orientation relies on what it regards as plausible or self-evident*” (p. 10). Plausibilities are usually not explained; if they are explained, plausibilities become questionable (ibid.), which we can see with the current discussion on Schenkerian Analysis, especially the connection between Schenker’s known views on white racial supremacy and his theories of music. Before this issue was brought to light (in a 2019 SMT Plenary Session by Philip Ewell, published as Ewell 2021 and expanded as Ewell 2020¹), Schenkerian Analysis was a plausibility, usually unquestioned when used. And with this example, we can see that if plausibilities become questionable, *arguments* are needed to justify the plausibilities. As far as I can see, courses on Schenkerian Analysis are now being revised. “Arguments are to make something clear or explicit which was obscure or implicit. ... But what is plausible for one person may not be plausible for another; therefore, one argument may convince one person, but not another” (p. 10). If we convince ourselves or others, arguments and argumentations become or return to plausibilities (p. 11). This is exactly the case in any research, except that in research we more often than in real life make plausibilities questionable on purpose. We should explain, make explicit, our plausibilities in the music-analytical process and make them, thus, questionable; but we can’t do so endlessly (ibid.). However, plausibilities and plausibility standards in music analysis have hardly been addressed.

4. Plurality of Music Analysis

Stegmaier’s Philosophy of Orientation deals with standpoints and footholds; it allows for a variety of possibilities (pp. 12–13). Therefore, it is perfect for applying it to today’s plurality of music analysis. Plausibility is accessible through language, and the phenomenology of music analysis is complemented with a phenomenology of the language of music analysis.

Although we only require orientation when dealing with a new situation, in music analysis we practically always deal with a new situation, because we don’t always analyze the same music or the same musical elements or use the same analytical method. When we encounter or enter a music-analytical situation, “it is initially unknown what will be of concern or of interest in it” (p. 26); we must find out about it (ibid.). The “situation is not limited—neither in space nor in time” (ibid.). We may consider other elements previously not considered. That is why, in music analysis, elements such as historical, social, political, psychological, etc., may change the situation, both at the time when the piece was composed, or later when the piece was performed, or now when the piece is being analyzed. None of this information is irrelevant. What is most crucial here is that we have to consider other elements or perspectives previously not considered. My practical suggestion is, as I recently tried in my Methods and Methodology of Music Analysis course with graduate students, to go through a process of formulating research questions from various perspectives. It forces a re-orientation process and the questioning of conventions. For example, my students formulated the following questions related to harmony and melody regarding the Lied *Wenn ich in Deine Augen seh’* by Robert Schumann:

Harmony

At what point is a Roman Numeral interpretation considered “incorrect”?

Can RN analysis be used to sufficiently understand Schumann’s harmonic language in this piece?

Do you consider pivot chord modulation on V chords to be legitimate?

What are the functions of the secondary dominants within the piece?

Are there phenomenal accents using harmony specifically?

Are there modulations and, if yes, do they have a relation to a change in the composition’s accompanying text?

If there are modulations, what is the relationship between keys?

Is there a large presence of non-chord tones within the piece? Why?

What are the functions of non-chord tones in this piece?

The piano accompaniment alters its bass clef to treble frequently; why would the composer choose to have a harmony in a higher pitch than lower?

¹ The original SMT Plenary talk was indeed published later than the expanded version, because the original SMT Plenary talk was published in a print journal, while the expanded version was published in an online journal that has a faster turnaround time for publication.

What function does the harmony serve in this piece?
 Locate cadences. What functions do they have, and how do they relate to the meaning of the lyrics?
 What is the distinction between Schumann's harmonic language and CLASSICAL harmonic language?
 What is the distinction between Schumann's harmonic language and the harmonic language of some of Schumann's contemporaries?
 How do slurs affect the harmony in their role of supporting the melody?
 Why does Schumann insert different rhythms between the two clefs in a single measure?
 How are dynamics used to add to the harmony's effect on the piece?
 How does this compare to Schumann's general harmonic style?
 How does the harmony of this work compare with Schumann's writings on harmony?
 How does the harmony of this work compare with other works from the same time?
 Does each 8th note in a triplet change harmony? Why would the composer choose to change the harmonies rapidly instead of just having a note or two being non-chord tones?
 Are there prolonged harmonies using ties? Why would the composer choose to prolong it with ties instead of restating it? (ex: mm. 11–12)
 If there are tonicizations, why would the composer choose to only briefly change the key instead of changing it for a longer and more solid duration? Vice-versa.
 Is the harmony of the piece similar/different to other pieces that are contained in Op. 48?
 Which elements does this harmonic language have in common with the harmonic language of Romantic music?
 What is the relationship between harmonic language and meaning in this song?
 How independent is the harmonic language from the meaning of the lyrics?

Melody

How can we characterize the melodic design, considering the dichotomy between chromaticism and diatonicism?
 Is the melodic design regular or irregular?
 How does the melodic design relay the meaning of the text?
 What intervals are most commonly used in the melodic design?
 How does the melody relate to the harmonic progression?
 What is the standard for classifying non-chord tones?
 Are there any relations between melodic contour and text?
 Are there any relations between melodic range and text?
 Are there any relations between dynamics and melody?
 Describe the usage of the tonic in the melody and how it is both approached and departed.
 Describe the melody's contour. Why does it generally stay in the same place for a majority of the piece?
 Does this add anything to the meaning of the piece?
 Do the leaps in melody correspond to specific events/emotions in the text?
 Are there points in which the notes for the vocalist are dissonant with the piano accompaniment?
 Are there any augmented or diminished intervals within the melody? What are their functions?
 How does the vocal range for the melody compare to those in works in the same genre/time period?
 What relationship is there between melody, rhythm, and harmony?
 Which elements did Schumann compose first (in the composition process)?
 Is this melodic design particular or is it common with his other song compositions?

The possibilities of asking questions are manifold and extensive. In Stegmaier's words: "the situation of orientation can eventually be defined only negatively as that from which nothing may be excluded as irrelevant" (p. 27). In this situation, we are open to all and everything. The orientation then limits the situation that is being explored, or it may broaden or shift its focus (ibid.). "In the situation of orientation, the present consists of relevant matters from the past for the future" (ibid.). And in the situation of orientation, we can adapt to change (p. 29).

5. Contingencies

In any orientation, we deal with contingencies, which means we encounter surprises (p. 29). In music analysis, such surprises can be harmonic progressions not (or less frequently) encountered before, unusual rhythmic or formal structures, different use of motives and themes, or even an entirely different kind or style of music, etc. The list is endless. These surprises, or “irritations”, “agitations”, or “unsettlements” as Stegmaier calls them (p. 30), create the need for orientation. “Agitation or unsettlement is the basic mood of orientation” (ibid.).

6. Opportunities, Goals, Horizon, Perspectives, and Standpoints

In my methodological writings related to music analysis, I have been insisting on the importance of formulating goals and research questions before pursuing the analysis. (See, for example, Schüller 1996.) But orientation does not begin with such goals. Orientation “begins with the viewing of the situation in order to look for promising options and opportunities for action”, which Stegmaier also calls “finding meaning” (p. 36). Once we have an idea of promising options and opportunities, we formulate goals, i.e. we decide on the goals. We decide on some goals, and thus against others.

We look for an overview of the situation. When the view is unclear, we are unsettled. When the view is clear, we are calm. However, when the view is clear, we only pay attention to what is in sight. When something becomes clear to us, we lose sight of other possibilities (p. 38). Stegmaier points out another paradox: When we try to see the “bigger picture” or the big overview, we cannot focus anymore on something specific. We see everything and nothing. And when we focus on something specific, we exclude everything else (p. 39). An old saying is that we can’t see the forest because of all the trees. That is why different perspectives are necessary: different degrees of the overview (different views). We also need to do that in music analysis: we need to change perspectives; we need to change the focus, degrees, and angles at and from which we look at music. Most importantly, we will have to find the connections between those different views, perspectives, and oscillations (p. 40).

Werner Stegmaier uses the terms “horizons”, “standpoints”, and “perspectives” in his *Philosophy of Orientation* as classic terms. The “horizon”, meaning “a limiting circle”, limits an overview (p. 43). Without going into detail, the horizon helps us distinguish between center and periphery; the horizon is “a spatial boundary, but only for a certain time – it is a moving boundary. Horizon is where orientation ends; but behind every horizon, a new horizon arises” (p. 44). The “standpoint” is “the (metaphorical) ‘point’ one ‘stands’ on in a horizon and from which one sees and understands what one can see or understand within this horizon” (ibid.). We can enter or “adopt” a standpoint, but we can also leave or “abandon” it; this even allows for multiple standpoints. If we have not studied a particular music-analytical approach or methods, for example, it is outside of our horizon, and we will not be able to use it for our orientation. If all we have always done is pursue one kind of analysis, it determines our limits.

7. Scientific vs. Artistic Orientation

Stegmaier points out that science, art, and religion “create much larger leeways in the engagement with their objects” (p. 183). Science can distance itself from the everyday need of survival and can take on a “theoretical point of view”, which means that the observational standpoint may, by itself, not be part of the observed world (ibid.). Science can design theories that limit the use of signs with rules and definitions. “In contrast to science, art expands the use of signs in a way that makes it fluid; bringing about creative disorientation, it enriches human orientation through fictional orientation worlds” (p. 184). Since our scientific focus is art, music analysis should either focus on those reorientations that attractive musical works are based on, which means the creative processes, or it needs in its approaches and methods constant re-orientations to capture the artistic re-orientations. Artistic orientations and re-orientations “invent” something new. As such, it is different than everyday orientation. And in contrast to science, which limits the use of signs, art aims to constantly change signs and limits. “Art composes surprising orientation worlds” (p. 194). Therefore, music analysis must also focus on the fluidity of signs in art, must focus on the reorientations that enable the changing music worlds, and it must focus on the elements of music that change to make art surprising. Music theory that focuses on a set of rules in perpetuity will fail; it needs to focus on the *changing* of rules, on the *changing* of the musical elements, etc. And because artistic reorientations receive strong influences from the everyday world, we must also look at those elements that are less “pure” musical elements: social, political, psychological elements, etc.

Final Remarks

Many processes in pursuing music analysis require orientation:

- choosing the music (excerpts) / identifying the problem;
- formulating research questions (with target groups in mind);
- deciding on the best sources (such as scores or recordings, for example);
- choosing suitable analytical processes / approaches / methods;
- keeping in mind the balance between objectivity and subjectivity in approach / method;
- hypothesizing on analytical elements / results;
- collecting appropriate data (analytical process);
- balancing the focus on various musical elements;
- deciding on when to end data collection;
- accepting, rejecting, or modifying the hypothesis when reviewing analytical data;
- repeating previous steps if necessary;
- evaluating data / deciding on which data to use for the presentation or publication;
- deciding on presentation balance for various target groups;
- finding suitable modes of presentation (of analytical results);
- critically reviewing both, method and results;
- providing a critical outlook; etc.

The success of our music-theoretical or analytical endeavors depends on our orientation in our globalized, multi-modal, inter-disciplinary, and ever-more digitized world with a sheer vastness of kinds of music and with a sheer vastness of research methods. We will professionally only move with our time if we reflect on our current orientation skills and develop new ones (see Stegmaier 2019: xii).

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Orientacijos procesai ir perspektyvizmas muzikos analizėje

Santrauka

Muzikos teorija, kaip disciplina, tapo be galo įvairialypė, su daugybe muzikos analizės metodų. Kiekvieno tyrimo rezultatai priklauso nuo pasirinktų metodų, o pastarųjų pasirinkimas dėl jų tarpdiscipliniškumo ir diversifikacijos darosi vis labiau komplikuo- tas. Šiame straipsnyje monumntali Wernerio Stegmaierio „Orientacijos filosofija“ (Stegmaier 2008) pritaikoma orienta- cijos ir perspektyvumo procesams tyrinėti muzikos teorijos srityje (filosofas W. Stegmaieris pirmasis sistemškai ir suprantamai aptarė orientacijos sąlygas ir struktūras, įskaitant mokslines / tyrimų orientacijas). Orientacija yra būtina bet kurioje naujoje situacijoje. Orientacijos ir perspektyvos keitimo procesai tyrimuose yra būtini, tačiau pernelyg dažnai jie vyksta nesąmoningai ar netiksliai. Pirminiai orientavimosi sprendimai, pasak Stegmaierio, dažnai yra atliekami esant abejonei, spaudžiant laikui ir nulemia vėlesnius sprendimus. Jie, žinoma, apima ne tik tyrimo (analitinių) metodų pasirinkimą ir pritaikymą, bet ir muzikos pavyzdžių, ankstesnių tyrimų ir jų tāsos pasirinkimą ar tam tikrų tyrimo nišų atradimą, tyrimo hipotezių ir tikslų formulavimą, duomenų rinkimą, jų atranką ir aptarimą.

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Roger REDGATE is a composer, conductor and improviser and is Professor of Composition at Goldsmiths, University of London, where he is Director of the Contemporary Music Research Unit. He graduated at the Royal College of Music, where he won prizes for composition, violin performance, harmony and counterpoint, studying composition and conducting with Edwin Roxburgh and electronic music with Lawrence Casserley. A DAAD scholarship enabled him to study with Brian Ferneyhough and Klaus Huber in Freiburg. From 1989 to 1992 he was Northern Arts Composer Fellow, where he lectured at Durham and Newcastle Universities. He was invited as guest composer and conductor at the Darmstädter Ferienkurse für Neue Musik between 1984 and 1994 where he received the Kranichsteiner Musikpreis for composition. He is conductor and artistic director of Ensemble Exposé with whom he has recorded and broadcast for BBC Radio 3, Radio France Musique, Dutch Radio, RAI (Italy), Swedish Radio, Hessische Rundfunks and Südwestfunks and recorded many CDs including music by Paul Archbold, Brian Ferneyhough, Michael Finnissy, David Gorton and Edwin Roxburgh. He has worked in the fields of jazz, improvised music, film and television (including programmes for the BBC and Channel 4), and performance art. His compositions have been performed extensively throughout Europe, in Australia, the USA and China, and he has received commissions from the BBC, the French Ministry of Culture, Fondation Royaumont, The Darmstädter Ferienkurse für Neue Musik, The European Commission, The Huddersfield Contemporary Music Festival, the Venice Biennale and Ensemble 21 New York. He has published articles on music and culture and the music of Brian Ferneyhough and Michael Finnissy, including a chapter in the book *Uncommon Ground: The Music of Michael Finnissy*. CD recordings of his works are available on the Alma Classics, Coviello, Oboe Classics, NMC, Metier, Edition Zeitklang and Microtonal Projects labels and Single

Combat, improvisations (electric violin and turntable) with Matthew Wright, is released on Migro Records. His compositions are published by Editions Henry Lemoine, Paris and United Music Publishing Ltd.
<http://www.rogerredgate.com>
<https://soundcloud.com/roger-redgate>

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