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Sensory Manifestation: Aesthetic Presumptions of Timbre Actualization in the Second Half of the 20th Century

Abstract. Timbre stands as one of the most relevant subjects in the aesthetic and technological fields of contemporary music. The changing roles of the sonic parameters in the musical language provokes questions and considerations about the general aesthetic climate, conditioning the creative directions and results. A considerable rise of timbre as a key element in compositional organisation entails a presumption of the essential shift in the artistic mindset. The purpose of this paper is to indicate the prevailing aesthetic presumptions contributing to the emersion of timbre as the constitutive parameter in compositional practice as well as to embrace creative framework for timbre oriented music. The concepts of materialistic and sensational aesthetics serve as the ground for the consideration of timbre and create an alternative for formalistic treatment.

Keywords: timbre, formalism, materialism, sensationalism, perceptualization, contemporary music.

Timbre as a problematic concept. Identity and quality as two aspects of timbre

We can notice the abundance of miscellaneous research in respect of timbre during the second half of the 20th century and the 21st century, uncovering the phenomena in the most subtle facets. Despite great advances in the studies of timbre a certain portion of vagueness always remains unresolved. Talking about timbre, we get into the difficulties with the definition itself. The generally approved definition describes timbre as "that attribute of auditory sensation in terms of which a listener can judge that two sounds, similarly presented and having the same loudness and pitch, are different" (ANSI 1960: 45). It is not difficult to notice that this description is apparently of a negative nature, telling us more of what timbre is not than what it is. In other words, according to this definition, timbre is everything that remains within sound besides pitch, loudness and duration. Such an indetermination is stipulated by the acoustic nature of timbre so that a short discourse into the acoustic field here might be considerable. We can comprise the complexity of timbre into three main sections.

First of all, among the four main characteristics of sound (i.e., pitch, loudness, timbre, duration) timbre is exclusive for its exceptionally qualitative nature. All the aforementioned properties of sound except timbre are operable in accurate values, thus we can define pitch, duration and loudness by exactly measured quantitative values: pitch in hertz, loudness in decibels, duration in time units. Yet timbre could not be quantified by one exact measuring unit and can be characterised only by qualitative properties such as brightness, darkness, softness, harshness, etc. The second thing, which contributes to the complexity of timbre's comprehensibility, is the manifestation of multidimensional nature in the perceptual processing of timbre. A lot of recent research has shown that the sensation of timbre is determined not by one, but by a combination of different factors. Finally the totality of attributes blends into a smooth perceptual result. Research of acoustics and psychoacoustics is really advanced in determining the factors influencing the sensation of timbre, indicating both stable conditions (such as absolute frequency position of the spectral envelope or position of spectral centroid) as well as dynamic aspects (such as temporal envelope, variations of harmonic contents, onset effects and so on) contributing to the perception of timbre (Traube 2006). The third moment essential to the intricacy of the subject is the fact that timbre is purely a perceptual phenomena, which could not be found as such appearing in nature (Ambrazevičius 2012: 8). In nature we can fix only the distinct components of it, whereas human brain process all the data and join them into one integral percept. This is the moment where the acoustics passes to the psycho-acoustic area. To generalise the mentioned studies timbre appears as qualitative, multidimensional and perceptual phenomena.

Despite all the entanglements presented above we can still grasp two essential facets prevailing in the cognition of timbre and also evident in the aforementioned definition: that is the factor of identity and the qualitative factor. According to the description submitted by American National Standards Institute, timbre helps the listener to judge two sounds as different (ANSI 1960: 45), or having different sound sources (Campbell 2001). In other words, timbre could be called as an agent of identifying. Listeners can do this since experiencing the traits of inner nature constituting the sound, which is a qualitative aspect of timbre. Both aspects function as valid domains in both musical and non-musical fields. Still emphasizing one or the other side can lead to different intellectual considerations.

Speculations on timbre in musical context have always emphasized the factor of identity, associating timbre with the particular musical instrument. The experiencing of timbre is bound with the source emitting the sound according to this standpoint. It is widely discussed in the literature by such authors as Konrad Lorenz (1961), Kenneth M. Sayre (1968), Robert Erickson (1975), Wayne Slawson (1981), Denis Smalley (1994), Adrianus J. M. Houtsma (1997), Rebecca Leydon (2012), etc. According to Michel Chion, "we identify sounds as emanating from a source, whether that source be actual, inferred or imagined" (Chion 1986; Smaley 1994: 36) as in the case of electronically synthesized sounds. This is not only the most common connotation of timbre in the musical tradition, but it is a universal human ability not necessarily related to the musical field. There are interesting findings that timbre is more easily and with much less effort identifiable (even by musically uneducated people) than pitch structures such as intervals, harmonies or scales (Erickson 1975: 9–10).

On the other hand, timbre is treated not only as contributing to identifying the sound source, but also suggesting the material constitution of the source. In other words it not only designates what is emitting the sound but also what is the material quality of the sounding object (it could be illustrated by such common expressions as metallic, wooden timbre, etc.). In this sense timbre could be described as a general physiognomy of sound, as Michel Chion defines it (Chion 2011: 237). Similar ideas are transmitted also by Rebecca Leydon: "Timbre is ... a message transmitted by tangible things in the external world. The perception of timbre is the perception of resonance: it is the result of the superimposed resonant enclosures that form a sounding thing's physical structure" (Leydon 2012: 5), or as Timothy Morton puts it in musical context: "Timbre, quite simply, is the material environment as such emerging as aesthetic experience" (Morton, in Leydon 2012: 5). Therefore, in music tradition timbre has always functioned as both an identifying and a qualitative aspect.

Those two basic categories (or two aspects of timbre) – identity and quality – play a different role in diverse contexts. On the one hand, we would like to discuss how that role differs in the formalistic tendencies and the materialistic/sensational on the other, and how these diverse philosophical directions contribute to the general treatment of timbre in the context of musical composition.

Timbre in the context of the formalistic approach

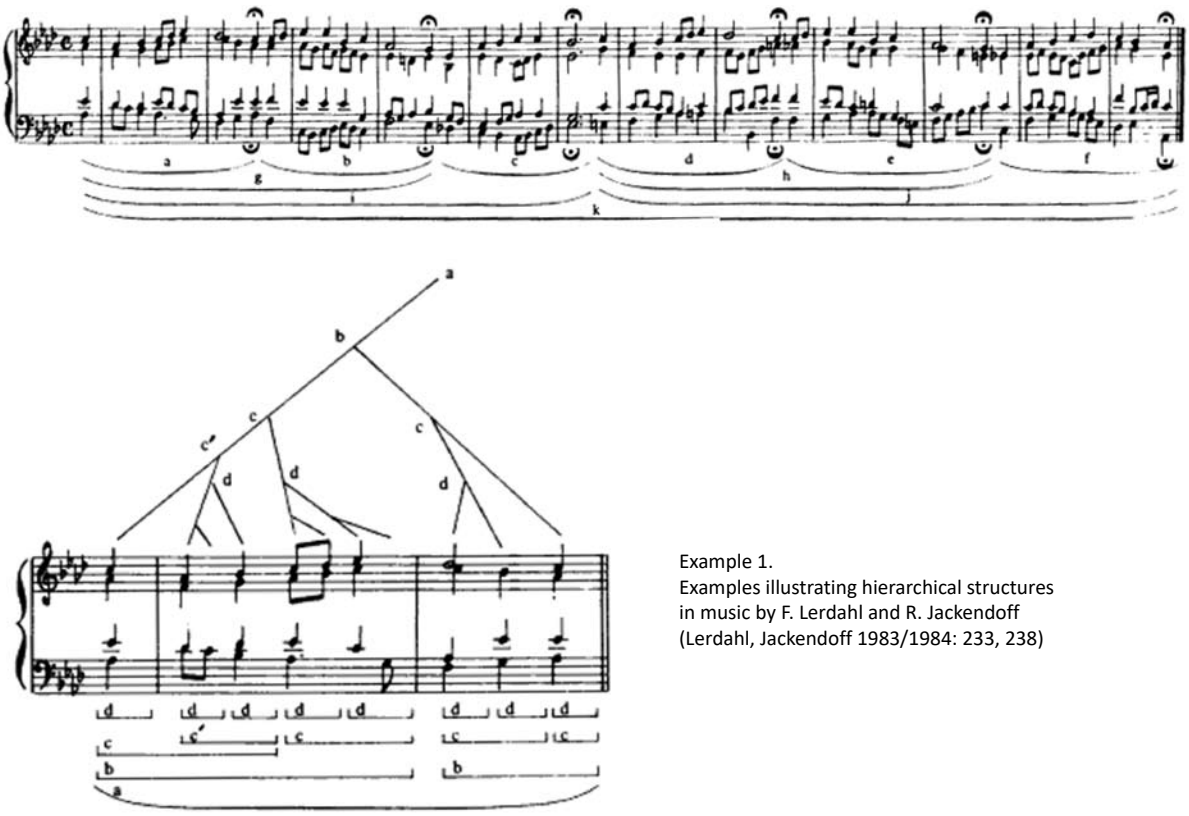
First of all we have to draw a distinction between two general philosophical directions, manifesting in the artistic activity as well: the formalistic approach and materialistic/sensational (the last two as closely related) tendency. The formalistic attitude emphasizes the priority of formal structures both as organisational factors of composition and the ordinary attributes of listening experience. Music in this regard is approached as an integral form constituted of hierarchically structured various levels (see Ex. 1). One of such representative analytical operations is to split musical unity into hierarchically interrelated structures such as motives, sentences, periods and so on.

The organisational elements are usually considered to be those parameters of pitch (melody, harmony as derivatives of it), rhythm, texture, tempo. The substantial role is yet reserved for pitch as the primal material for basic musical structures. Many theoretical authorities starting with Eduard Hanslick and ending with 20th century's music philosophers such as Roger Scruton (1997), Peter Kivy (2002), Stephen Davies (2011) and many others, state the priority of pitch.

These structures are considered to bear ontological significance as they dispose the attributes which are essential in denoting the work as particularly one but not the other. Structures formed of pitch and rhythmic patterns are the basis for identifying the work. As we could suspect, timbre does not play the essential role in this approach. As Peter Kivy stated, "rescoring works for different instruments does not always induce us to say we now no longer have 'the work', whereas changing the notes, or at least, enough of them, does drive us to that conclusion" (Kivy 2002: 217).

As we stated before, timbre has always taken a relevant place as an identity factor in music tradition. In this context it can function as an identity factor while endorsing the pitch-origin structures and helping to sustain the structural integrity. The most apparent instance is attaching one instrument (or the stable group of instruments) to the particular melody in order to maintain the melodic continuity smooth and well perceivable (Erickson 1975: 10).

Many authors (Kivy 2002; Davies 2011; Dodd 2007; Graham 2007) agree with the fact that timbre contributes to the expressive quality of the work as well, though its role is more likely subsidiary but not central. As we can notice here the identity factor is mainly reserved for pitch and rhythmic structures, whereas timbre stands as a qualitative factor, not taking an active position in the compositional organisation. As Cornelia Fales



Example 1.
Examples illustrating hierarchical structures in music by F. Lerdahl and R. Jackendoff (Lerdahl, Jackendoff 1983/1984: 233, 238)

stated: "To the general listener, pitch and loudness are variable characteristics of sound, timbre is a condition; pitch and loudness are things a sound does, timbre is what a sound is" (Fales, in Leydon 2012: 3).

We can trace such an approach in the creative practices as well. Timbre has usually been treated as an auxiliary, subordinate factor rather than actively articulated one in the compositional organisation. As a qualitative facet, it was not the substance which would be actively articulated, manipulated, standing more as enhancing other compositional parameters than prevailing them. However, the general intellectual and cultural atmosphere of the 20th century featured in diminishing the authority of formalistic/structural ideals while raising the significance of the former subsidiary area. The apparent manifestation of these processes could be the emersion of colour and light in the fine arts as the primary significance of the artistic activity. In the musical area, timbre is rising as the prominent compositional interest among most of the artists.

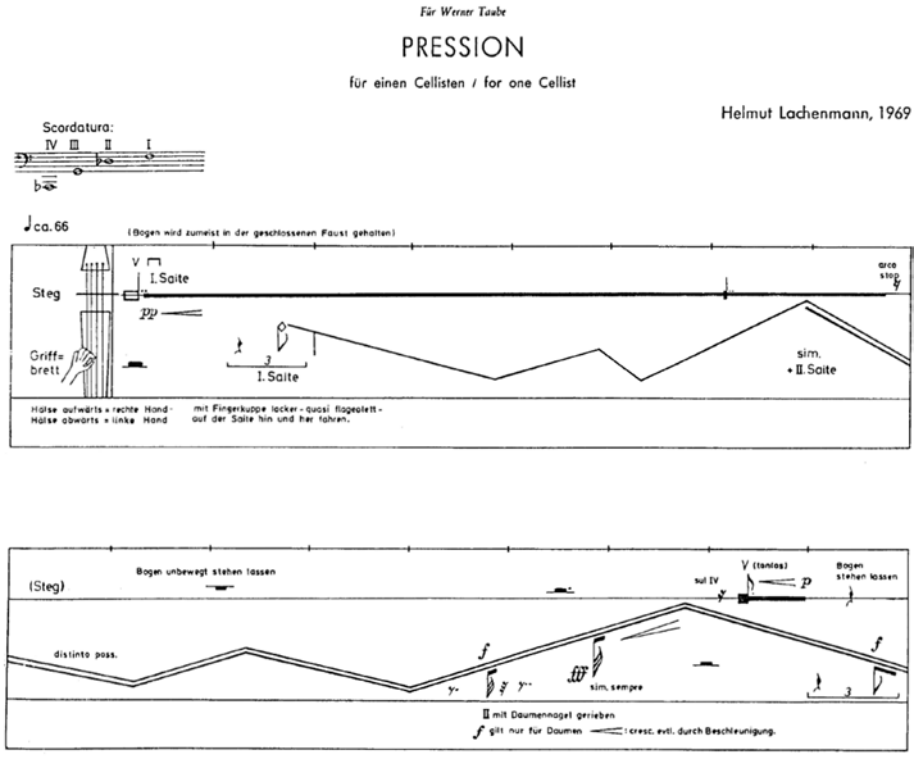
Materialism ↔ Sensationalism ↔ Perceptualization – as the aesthetic ground for actualizing timbre

As one of the main changes regarding the approach about timbre during the 20th century is the emergence of an atitude emphasizing not the attribute of identity but perceiving timbre as the sounding material which is experienced. Quality here stands as a significant factor, which links the material constitution of the sounding object and the human sensation of it. The sounding qualities instead of formal structures take the outstanding position in many composers' mind while making timbre the object of active compositional articulation. Three general trends could serve as a fertile philosophical field to substantiate the prevailing compositional ideas actualizing the potentialities of timbre: materialism, sensationalism, perceptualization.

The great figure of the 20th century's musicology associated with the materialistic philosophy is Theodor Adorno. In his texts he confronted the dominant subjectivity over the musical area and hence induced the focus on the matter itself. One of the key notions denoting his attitude is *une musique informelle*, introduced in the essay entitled *Vers une musique informelle* in 1961. As Abigail Heathcote comments, order in the pieces, according Adorno, should derive from the inner truth of the musical material, not from any superimposed, predetermined formal norms (Heathcote 2003: 35). In Adorno's words, "What is meant is a type of music which has discarded all forms which are external or abstract or which confront it in an inflexible way.

At the same time, although such music should be completely free of anything irreducibly alien to itself or superimposed on it, it should nevertheless constitute itself in an objectively compelling way, in the musical substance itself, and not in terms of external laws" (Adorno, in Heathcote 2003: 36–37).

Although a model representing such an ideal for Adorno was the atonal period of Schönberg music (Heathcote 2003: 35), it can serve as a fruitful intellectual ground for actualizing timbre in the compositional area as well. The key point of *musique informelle* is the idea that the focus deviates from the requirement to indicate the abstract structures to experiencing and opening to matter itself. In this context timbre, as a material constitution of sound, may be raised into the foreground of perceiving music. An apparent manifestation of this ideal reveals itself in Helmut Lachenmann's music. In the *Pression* written in 1969 we can no longer see any abstract forms or structures usually represented by tone pitches or rhythmic organisation. The score provides only the schematic view of the cello itself and the indications for the actions of the performer, the instructions which are no longer a visual presentation of the sonic result (see Ex. 2). Moreover, the instrument is treated not as a vehicle to render the musical structures in a conventional way, but the instrument as a whole serves as a sounding body with a multitude of possibilities for generating the sound and a source for the miscellany of timbral manipulation. Although Heathcote in her thesis draws a link exceptionally between Lachenmann's material-oriented compositional process and Adorno's materialistic philosophy, in the view of this paper's author, it could be applied more widely as encompassing timbre or sound oriented compositional practices.



Example 2. *Pression* for one Cellist by Helmut Lachenmann (page 1; 1969)

An alternative treatment of timbre could be associated with one more philosophical attitude attributable to sensationalism. The texts of Jean-François Lyotard, Roland Gérard Barthes and Gilles Deleuze exposed thus-far disregarded side of music perception, dedicating their attention to the direct sense as the foremost attribute in perceiving music. Speculating on different terms (*the grain of the voice* and *geno-singing* by Barthes, *great ephemeral skin* by Lyotard or *body without organs* by Deleuze) all of them emphasized the sensuous experience as superior to any rational or categorized cognition concerning the musical realm.

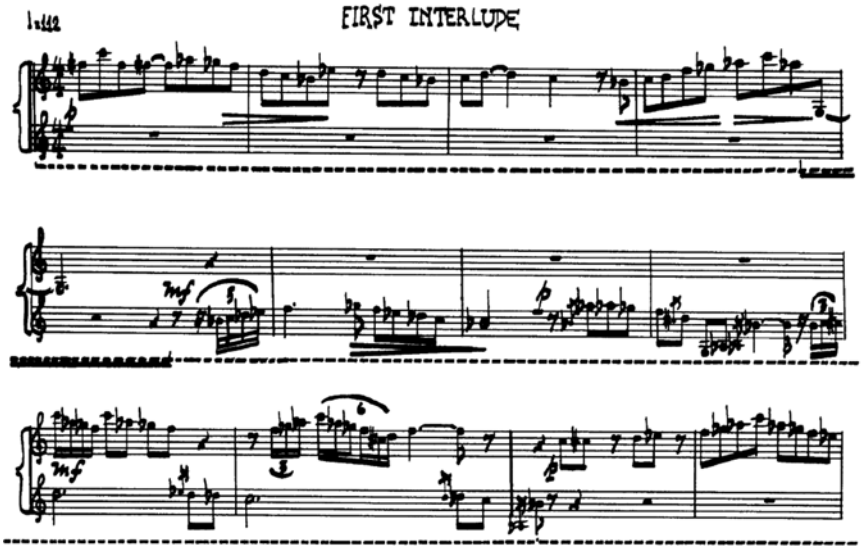
The grain of the voice, according to Barthes, is the materiality of the sounding body, "the muscles, the membranes, the cartilage", "the body in the voice as it sings, the hand as it writes, the limb as it performs" (Barthes, in Heathcote 2003: 71). Further he extends: "If I perceive the 'grain' in a piece of music and accord this 'grain'

a theoretical value (the emergence of the text in the work), I inevitably set up a new scheme of evaluation which will certainly be individual – I am determined to listen to my relation with the body of the man or woman singing or playing and that relation is erotic – but in no way 'subjective' (it is not the psychological 'subject' in me who is listening; the climactic pleasure hoped for is not going to reinforce – to express – that subject but, on the contrary, to lose it)" (Barthes, in Heathcote 2003: 72).

Lyotard's conception of *an ephemeral skin* indicates the fictional skin which is prior to all categories, identities and prior to language. Prior to any sort of representation, it communicates nothing but libidinal intensity (idem: 206). Similarly Deleuze's *body without organs* is an entity in constant flux, always in-between stable identities. It experiences not ideas, but intense affects (idem: 205).

In this context the focus moves from the compositional matter to the perception of the listener. Nevertheless the decisions of the composer may stimulate (and may be stimulated by) the sensuous processes therefore employing deliberate compositional tools. Drawing attention to the material nature of the sound source composer provokes the reaction of the human senses rather than mental response. He appeals to the senses of the listener, bypassing mind.

A sharp confrontation between mental and sensuous perception is manifest in the first interlude from *Sonatas and Interludes* of John Cage (see Ex. 3). The score provides us with clearly identifiable musical structures marked by conventional notation with exact pitches and rhythmic models. A certain fact changes the whole matter – that is the preparation of piano. By such means the physical nature of the instrument and other sounding complements come to the fore. This circumstance destroys our expectations of what we should hear, thus only direct experience can ensure the real perception of a work. The rationalist or intelligent way of listening based on mental cognition is disrupted by obscuring the accuracy of pitches and extending the timbral luxuriance. Moreover, Cage leaves freedom for the performer to treat preparation by choice so the sonic result may fully reveal itself only in the particular performance.

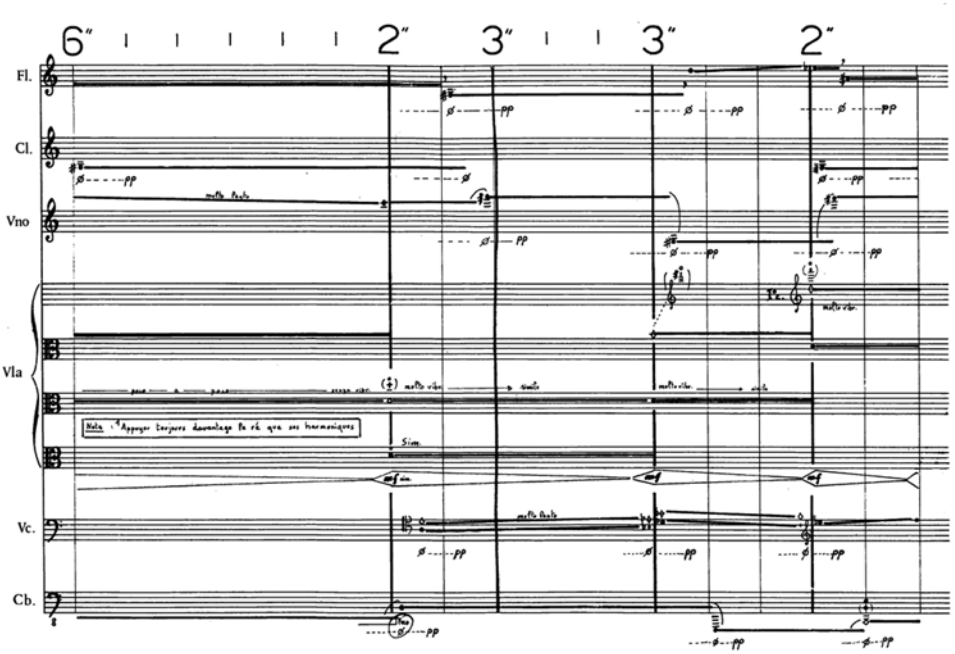


Example 3. 1st Interlude from *Sonatas and Interludes* for prepared piano by John Cage (m.m. 1–12; 1946–1948)

After emphasizing the material aspect in the musical formation and revealing the significance of physical senses in experiencing musical entity, one more matter should be stressed here. It is the human ability to process different physical senses into the one integral percept, phenomena, which could be called as perceptualization. The concept of perceptualization was introduced by ethnomusicologist Cornelia Fales, who explored the specific timbral effect in the case of Whispered Inanga practised by a Burundi ethnic group. She discovered how the manipulation of timbre could work to create "a pronounced anomaly, an auditory illusion around which performance of the music is shaped", while joining the whispering and accompaniment of the stringed instrument into one inseparable sonic result (Fales 2002: 56). As Rebecca Leydon interprets the Fales's concept – the paradox of timbre – is that timbre is at once the sound of the physical world around us and the sound of our own nervous systems.

It is a particularly intrinsic feature regarding timbre. As we mentioned before timbre itself is determined not by one, but by the totality of various factors, which are processed into integral perceptual unity. "Auditory scene analysis" by Albert Bregman means that "the various acoustic components of a given timbre, each with a certain frequency, amplitude, onset, and duration, must travel to the auditory cortex to be sorted, weighed, and assembled into an apparently unitary sensation: the timbral percept" (Bregman, in Leydon 2012: 3).

The phenomena of perceptualization has occupied a large scope of compositional activity. As French composer and philosopher Hugues Dufourt stated, "because our musical culture – which is both scientific and artistic – devises perceptual stratagems and then uses them as its basis, its defining characteristic could now be said to be *the search for sonic illusion*" (Dufourt 2010: 20). One of the most apparent manifestations regarding the creating of sonic illusions is the spectral approach in composition, aspiring "to allow the fusion of instrumental timbres (or at least a very precise control of timbres and dynamics), which was necessary in our music to build a global sound from many individual sounds" (Murail 2005/1988: 183). We see an excerpt from Gérard Grisey's *Périodes* (see Ex. 4), where he tries to "resynthesize" the timbre of trombone while "fusing" different acoustical instrumental timbres into one global timbre.



Example 4. Excerpt from *Périodes* for seven instruments by Gérard Grisey (page 3; 1974)

The actualization of timbre within compositional area in the second half of the 20th century refers to the material physique of sound, the human senses and perceptualizing processes instead of rational operations and cognition of a musical entity. Overall, we can grasp a general aspiration to reduce the weight of rational supremacy over sensual perception and let the sonic material manifest itself. By no means it indicates that rationale will be withdrawn at all. What the latest creative pursuance brought into the musical area, was the sensuous factor highly abandoned through the Western classical tradition and deeply hidden after the rational framework and external subjective categories, though the balance between rational and sensuous domains depends on the standpoint of the particular composer.

Conclusions

1. Timbre stands as one of the most explored facets of music in the second half of the 20th–21st centuries, though it still appears as an opaque phenomena. The complexity of timbre is determined by its qualitative, multidimensional and perceptual nature. However, two aspects may be discerned as predominant in defining the notion: identity and quality. As a factor of identification timbre allows to recognize the source emitting the sound, whereas qualitative aspect refers to the material constitution of the sound source. Both factors correspond to different resonances in diverse theoretical and compositional contexts.

2. A general distinction between two basic directions is evident regarding the treatment of timbre: on one side, formalistic approach takes place emphasizing the priority of formal structures both as organisational factors of composition and the ordinary attributes of listening; on the other side materialistic and sensational matters appear as significant areas in the domains of musical theory, composition and experience.

3. Formalistic approach emphasizes the priority of pitch as the main bearer of musical structures, the identification attribute of timbre meanwhile stands as an endorsing factor in sustaining the musical structures. A qualitative feature of timbre contributes to the expressive nature of the musical work, though its role appears to be subsidiary, auxiliary but not a central one.

4. A qualitative nature of timbre as the main focus reveals itself in many compositional manifestations during the 20th–21st centuries, demanding for a new theoretical framework to substantiate the artistic decisions. Three general trends are employed as a fertile theoretical ground to discuss the changing role of timbre: materialism, sensationalism, perceptualization. The materialistic approach is significant for actualizing the musical substance/material as a relevant factor functioning in confrontation with the external laws and structures imposed by composers. Timbre, as a material constitution of sound, may be raised into the foreground of perceiving the music in the materialistic approach. Sensationalism exposes the direct sense as the foremost attribute in perceiving music, resonating the perceptual facet of timbre. In respect to this position the experience of the listener comes to the fore as a substantial area of theoretical consideration. Finally, the concept of perceptualization serves as a reasonable theoretical ground examining the phenomena of timbre. Perceptualization corresponds to the multidimensional facet of timbre as an integrity of different sonic factors, which are processed to the unitary timbral percept. Spectral composers among others operate in ways of perceptualization while searching for sonic illusions realized by fusing different instrumental timbres into one global timbre.

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Pojūčio manifestacija: estetinės tembro suaktualinimo prielaidos XX amžiaus antrojoje pusėje

Santrauka

XX a. antroje pusėje–XXI a. pradžioje tembrui tampant vis svaresniu kompoziciniu komponentu daugelyje muzikos krypčių, jam įgaunant vis įvairesnių realizacijos formų, galime įžvelgti tam tikrą estetinį lūžį, peržengiantį bet kurios stilistikos ribas. Skambesio parametrų hierarchiniai pokyčiai kelia klausimų apie bendrą estetinę orientaciją, lemiančią kūrybines kryptis ir sprendimus. Tembro, kaip organizacinės reikšmės elemento, iškilimas muzikos kompozicijoje byloja apie esminius kūrybinės mąstysenos poslinkius. Straipsnio tikslas – apčiuopti šio lūžio prielaidas ir jį lėmusius faktorius. Kaip vienas pagrindinių faktorių iškeliamas kompozitorių estetinės perspektyvos posūkis prie sensualistinės kūrybinės orientacijos, išjudinęs prieš tai vis stipriau bejsigalinčias formalistines tendencijas. Materija ir jos patyrimas tampa kūrybine atspirtimi, persmelkiančia kompozicinę praktiką nuo pirminės idėjos atsiradimo etapo iki siekiamo patyriminio rezultato klausytojui. Straipsnyje išryškinti aspektai apibendrinami išvadomis:

1. Nors tembras yra vienas labiausiai tyrinėjamų muzikos aspektų XX a. antroje pusėje–XXI a. pradžioje, jis vis dar išlieka sunkiai paaiškinamu fenomenu. Šį reiškinį komplikuoja jo kokybinis, daugiadimensinis ir priklausymo išimtinai suvokimo sferai pobūdis. Vis dėlto galima išskirti du aspektus, esminius apibrėžiant tembro konceptą: tai atpažinimas ir kokybė. Kaip atpažinimo atributas tembras susijęs su garso šaltinio identifikavimu, o kokybinis jo aspektas apeliuoja į medžiaginę garso šaltinio konstituciją. Abu faktoriai kelia skirtingus rezonansus įvairiuose teoriniuose ir kompoziciniuose kontekstuose.

2. Egzistuoja ryški skirtis tarp dviejų mąstysenos krypčių, aiškinančių tembro reikšmę: 1) formalistinis požiūris, pabrėžiantis formalių struktūrų svarbą tiek kompozicinio organizavimo, tiek muzikos patyrimo sritims; 2) požiūris, pabrėžiantis medžiaginių bei patyriminių aspektų reikšmę teorinėje, kompozicinėje ar muzikos patyrimo plotmėje.

3. Formalistinis požiūris akcentuoja garso aukščių prioritetą muzikinių struktūrų darybos ir atpažinimo atžvilgiu. Identifikacinis tembro aspektas prisideda prie muzikinių struktūrų išlaikymo, sustiprinimo. Kokybinė tembro ypatybė gali suteikti išraiškingumo muzikos kūriniui, tačiau jos vaidmuo yra pagalbinis, papildomas, bet ne lemiantis.

4. Kokybinė tembro savybė – kaip centrinė – atsiskleidžia daugelyje XX a.–XXI a. kompozicinių apraiškų. Trys mąstysenos kryptys pasitelkiamos kaip teorinis laukas besikeičiančiam tembro vaidmeniui paaiškinti: materializmas, sensualizmas, perceptualizacija. Materialistinis požiūris aktualus dėl muzikinės medžiagos / materijos – kaip reikšmingo faktoriaus – iškėlimo, konfrontuojančios su kompozitorių pasitelkiamomis abstrakčiomis struktūromis. Tembras, kaip medžiaginė garso konstitucija, materialistiniu požiūriu gali būti iškeliamas į pirmą planą. Sensualizmas pabrėžia tiesioginį patyrimą kaip svarbų aspektą suvokiant muziką ir taip koreliuoja su tembro patyriminiu pobūdžiu. Šiuo požiūriu klausytojo patirtis tampa centriniu teorinių apmąstymų objektu. Galiausiai perceptualizacijos konceptas, pasiūlytas Corneliaʼos Fales, apeliuoja į daugiadimensinį tembro pobūdį ir pagrindžia garsinių iliuzijų kūrimo aspiracijas, akivaizdžias spektrinės ir kitos muzikos atvejais.