

DOI: 10.31866/2410-1176.42.2020.207638

UDC 78.02:681.841

**THE SPECIFICS  
OF CRITICAL LISTENING  
IN THE ART OF SOUND RECORDING**

Vitalii Volkomor

*Lecturer,**ORCID: 0000-0003-2401-3079,**e-mail: wolkomor2@gmail.com,**Kyiv National University of Culture and Arts,**36, Ye. Konovaltsia St., Kyiv, Ukraine, 01133*

The purpose of the article is to identify and characterise the features of critical listening as a strategy for evaluating an audio signal in the context of the art of sound recording. To provide the overall view and understanding of the research issues, the method of generalization and systematization of scientific knowledge on the phenomenon of sound in musicology was applied, as well as analytical and synthetic methods, method of musicological analysis, typological and system-structural, which have helped to organise the information, study the sound and music and the variety of elements, determine the place of critical listening in the art of sound recording, etc. The specifics of critical listening is investigated and systematic methods for identifying, evaluating and forming artistic elements of sound recording are analysed; four components of sound quality evaluation are identified and characterised – spectral content, musical context, dynamic context and dynamics in critical listening evaluation. Conclusions. The art of sound recording is implemented through the listening skills, in order to recognize nuances and create professional high-quality recordings, as well as the ability to use the recording process and technical equipment to create sound with artistic sensuality. Critical listening involves the sound quality evaluation to determine its characteristics following the context or to identify any undesired sounds or characteristics that affect the conceptualization of a piece of music as a single entity.

*Keywords:* the art of recording; critical listening; sound; sound quality; art and technical specifications

**Introduction**

Among artistic, art and technical specifications of the qualitative characteristics of sound recording, listening and critical analysis hold a special place in the art of sound recording.

Perception of sound quality and global form exist at certain levels in perspective and types of listening. These concepts are central to the evaluation process as they allow producing the sound as an object at all levels of auditory perception in details. The transmission of audio quality information is central to all aspects of music production. Almost all audio industry positions should report on the content or sound quality. However, there is no vocabulary to describe the sound quality or the evaluation process of its components. Sound quality information is usually obtained by describing the values and actions of the physical states of the timbre components. Sounds are described through the characteristics that make them single – they are actions and states that occur in the components of the timbre of the sound source.

Critical listening and technical needs of the audio industry are usually combined with creative applications and analytical process of listening. The scientific novelty lies in the fact that in this study an attempt was made to formulate these differences in addition to the perception of quality at different hierarchical levels. Investigated the specificity of critical listening and analysed systematic methods for identifying, assessing, and shaping the artistic elements of recording; identify and describe the four components of the assessment of sound quality – the spectral composition, musical context, dynamic context and dynamics in critical listening evaluation.

At the beginning of the 21st century, context research of sound recording shows that there are several trends peculiar to its development: specifics of the sociocultural space (in the context of the specific cultural and historical period), national traditions (styles peculiar to sound direction schools), individual qualities (specific creative perception of a sound by a sound producer), genre and stylistic features (the effect on a sound recording by characteristics that are unique to each of the music genres). Thus, V. Diachenko (2018) explores the creative activities of Ukrainian sound producers in the context of the development of Ukrainian culture of the second half of the 20th – beginning of the 21st century; D. Kocherzhuk (2018) covers some aspects of the influence of sound directing arts on the specifics of the pop genre; I. Gorbunova (2017) characterizes the

basic principles of the computer recording studio as a system to work with music composer, artist, and music engineer, includes a description of the mechanisms for the creation, development, preservation, dissemination and reproduction of culture as a socio-cultural work.

Analysis of the studies suggests that at the present stage the process of sound perception in the context of the art of recording requires detailed research regarding the arts.

### Purpose of the article

The purpose of the article is to identify and characterise the features of critical listening as a sound evaluation strategy in the context of the art of sound recording.

The purpose of the article requires the following objectives: to investigate the specifics of critical listening and to analyse systematic methods for identifying, evaluating and forming creative elements of the sound recording; identify and characterise four components of sound quality evaluation – spectral content, musical context, dynamic context, and dynamics of critical listening evaluation.

To review and comprehend all sides of the research issues, the method of generalization and systematization of scientific knowledge on the phenomenon of sound in musicology was used in the article, as well as analytical and synthetic methods, method of musicological analysis, typological and system-structural, which have helped to organise the information, music research in the entity and variety of elements, determining the place of critical listening in the art of recording, etc.

### Main research material

Modern Ukrainian researchers describe the sound recording as a new cultural phenomenon that influences the intensification and improvement of intercultural correlations (Diachenko, 2018, p. 2), arguing that in modern times sound production is transformed into a synthetic kind of human activity, a dualism of the arts and the tech, which is the critical characteristic of the activity.

The British scientist E. Hamilton (Hamilton, 2003, p. 345), exploring the artistic status of sound recording, points out that “recording has transformed the nature of music as art by reconfiguring the opposition between the aesthetics of perfection and imperfection”. Mechanical reproducibility, in his opinion, causes the decline of art’s aura – that numinous quality of presence which characterizes the unique, authentic artwork. Recording sacralises as well as commercialises music, and evidence for the decline of the musical aura, according to T. Adorno (Adorno, 1991, p. 35), is the “regressive listening”. An opposed view is that recordings themselves acquire an aura. I. Eisenberg (Eisenberg, 1987, p. 65) argues that the aura of music work is enhanced by recording.

According to V. Sibiriakov (Sibiriakov, 2017, p. 9), sound recording across the forms is an aesthetic interpretation, since it determines the individual outlook on the sound field, which articulates and marks a new historical period in musical art, and, as relevant, the theory of musical aesthetics.

An expanded definition of the art of recording includes those forms of music whose primary medium is the recording – in the composition and its digital developments the notion of “performance” is replaced by that of “sounding” (Hamilton, 2003, p. 362).

Sound is a common phenomenon since many listeners can be involved in the process of listening to audio material and evaluating its quality (for example, defining a musical theme, musical instrument, tempo rhythmic, dynamic, timbre and other qualities of the listening material) (Rustamov, 2013, pp. 11-12). Instead, critical listening in the contemporary art of sound recording is described by theorists and practitioners *as a strategic evaluation of the audio signal, “the creation of an individual object based on the sound (or its elements) of certain music and background material, which allows distinguishing between existing defects or undesired sound phenomena”* (Nardi, 2014, p. 16).

Critical listening incorporates elements of analysis and aims to determine the quality of sound in terms of physical presence, and then relates that information to the musical context in which the audio material is presented and perceived. It includes certain sounds and then compares the sound with others. The listener (usually an audio engineer) may be evaluating the technical quality of the sound for information related to the frequency or spectral response, as well as listening for transient response, such as focusing on the sound quality of the overall program or the particular characteristics of a single, isolated sound source.

Understanding the term of “sound quality” requires a concept statement of the “sound” as a term’s component. At present, there are several approaches in the field of phenomenology to describe the phenomenon of

sound (Casati & Dokic, 2011). In the context of this study, “sound” is interpreted as a process of wave disturbance of an elastic medium by an object that is vibrating and it causes sound perception (O’Callaghan, 2007, p. 89). Accordingly, sound as an objective process of generating mechanical vibrations in an elastic medium is related to the process of perception by its auditory system.

Sound as an entity has certain properties, such as volume and shape, noise, etc. The volume and the shape of the sound are extremely specific – the vibrations are distributed differently in space, so the projection of the sound may also be different. A. Shepshelva (Shepshelva, 2008, p. 8) states that “tightly compressing or filling the whole acoustic space, infinitely continuing or pulsing, sound, like physical bodies, seems to make a “contour” and exist as a point, a spot (dense, small-scaled, gradually emerging and rapidly disappearing), waves (motion created by a smooth transition from point to wide sound-area and return to original state), line (motion of sound-area by linear path). According to the researcher, the variety of forms of sound, which represent its ability to squeeze and grow to infinity, show great imaginative and artistic potential, which opens new outlines of its expressiveness.

In the context of this study, we consider it expedient to consider in more detail and analyse the characteristics of sound quality according to the specifics of critical listening.

*Pitch density* is the rating associated with the pitch of the sound characteristics of its qualities at the highest level of the rank structure. It can occur in a musical context or outside it. *Analysis of main tone* (for example, perfect for percussion sounds), is another characteristic quality of the sound is related to its height, but at a low hierarchical level (also not necessarily in a musical context).

Pitch density analysis contains the main tone in a musical context, but the analysis of percussion is out of it. There are given ordinary or generalised approaches to the evaluation of timbre and sound quality that state the information about the tonal component, which leads to the evaluation of timbre or sound quality. This process involves the evaluation of the spectral content of the sound. Similarly, the dynamic analysis of the contours involves the quality evaluation of sound at different structural levels.

The sound quality is recognised as the perception of sound to be a single concept or a single entity (Moylan, 2012, p. 160). The listener perceives it in a global form or in the form of multiple levels of the hierarchy of perception. The sound quality is recognised at all levels of perspective (details that are perceived).

Music of a certain type emphasises the dimensions of the overall musical texture, or sound masses, or the sound quality relationships within the overall musical texture. The concept of giving musical significance to the sound quality of the entire program, relationships of sound qualities and to pitch density can be found in a wide variety of popular musical works (e.g. “A day in the life” by The Beatles). In most cases, this concept is used in some industries. The concept of sound quality and pitch is what shapes the music, the dramatic motion of the song’s transition part and its conclusion. The sound mass concept of pitch density is the primary musical element, causing the timbre and sound quality to be the dominant artistic elements.

The sound quality is evaluated through *the spectral content, musical context, dynamic context and dynamics in critical listening evaluation*. The sound evaluation is performed at all levels of the hierarchy of perception accordingly. At the highest levels, there are individual sources of sound that make up the texture of the overall program and can be treated as individual spectral components. At the lowest level individual spectral components, as well as sound sources that can be analysed for their contribution to the sound quality of the overall program, are evaluated. In the *musical context*, this evaluation compares the sound source with their overall quality through:

- individual dynamic contours (creating a musical balance);
- main pitch areas (creating pitch density evaluation);
- spatial characteristics.

In the process of critical listening, the contribution of the individual sound sources to the overall program is analysed by the above parameters, but without relation to the musical time or context.

The audio professional usually deals with evaluating the individual sound source concerning its uniqueness. Individual sound sources are evaluated according to their unique qualities as sound objects. The sounds are evaluated to define their unique characteristics by determining the states and activities of the component parts out of the musical context. This is the most common use of sound quality evaluation that is used for many activities – from settings of the signal processors to evaluating the production of audio devices, as well as from defining the general characteristics of the sound source (for example, to a detailed evaluation of a particular guitar sound).

There are many other possibilities. Often the evaluation of the sound quality is performed on one isolated presentation of the sound sources. An isolated presentation has its own unique level of the main pitch, dynamic

level of performance, the method and intensity of articulations, etc. Studying a specific isolated presentation of the sound source allows comparing different versions of the same source or other performing similar material.

Evaluation of sound quality is aimed at determining the state and activities of the *dynamic envelope* of the source, *spectral content* and *spectral envelope*, and is also used thoroughly appreciated by the listener's perception of the *pitch definition*.

V. Molan (Moylan, 2012, p. 161) states that the quality of the sound is determined by the physical dimensions of its sources and their unique states and levels of perception by the listeners. The definition of the fundamental frequency contributes to the formulation of the information on these values, especially on the volume level of the fundamental frequency in relation to the rest of the sound spectrum, and the dominance of the harmonic partials. Four components of sound quality evaluation are explored throughout the entire time of the sound material and are depicted on a single time line. The researcher argues that the pitch definition and dynamic envelope exist in terms of the overall sound, and the spectrum and spectral envelope are the inner components of sound and are recognised at a lower level of perspective (Moylan, 2012, p. 161).

To determine the dynamic contour of the sound or the overall dynamics of its changes throughout the dynamic level is quite difficult at the first hearings. Difficulties may arise through some strange changes in volume and spectral component. According to researchers, the listener must focus on the actual volume and not to take other parameters of the sound. The reference dynamic level and dynamic contour are required, which is determined by the intensity level of the source (sound recording). The intensity level itself is the dynamic level that evaluates the sound quality. It is used at the level of the spectral envelope, respectively the same reference level operates on two levels of perspective, as well as one reference dynamic level operates as a program dynamic contour, and for musical balance. Dynamic contour describes the shape and speed of the dynamic envelope and its dynamic levels at specific points in time. By understanding how the change of volume and defining the levels and the speed of these changes, the listener describes the physical elements of sound, which affect each other. They include important components of the unique objective character of the sound.

An extremely important aspect of critical listening is *spectral content*. Harmonics and overtones fuse to the fundamental frequency, therefore, are perceived primarily as part of a whole (the global sound quality). The researchers emphasise that a major part of the evaluation of the sound quality works against all listening techniques and previous listening experiences (Moylan, 2012, p. 163). Only through practice and repeated listening, one acquires the skills of accurately recognising the spectral components and monitoring of the dynamic contours that make up the spectral component. The number of harmonics can be used to identify the spectral components. For example, the listener can imagine the harmonic series as a chord above the main part, and hearing the sound of this chord, to represent the height of the harmonic series while listening. This will contribute to better identification of the pitch/frequency of the existing harmonic series. In addition to the harmonics, it is also possible to determine the location of frequency/pitch, respectively, the listener will be able to quickly determine where harmonic series is. Thus, the harmonic series is used as a template for comparison and identification of existing frequency/pitch. This estimates the spectral content much more accessible. A tone generator or keyboard can be used to assist in determining the levels of the frequency or pitch of the main harmonics and overtones. The definition of harmonics, as well as specifying the content of overtones provides a significant amount of objective information about the sound.

Description of the entrances and exits of the partials (harmonics and overtones), as well as individual dynamic contours of these partials (spectral envelope), provides additional important information on the quality of the sound. The *spectral envelope* is defined by scientists as “a function that provides amplitude to exceed the frequency and is envelope magnitude of the short-time spectrum (STS)” (Rodet et al., 1987). The spectral envelope used for the synthesis of musical sound thanks to their operational models as the model of “source-filter”, and perception of musical sounds, such as timbre. Besides, they offer a view of important sound properties, which greatly simplifies the management of synthesis models.

J. Schwartz and K. Kind (Schwarz & Rodet, 1999) note that the spectral envelope extremely contributes to the analysis and synthesis of sound through their contact with models of production and perception, as well as its ability to grab and manipulate the important properties of sound using intuitive “musical settings”. Spectral components that are identified as spectral content, available at the level of the spectral envelope including the fundamental frequency. It is divided into the *fundamental frequency*, *subtones and subharmonics*, *overtones and harmonics* that make up the spectral content. When displaying the dynamic levels and contours of these partials important information about the definition of pitch and character of the sound is obtained. Thus, the listener gets extremely meaningful and objective information about the sound.

The ability to evaluate the sound quality and timbre is extremely important for the sound producer, recording engineer and producer, as understanding and learning these characteristics are necessary to convey accurate and up-to-date information. The skills of listening and recognising the components of the quality/timbre of the sound contribute to enhancing the artistic component of the recording.

### Conclusions

The art of recording is realised through the ability to listen to, in order to recognise the nuances and create a professional quality recording, as well as the ability to use the recording process and technical equipment to create sound with artistic sensitivity. Critical listening involves evaluation of the sound quality to define its distinctive features according to the context or to identify any undesired sounds or characteristics that affect the conceptualisation of the musical work entity.

Directions for future research involves a thorough analysis of the features of critical listening to music recordings of different genres.

### References

- Adorno, T. (1991). On the fetish character of music and the regression of listening. In J. Bernstein (Ed.), *The culture industry*. Routledge [in English].
- Casati, R., & Dokic, J. (2011). Sound. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. <https://plato.stanford.edu/search/searcher.py?query=Sound> [in English].
- Diachenko, V. V. (2018). *Tvorcha diialnist ukraïnskikh zvukorezhyserviv druhoi polovyny XX – pochatku XXI stolittia: teoriia, istoriia, praktyka [Creative activity of Ukrainian sound producers in the second half of the 20th – beginning of the 21st century: theory, history, practice]*. (Abstract of PhD Dissertation). National Academy of Managerial Staff of Culture and Arts, Kyiv [in Ukrainian].
- Eisenberg, E. (1987). *The recording angel: explorations in phonography*. McGraw-Hill [in English].
- Gorbunova, I. B. (2017). Kompiuternaia studiia zvukozapisi kak instrument muzykalnogo tvorchestva i fenomen muzykalnoi kultury [Computer recording studio as an instrument of musical creativity and the phenomenon of musical culture]. *Society: Philosophy, History, Culture*, 2, 87-92. <https://doi.org/10.24158/fik.2017.2.21> [in Russian].
- Hamilton, A. (2003). The art of recording and the aesthetics of perfection. *British Journal of Aesthetics*, 43,(4), 345-362. <https://doi: 10.1093/bjaesthetics/43.4.345> [in English].
- Kocherzhuk, D. V. (2018). Rol i znachenie razvitiia zvukozapisi v oblasti vokalno-estradnogo iskusstva [The role and importance of the development of sound recording in the field of vocal and pop art]. *Vesnik Belaruskaga dzjarzhavnaga vniversitjeta kultury i mastactvaw*, 1(29), 71-75 [in Russian].
- Moylan, W. (2012). *The Art of Recording: Understanding and Crafting the Mix*. CRC Press [in English].
- Nardi, C. (2014). Gateway of Sound: Reassessing the Role of Audio Mastering in the Art of Record Production. *Dancecult. Journal of Electronic Dance Music Culture*, 6(1), 8-25. <https://doi: 10.12801/1947-5403.2014.06.01.01> [in English].
- O'Callaghan, C. (2007). *Sound: a philosophical theory*. Oxford University Press. <https://doi: 10.1093/acprof:oso/9780199215928.001.0001> [in English].
- Rodet, X., Depalle, Ph., & Poirot, G. (1987). Speech Analysis and Synthesis Methods Based on Spectral Envelopes and Voiced/Unvoiced Functions. *European Conference on Speech Tech* [in English].
- Rustamov, A. R.-O. (2013). *Zvukovoi obraz prostranstva v strukture khudozhestvennogo iazyka zvukorezhissury [The sound image of space in the structure of the artistic language of sound engineering]*. (PhD Dissertation). St. Petersburg University of the Humanities and Social Sciences, St. Petersburg [in Russian].
- Schwarz, D., & Rodet, X. (1999). Spectral Envelope Estimation and Representation for Sound Analysis-Synthesis. *Proceedings of the ICMC* (pp. 351-354). <https://pdfs.semanticscholar.org/0f2b/ae5c813a66b44fa36fc2fb7d387d10356bb7.pdf> [in English].
- Shepsholeva, O. V. (2008). *Zvuk v khorakh a cappella otechestvennykh kompozitorov poslednei treti XX veka: sodержatelnyi aspekt [Sound in choirs a cappella of domestic composers of the last third of the 20th century: substantial aspect]*. (Abstract of PhD Dissertation). The Herzen State Pedagogical University of Russia, Astrakhan [in Russian].
- Sibiriaikov, V. N. (2017). *Zvukozapis kak forma esteticheskoi interpretatsii [Sound recording as a form of aesthetic interpretation]*. (Abstract of PhD Dissertation). Lomonosov Moscow State University, Moscow [in Russian].

*The article was received by the editorial office: 21.03.2020*

**СПЕЦИФІКА  
КРИТИЧНОГО ПРОСЛУХОВУВАННЯ  
В МИСТЕЦТВІ ЗВУКОЗАПИСУ**

Волкомор Віталій Вікторович  
*Викладач,  
Київський національний університет  
культури і мистецтв, Київ, Україна*

Мета статті – визначити і охарактеризувати особливості критичного прослуховування як стратегії оцінки звукового сигналу в контексті мистецтва звукозапису. Для всебічного розгляду та осмислення означеної проблематики застосовано метод узагальнення та систематизації наукових знань про феномен звуку в галузі музикознавства, а також аналітичний і синтетичний методи, метод музикознавчого аналізу, типологічний та системно-структурний, що посприяли систематизації інформації, дослідженню явища музичного звукозапису в єдності та багатоманітні елементів, визначенню місця критичного прослуховування в мистецтві звукозапису та ін. Наукова новизна. Досліджено специфіку критичного прослуховування та проаналізовано систематичні методи виявлення, оцінювання та формування художніх елементів звукозапису; визначено і охарактеризовано чотири компоненти оцінки якості звуку – спектральний склад, музичний контекст, динамічний контекст та динаміку критичної оцінки прослуховування. Висновки. Мистецтво звукозапису реалізується завдяки вмінню слухати, з метою розпізнавання нюансів і створення професійного якісного запису, а також вмінню використовувати процес запису та технічне обладнання для формування звуку з художньою чуттєвістю. Критичне прослуховування включає в себе оцінку якості звуку для визначення його характерних особливостей відповідно до контексту або виявлення будь-яких небажаних звуків чи характеристик, що впливають на концептуалізацію цілісності музичного твору.

*Ключові слова:* мистецтво звукозапису; критичне прослуховування; звук; якість звуку; художньо-технічні параметри

**СПЕЦИФІКА  
КРИТИЧЕСКОГО ПРОСЛУШИВАНИЯ  
В ИСКУССТВЕ ЗВУКОЗАПИСИ**

Волкомор Виталий Викторович  
*Преподаватель,  
Киевский национальный университет  
культуры и искусств, Киев, Украина*

Цель статьи – определить и охарактеризовать особенности критического прослушивания как стратегии оценки звукового сигнала в контексте искусства звукозаписи. Для всестороннего рассмотрения и осмысления обозначенной проблематики применен метод обобщения и систематизации научных знаний о феномене звука в области музыковедения, а также аналитический и синтетический методы, метод музыковедческого анализа, типологический и системно-структурный, которые помогли систематизации информации, исследованию явления музыкальной звукозаписи в единстве и многообразии элементов, определению места критического прослушивания в искусстве звукозаписи и др. Научная новизна. Исследована специфика критического прослушивания и проанализированы систематические методы выявления, оценки и формирования художественных элементов звукозаписи; определены и охарактеризованы четыре компонента оценки качества звука – спектральный состав, музыкальный контекст, динамический контекст и динамика критической оценки прослушивания. Выводы. Искусство звукозаписи реализуется благодаря умению слушать, с целью распознавания нюансов и создания профессиональной качественной записи, а также умению использовать процесс записи и техническое оборудование для формирования звука с художественной чувственностью. Критическое прослушивание включает в себя оценку качества звука для определения его характерных особенностей в соответствии с контекстом или выявления каких-либо нежелательных звуков или характеристик, влияющих на концептуализацию целостности музыкального произведения.

*Ключевые слова:* искусство звукозаписи; критическое прослушивание; звук; качество звука; художественно-технические параметры