Música Hodie | ISSN: 2317-6776 DOI: 10.5216/mh.v22.68883

The perception of vocal aesthetics in digital art

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Abstract: The active use of new digital technologies in the art of music is becoming the basis of a new aesthetic perception that has relevance nowadays. The possibilities of digital technology to transform the voices of performers make it relevant to consider the role of vocal aesthetics in digital music art. This study aims to investigate the features of vocal aesthetics perception in digital art. The perception of musical works as pleasant or unpleasant correlates with the psycho-emotional state of the listener; thus, to study the psycho-emotional impact of synthesized vocal without instrumental accompaniment, the authors used Kunin projective physiognomic test (1977), the WAM (Well-being, Activity, Mood) technique (1973), and the Wessman-Ricks self-assessment of mental state technique (2004). The study involved 182 students and teachers of Conservatory of Music, Communication University of Zhejiang, China. The study of the psycho-emotional state of respondents before and after listening to synthesized vocal compositions allowed the authors to indirectly evaluate the aesthetic perception of digital music art. After listening to the vocal digital fragment, which included both major and minor fragments of different tempo and rhythm, the overall mood in the group of respondents significantly improved: good mood was detected in 26.9% of cases, and very good - in 11.5%. The positive impact of listening to a vocal digital song on the well-being, activity, and

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mood of the respondents correlates with its positive aesthetic impact. The research confirms that aesthetic properties are directly dependent on the listener's point of view, aesthetic experience is a matter of value and emotion, and aesthetic feeling arises as a result of an unconscious process and is associated with the normalizing effect of digital vocal composition on the psycho-emotional state of the respondents. The practical significance can be presented by the further development of digital music art, considering its psycho-emotional impact on the listeners and the corresponding aesthetic perception. In further research it seems important to study the vocal component of digital music compositions, in comparison with the live voice and in combination with it. It seems promising to identify the psychological factors in the emergence of aesthetic feeling when listening to live and digital music, which will create digital music works that evoke a deeper emotional response from listeners.

Keywords: Aesthetics. Digital art. Music. Vocal. Voice.

Resumo: O uso ativo das novas tecnologias digitais na arte musical está se tornando a base de uma nova percepção estética que tem relevância na atualidade. As possibilidades da tecnologia digital de transformar as vozes dos performers tornam relevante considerar o papel da estética vocal na arte musical digital. Este estudo tem como objetivo investigar as características da percepção da estética vocal na arte digital. A percepção de obras musicais como agradáveis ou desagradáveis se correlaciona com o estado psicoemocional do ouvinte; assim, para estudar o impacto psicoemocional do vocal sintetizado sem acompanhamento instrumental, os autores usaram o teste fisionômico projetivo de Kunin (1977), a técnica WAM (Bem-estar, Atividade, Humor) (1973) e a técnica de Wessman-Ricks. avaliação da técnica do estado mental (2004). O estudo envolveu 182 alunos e professores do Conservatório de Música da Universidade de Comunicação de Zhejiang, na China. O estudo do estado psicoemocional dos entrevistados antes e depois de ouvir composições vocais sintetizadas permitiu aos autores avaliar indiretamente a percepção estética da arte musical digital. Após ouvir o fragmento digital vocal, que incluía fragmentos maiores e menores de

diferentes tempos e ritmos, o humor geral do grupo de entrevistados melhorou significativamente: bom humor foi detectado em 26,9% dos casos, e muito bom - em 11,5%. O impacto positivo de ouvir uma música digital vocal sobre o bem-estar, a atividade e o humor dos entrevistados se correlacionam com seu impacto estético positivo. A pesquisa confirma que as propriedades estéticas dependem diretamente do ponto de vista do ouvinte, a experiência estética é uma questão de valor e emoção e o sentimento estético surge como resultado de um processo inconsciente e está associado ao efeito normalizador da composição vocal digital sobre o estado psicoemocional dos entrevistados. O significado prático pode ser apresentado pelo desenvolvimento posterior da arte musical digital, levando em consideração seu impacto psicoemocional nos ouvintes e a percepção estética correspondente. Em pesquisas futuras, parece importante estudar o componente vocal de composições musicais digitais, em comparação com a voz ao vivo e em combinação com ela. Parece promissor identificar os fatores psicológicos no surgimento do sentimento estético ao ouvir música ao vivo e digital, o que criará obras de música digital que evocam uma resposta emocional mais profunda dos ouvintes.

Palavras-chave: Estética. Arte digital. Música. Vocal. Voz.

Submetido em: 10 de maio de 2021

Aceito em: 20 de dezembro de 2021

Introduction

Aesthetics reflects the sensual perception of the beautiful in art, nature, and life (ALEXANDER, 2015). Any sphere of social life can become a source of aesthetics (MELNIKOVA, 2005). The specific nature of musical art involves the peculiarities of sensation, imagination, and perception associated with the peculiarities and patterns of musical language. Sound, as a physical phenomenon, is not only perceived by the human auditory analyzer but also has an impact on the electromagnetic impulses of the brain, which determines the psychotherapeutic effect of melodies. At the turn of the 20th and 21st centuries in both academic and popular culture, the creation of music by means of electronic musical instruments and electronic technology has developed and become widespread (EMMERSON, 2017). New digital technologies in music are becoming the basis of new music aesthetics, opening up wide possibilities for the use of a variety of sounds in addition to the classical musical notation and the realization of sound synthesis by means of its graphic representation (CALDERÓN-GARRIDO *et al*., 2020). Today, digital music accompanies people everywhere, becoming an integral component of popular culture. The enormous possibilities of digital technology to transform performers' voices make it relevant to consider the role of the vocal in the digital music art. Accordingly, the study object is digital music as an aesthetic phenomenon, and the subject is the role of the vocal in the musical aesthetics of digital art.

The study aims to investigate vocal aesthetics in digital art. Research objectives are to analyze scientific literature on musical aesthetics and the vocal theme in digital art; to investigate the aesthetic perception of vocal and instrumental digital music by respondents of a randomized experimental group.

Literature Review

The human capacity for aesthetic experience as being in relation with the natural necessity of the world compels him/her to engage in the art, give form to this aesthetic experience, and care for culture as a system of value recognition (WILSON, 2020). The concepts of "vocal aesthetics" and "digital art" are connected and explained by the using of techniques and technologies of voice based on the modern technologies in order to create vocal aesthetics. Amid the dominance of simplistic ideas of right and wrong, the aesthetic mind allows connecting theoretical (scientific, philosophical), practical (political, ethical), and productive (creative, handicraft) knowledge, becoming a condition of human flourishing (WILSON, 2020). Among the current issues is the desire to understand how cultural values and the hierarchy of aesthetic judgments are formed among adults and children (NATHANIEL, 2021). Aesthetic experience is important as an emotional response to a spontaneous interpretation of an object or situation, as a symbol of the fulfilment of an impossible but inalienable desire (positive aesthetic experience) or, conversely, the inevitability of an undesirable (negative aesthetic experience) (KIRWAN, 2019). Aesthetic experience is viewed by researchers as the result of an unconscious process caused by the spontaneous interpretation of objects or situations in terms of sustained and insatiable desires arising from the conditions of existence (KRÉMER, 2020). In this case, a positive aesthetic experience evokes a desire to objectify the value of the interpreted object/situation by giving up one's role in its creation, while in a negative aesthetic experience the perceived value is within a certain object that can be avoided (KIRWAN, 2019). Aesthetic judgments have semantic meaning and properties of unity, mobility, delicacy, and tragedy. At the same time, aesthetic properties depend on points of view and contextual features of the situation (ASCHLIMAN and SCHUMMER, 2016).

It is assumed that all people possess an innate (archetypal) aesthetic urge that has a central organizing influence on actions, experiences, perceptions, self-perceptions, and attitudes. From the

perspective of aesthetic philosophy and neurobiology, experiences of depth, meaning, and transcendence belong to the realm of aesthetic experience and its interpretation (WINBORN, 2015). Three main aspects of the psychoanalytic approach are used in the study of aesthetic experience: Freud's concept of vicissitudes and sublimation; reparation, M. Klein's concept of depressive anxiety; transformation, a concept of primitive ego-states in object relations theory (SZUBIELSKA and IMBIR, 2021). The mental function of the aesthetic sense, from a psychoanalytic point of view, is to overcome the anxiety associated with the Ego, the Id, and the Superego. It consists in the transformation of experiences associated with ambiguous, opposing inner feelings within oneself caused by contact with the aesthetic object. Excessive forms of aesthetic experience can either cause feelings of awe or lead to claustrophobic anxiety, so one needs to share one's inner state, which tends to go unspoken (SZUBIELSKA and IMBIR, 2021). The question of the cognitive (similar to beliefs) or non-cognitive (similar to desires) nature of aesthetic judgments is debated (ARCHER, 2017).

It should be noted that musical culture reflects the evolution of humanity and the development of advanced technology throughout history, going from primitive bone flutes 40,000 years ago to modern electronic and digital instruments (MAGNUSSON, 2021). Moreover, recently, the study of sound, its multidimensionality and multisensory nature in its interaction with other sensory experiences, has received much more attention in the humanities (ELSEN *et al*., 2021). Sound, and especially multimedia voice, produces meaning, shapes subjectivity, and becomes part of the vast material experience of interaction (ALEXANDER, 2015; SINGH, 2021). The voice is seen as a material substance, a figure of meaningful presence, a material possibility for complex meaning-making through which one can think and reconsider the aesthetic practice of sound production in digital sphere (ALEXANDER, 2015; SINGH, 2021). Thanks to the development of information and communication technologies as a tool for cultural and

artistic production, a free artistic space is being created in which technology and art coexist and many different artistic methods are used (GELTEC, 2021).

A study of vocal attractiveness has shown that aesthetic pleasure is determined by the dynamics of acoustic signal processing on the part of the perceiver. That is, typical objects that are processed more smoothly are perceived as more attractive (BABEL and MCGUIRE, 2014). At the same time, the aesthetics of the avant-garde scene can be understood as a place of crystallization of the accompanying resistance and embodiment of an invasive but ambiguous form of ethical-moral control (BASTANI, 2021). The infrastructural politics of automated mastering shows how contemporary iterations of artificial intelligence are shaping cultural production. Artificial intelligence automates, shapes, and redefines cultural and aesthetic practices for the benefit of digital infrastructure (STERNE and RAZLOGOVA, 2021). Today, computational technology is shaping the sociocultural relationship of musicians, instrument makers, and composers with music, which becomes the result of mutual cooperation between humans and autonomous instruments based on artificial intelligence (TAHIROĞLU, 2021). Therefore, in the international art business there is an active discussion about whether machines can create real art on their own, which will turn out to be a new era and involve commercial, semantic, and aesthetic aspects (BENEDIKTER, 2021). In particular, an alternative, expanded space of light and sound is proposed as a suitable place for the intermediate practice of digital opera (VINCENT, 2018). In the realm of digital opera of the future, the role of the opera diva is also being redefined, as cyberpositive thinking becomes a source of inspiration and a catalyst for the development of new dramaturgy, composition, and performance practices (TRUBNIKOVA and TSAGAREYSHVILI, 2021). The synergy between art and science, the introduction of new ways of using the computer is seen as the only way to give music a new means of expression (HALPERN and ROGERS, 2021). Accordingly, the encounter between opera and digital media requires a new

focus on voice (TRUBNIKOVA and TSAGAREYSHVILI, 2021). Modern performance projects use various methods of spatial sound; sound technologies are conceptualized as a posthuman prosthetic extension of the body, thanks to which the audience experiences the proximity to the sound-prosthetic performer (HANELT *et al*., 2021).

Music research addresses the challenges posed by the marketplace and offers almost limitless possibilities thanks to advances in music signal (or content) analysis, which is increasingly capable of capturing the underlying musical intent in a recording (KIDD, 2021). The use of technology creates new forms of musical experience by transforming the means of accessing musical content. However, technology is not neutral, as it always brings about changes in thinking and provokes new worldviews (DEBRUYNE, 2021). Within the computational model, listener perception data are extracted and used to control the dynamic creation of real-time musical notation, resulting in structured musical notation created by a self-organizing process specified by a system interaction of independent agents, which are the computer, composer, performer, and listeners (FORNARI, 2013).

The use of various transformations of music using electronic technology makes it possible to synthesize almost any sound, as well as to use various recording instruments for musical compositions. A paradigm shift in musical creativity is taking place, creating and promoting a new musical aesthetic (CHADABE and LIMA, 2014). Besides, there has been an increase in the popularity of music that is of Islamic origin and consists only of vocals as a musical genre and mode of production, which is related both to the genealogy of music and to the aesthetics of the consumer society. The "vocal only" phenomenon is seen as part of global consumer culture, both in terms of aesthetics and its production (OTTERBECK and SKJELBO, 2020). Platforms for creating interactive and experimental computer music serve their purpose as an easy-to-use, versatile and creative tool (SCARANI *et al.*, 2020). The interaction of musicians with acoustic instruments is different

from their interaction with digital instruments, in which special methods of the creative process are used (MUDD *et al*., 2020). Further research in the field of computer music seems promising (CANAZZA and DE POLI, 2020).

Music is capable of creating associations of ideas and images. The nature of its perception is influenced by subjective, personal (life, motor and speech experience, musicality, psychophysical state) objective, musical, and dynamic (tempo, rhythm, tonality, volume, timbre characteristics of the musical work) factors. The experience of listening to music contributes to the formation of the listener axiological (value) and cognitive dispositions that determine the attitude towards the musical work (OLENSKAYA *et al*., 2015). Dynamic characteristics such as tonality, rhythm, tempo, harmony, and melody (features of the melodic line structure) determine the intonation and resonance, which are the key unique properties of a musical work, influencing personal value reconstruction. Thus, the musical influence performs a developmental function and is aimed at personal growth and self-fulfilment (GUBINA, 2013).

There are quite a few studies on digital music, but the authors were not able to find works revealing the peculiarities of aesthetic perception of vocals in digital art. Therefore, the present study tries to draw attention to this issue.

Materials and methods

Research design

The study was carried out in several stages. At the first stage, the object, subject, goals and objectives of the study were defined. The second stage - conducting an analytical review of the literature - revealed that the problem of aesthetic perception of vocals in digital art is insufficiently studied. The third stage consisted in the selection of valid psychodiagnostic methods and the formation of a randomized sample of 182 respondents from Conservatory of

Music, Communication University of Zhejiang, China. The fourth stage included psychodiagnostic study, statistical processing and analysis of the results. In the last, fifth stage, conclusions were formulated.

Sample

The research was conducted at Conservatory of Music, Communication University of Zhejiang, China, where a group of 182 respondents of different ages (average age 35) and gender-balanced composition was formed by means of randomization among students and teachers.

Using a special computer program, a vocal composition without instrumental accompaniment was synthesized with duration of 1.5 hours. This composition included fragments differing in rhythm, tempo, timbre, and tone, each of which lasted 15 minutes. Thus, the composition consisted of 6 different fragments, which, in turn, had different (excitatory or soothing) effects on the psycho-emotional state of the listeners. Before and after the listening, the respondents were offered to fill in the forms of test psychodiagnostic techniques.

Research methods

Considering the above mentioned and not being able to cover the problem comprehensively, the authors decided to study the psycho-emotional impact of synthesized vocals without instrumental accompaniment, for which they used Kunin's projective physiognomic test, the WAM test, and the Wessman-Ricks self-assessment of mental state method (PSYCHOLOGY, 2021). These techniques complement each other, allow one to conduct an express study of the psycho-emotional state of a sufficiently large group of people in the dynamics and, thus, assess the aesthetic impact of the vocal digital composition.

The Kunin Physiognomy Test was developed by American psychologists for express diagnosis of mood in a current situation. It consists of six cards on which the face of the same person in different states is depicted. The test person should pick up an image of a person in the state that best corresponds to his or her mood at that particular moment.

The WAM questionnaire is designed for rapid assessment of the psycho-emotional state at a given moment.

The self-assessment of mental state technique proposed by American psychologists A. Wessman and D. Ricks consists of the following stages. First, the indices on the scales "Calmness-Anxiety", "Energy-Fatigue", "Elevation-Depression", "Self-Confidence-Powerlessness" are determined. Then the integral index of the respondent's emotional state is calculated according to the formula: ES=(I1+I2+I3+I4)/4, where ES is the integral index of the emotional state; I1, I2, I3, I4 are individual indexes of the appropriate scales. If the ES is within the range of 8-10 points, such an emotional state is interpreted as very good; ES=6-7 points - very good, 4-5 points - worsened, and 1-3 points - bad and very bad.

Statistical processing of the data was performed using an online calculator medstatistic.ru.

Study limitations

It should be stated at once that in this work the authors faced a number of diverse limitations, related primarily to the breadth and insufficient study of research subject. Vocal in the digital art has many variants, including: digital processing of a real performer's voice; artificial voice synthesized by means of digital technologies; use of "pure" vocals without instrumental accompaniment and combination of voice and music. It is impossible to cover all of these aspects in a single article, and it is even more difficult to combine them in one particular study. Besides, as a certain limitation, the authors consider the complexity of assessing the aesthetic

perception, which itself is subjective and also includes a variety of parameters. In particular, it is the timbre, pitch and tonality of the voice, the perception of which as pleasant or unpleasant correlates with the psycho-emotional state of the listener, as well as the rhythm of the musical work. The third significant limiting aspect was the insufficient number of valid psychodiagnostic techniques aimed at studying a person's sense of aesthetics. The impact of art in its broadest sense, works of art and music, has been studied from a psychoanalytic and psychotherapeutic point of view, but the aesthetic component, although mentioned in theory, has remained unexplored.

Ethical issues

Ethical issues in the research process were resolved by ensuring the anonymity of respondents and observing the principle of informed consent. No special funding was allocated for the study, and no conflict of interest was observed.

Results

The study of the psycho-emotional state of respondents before and after listening to synthesized vocal compositions allowed indirectly assessing the aesthetic perception of digital music art. Table 1 presents the results of respondents' study with the help of Kunin physiognomic test before and after an hour and a half of listening to the vocal fragments.

Table 1 - Results of assessing the aesthetic impact of vocal digital composition using Kunin physiological test

Mood	Before listening		After listening		Student t-test	p
	N	%	n	%		
Very bad	2	1.1	-	-	14.404	<0.05
Bad	7	3.8	3	1.6		
Low	34	18.7	16	8.8		
Calm, balanced	124	68.1	93	51.1		
Good	15	18.3	49	26.9		
Very Good	-	-	21	11.5		
Total	182	100	182	100		
Correlation coefficient	0.086					>0.05

Source: survey data.

In the primary study, i.e., before listening to a digital vocal composition, 68.1% of the respondents had a calm, balanced mood, 18.3% - good mood, 18.7% - low, several respondents noted their mood as bad (3.8%) and very bad (1.1%). After listening to the vocal digital fragment, which included both major and minor fragments of different tempo and rhythm, the overall mood in the group of respondents significantly improved. No one mentioned a very bad mood, only 1.6% of respondents said their mood was bad, and 8.8% said they were in a low mood. At the same time, good mood was detected in 26.9% of cases, and 11.5% of those surveyed rated their mood after listening to a vocal digital song as very good. In 51.1% a calm, balanced mood was maintained. It is possible to assume that in the presented vocal digital composition made of fragments different in psycho-emotional influence, each of the examinees found melodies consonant to his/her actual mood, which had an appropriate positive effect. Apparently, there was an integration of individual consciousness through the characteristics and content of the perceived music, which influenced the transformation of consciousness (GUBINA, 2013) and contributed to the normalization of the psychological state of most respondents. The experiment involved universal mechanisms of symbolic transformation of consciousness (GUBINA, 2013) in the process of perception of a vocal digital composition, associated with the

content characteristics of experiences and the level of emotional tension (GUBINA, 2013). Acoustic waves organized into a musical structure affect a person's physical and psycho-emotional state and spiritual sphere (OLENSKAYA *et al*., 2015). The present study shows that artificially synthesized digital vocal composition causes a similar effect. It can be assumed that this is due to the wave nature of musical sounds, and the psycho-emotional effect depends on the parameter of these sound waves to a greater extent than on the substantive, semantic component of the composition. That is, the impact occurs predominantly not on the conscious-rational, but on the unconscious, psychophysiological level. Probably, the effect of the sound on the human body (OLENSKAYA *et al*., 2015) is a significant component of aesthetic sense formation and positive perception of the digital vocal art.

The following Table 2 shows the effect of 1.5 hours of listening to a vocal digital song on the respondents' well-being, activity, and mood.

Table 2. Effect of 1.5 hours of listening to a vocal digital song on the respondents' well-being, activity, and mood

Scale	Indices	Before listening		After listening		Student t-test	p
		n	%	n	%		
Well-being	Unsatisfactory	67	36.8	4	2.2	20.989	<0.05
	Satisfactory	104	57.1	101	55.5		
	Good	11	6.0	77	42.3		
Activity	Low	64	35.2	2	1.1	28.587	<0.05
	Medium	118	64.8	93	51.1		
	High	-	-	87	47.8		
Mood	Bad	43	23.6	19	10.4	13.602	<0.05
	Normal	139	76.4	95	52.2		
	Increased	-	-	68	37.4		
Total		182	100	182	100		
Correlation coefficient		0.421					>

Source: survey data.

If Kunin's technique is a projective express test and allows one to estimate general emotional mood, the WAM questionnaire is

a test aimed at the complex study of interconnected parameters - not only mood but also well-being and activity. The correlation of these indicators allows revealing the fatigue in a person, which is manifested by a relative decrease in well-being and activity as compared to mood (PSYCHOLOGY, 2021). This was the pattern observed during the initial study of the respondents, when 36.8% had an unsatisfactory state of well-being and 35.2% had low activity, while 76.4% of respondents assessed their mood as normal. Besides, while well-being was observed in 6.0% of the respondents, no one was found to have a high level of activity or elevated mood. Listening to a vocal digital composition contributed to the normalization of indicators on all three scales of this technique. At the same time, 47.8% of the respondents were highly active, and 37.4% rated their mood as elevated. It is possible that this effect is transient and that there will be a decrease over time. In addition, 10.4% of the respondents remained in a bad mood after listening. However, in general, the results show the positive impact of listening to a vocal digital song on the well-being, activity and mood of the respondents, which indicates its positive perception and thus indirectly proves the positive aesthetic impact. To clarify the parameters of the psycho-emotional state of the respondents, the authors used the Wessman-Ricks self-assessment technique. The integral index of the respondents' emotional state, determined with the help of this technique before and after 1.5 hours of listening to a digital vocal composition, is presented in Table 3.

Table 3. Dynamics of the integral index of the emotional state before (A) and after (B) listening to a vocal digital song

Emotional state	A		B		Student t-test	p
	n	%	n	%		
Very bad	9	4.9	-	-	15.796	<0.05
Worsened	35	19.2	2	1.1		
Good	131	72.0	106	58.2		
Very Good	7	3.8	74	40.7		
Total	182	100	182	100		
Correlation coefficient	0.400					<0.05

Source: survey data.

The dynamics of the integral index of the respondents' emotional state before and after listening to the vocal digital song positively correlated with the Kunin physiological test results and the WAM technique. At the same time, there were corresponding changes on each of the four scales that make up the integral index: "Calmness-Anxiety", "Energy-Fatigue", "Elevation-Depression", "Self-Confidence-Powerlessness". Listening to a digital vocal composition affected the psycho-emotional state of the respondents in such a way that their anxiety and fatigue decreased, and they became both calm and energetic, with increased vigor and self-confidence. Indeed, this positive impact contributed to the fact that all respondents rated the vocal digital fragment they listened to as evoking a pleasant aesthetic feeling.

Discussion

The normalizing effect of digital vocal composition on the psycho-emotional state of the respondents was perceived by them as a positive aesthetic experience, which, according to Wilson, arises as an experience of being in relation with the natural necessity of the world. Vocal art, like art in general, gives form to the aesthetic experience, which, through the aesthetic mind, connects scientific, ethical, and creative knowledge (WILSON, 2020). The present research supports the view of ASCHLIMAN and SCHUMMER (2016) that the aesthetic qualities of a work of art depend on the point of view of those who perceive it, as well as KIRWAN's (2019) assertion that aesthetic experience is a matter of value and emotion, and that aesthetic feeling arises as a result of an unconscious process and is related to the psycho-emotional impact of art.

Speaking about the comparative aspect of the development of digital vocal arts in different countries, the example of China, where university departments of vocal arts are located in buildings specially equipped for music lessons, is indicative. The classrooms have professionally adjusted acoustics and soundproofing. In

addition, multimedia classrooms and electronic music laboratories are equipped for the development of digital music art. At the same time, in Russia, there are no specially equipped classes, and lessons are held in standard classrooms, which is compensated by the presence of conditions for comprehensive musical and aesthetic development (concerts, competitions, festivals) and highly qualified teachers (JIANG, 2016a, 2016b). LOU (2018) emphasizes the need to use a systematic approach in the training of vocal students and ensure the integrity of the musical and educational process aimed at their self-fulfilment. Traditional vocal music is notable for its considerable individuality, the multiplicity of options for revealing the image and expressing the emotions and feelings inherent in the work (LOU, 2018). However, the authors of the current study did not find any studies that would confirm the identity of these characteristics in relation to digital vocals. Nevertheless, there are indications that the formation of diverse musical styles and schools is due to different understanding of the essence of the musical work (LOU, 2018), which may relate to the specificity of the digital vocal art phenomenon. Due to the peculiarities of the human vocal apparatus one can distinguish certain voice types (soprano, mezzo-soprano, tenor, baritone, bass), their more detailed variants, as well as the concept of "beauty of voice" (LOU, 2018), which is a complex characteristic of the perception of all its components. Whereas the digital art allows diversifying the vocal sound even more, combining those vocal parameters that cannot be combined in a live human voice. On the other hand, the voice synthesized with digital technology does not depend on the individual and personal characteristics of the performer, it is standard and impersonal, or universal. Theoretically, the superposition of a live voice on an artificial one helps to level out this problem to a large extent. However, the authors did not find any information in the scientific literature that would allow one to provide a convincing evidence base for this assertion. Thus, the present study is the first of its kind aimed at studying the aesthetic perception of digital vocals and their psycho-emotional impact on listeners.

Conclusions

The study of the psycho-emotional state of respondents before and after listening to synthesized vocal compositions allowed the authors to indirectly evaluate the aesthetic perception of digital music art. In the presented vocal digital composition, composed of different in psycho-emotional impact fragments, each of the subjects found melodies in tune with their current mood, which had an appropriate positive effect on their psycho-emotional state.

The influence of artificially synthesized digital vocal composition on the physical and psycho-emotional state of a person, in the authors' opinion, is associated with the wave nature of musical sounds, and the psycho-emotional effect depends on these sound waves to a greater extent than on the content and semantic component of the composition. That is, the impact occurs primarily not at the conscious-rational, but at the unconscious, psychophysiological level, which is also confirmed by scientific literature.

The study results show the normalizing effect of listening to a vocal digital song on the well-being, activity, and mood of the respondents, which indicates its positive perception and thus indirectly proves the positive aesthetic impact. After listening to the vocal digital fragment, which included both major and minor fragments of different tempo and rhythm, the overall mood in the group of respondents significantly improved: good mood was found in 26.9% of cases, and 11.5% of the surveyed estimated their mood as very good. A calm, balanced mood was maintained in 51.1%. The reduction of anxiety and fatigue, the appearance of calmness, a feeling of uplift, a burst of energy, increased vigor and self-confidence contributed to the fact that all respondents rated the vocal digital fragment they listened to as evoking a pleasant aesthetic feeling. The normalizing effect of digital vocal composition on the respondents' psycho-emotional state was perceived by them as a positive aesthetic experience, which, as evidenced by the scientific literature and the present research, is a matter of value and emotion. Whereas aesthetic feeling arises as

a result of an unconscious process and is related to the psycho-emotional impact of art.

The study can be regarded as a pilot one, focusing on the vocal component of digital music for the first time. In the future it is planned to continue this direction of research in terms of studying the aesthetic perception of digital vocal and instrumental compositions.

The practical significance can be presented by the further development of digital music art, considering its psycho-emotional impact on the listeners and the corresponding aesthetic perception. In further research it seems important to study the vocal component of digital music compositions, in comparison with the live voice and in combination with it. It seems promising to identify the psychological factors in the emergence of aesthetic feeling when listening to live and digital music, which will create digital music works that evoke a deeper emotional response from listeners. Another area of interest for international practice may be the influence of ethno-cultural characteristics on the creation of digital music and the use of vocals in it, which is also unexplored today.

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Publisher

Federal University of Goiás. School of Music and Performing Arts. Graduate Program in Music. Publication in the Portal of Periodicals UFG.