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"The Black Box" of Musical Feeling: Facts and Fiction

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Abstract. Is it necessary and is it possible to look at musical emotion from the angle of both experimental psychology and musicology? Having in mind musicological theories and experimental data the author is making a description of psychological origin and actual contents of emotional response to music as well as emotivist and cognitivist approaches to it. There are two main sources for the discourse presented here: they are experimental psychology of music and theory of music perception by Vyacheslav Medushevsky. Main candidates for the status

Translated by the author

of scientific facts are empathic nature of musical feeling as connected with imagined persona of musical narrative and communicational essence of music perception shaped by the most basic non-notational features of sound. This paper is the first out of two on the subject. The second one carrying the attempt of modeling a working pattern of music perception is planned for publication in the coming issues of the journal.

Keywords: musical communication, basic emotions, non-notational performative features of sound, empathic contents of musical emotion, emotivists and cognitivists, the imagined persona of piece and style

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Музыкальная психология

Научная статья

«Черный ящик» музыкального переживания: факты и фантазии

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Аннотация. Фокусом внимания в статье выступает возможность и актуальность совместного рассмотрения музыкальной эмоции в рамках экспериментальной психологии и музыкознания. В ходе изложения на основании имеющихся музыковедческих теорий и экспериментальных данных трактуются вопросы психологического происхождения и содержания эмоционального отклика на музыку, а также эмотивистские и когнитивистские акценты существующих психологических концепций. Научным фундаментом изложенных в статье взглядов являются, с одной стороны, данные экспериментальной психологии и, с другой стороны, теория музыкального восприятия В. В. Медушевского. В качестве претендентов на статус

научных фактов предложены такие положения, как эмпатическая природа музыкального переживания, его психологическая связь с воображаемым интонационным «героем» — персонажем музыкального повествования, а также коммуникативная природа музыкального восприятия, опирающаяся на ненотируемые (исполнительские) свойства музыкального целого. Предлагаемая статья — первая из двух, связанных общей проблематикой. Вторая будет опубликована в следующих номерах журнала.

Ключевые слова: музыкальная коммуникация, базовые эмоции, ненотируемые (исполнительские) свойства звучания, эмпатическое содержание музыкальной эмоции, эмотивисты и когнитивисты, интонационный герой стиля

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Introduction: Musicology vs Psychology

Music perception research could be called "the servant of two masters" — experimental psychology and musicology. Both of them are looking at the process of decoding musical content with their own methods from their own bell tower. Musicology is supposed to be as old as music itself in contrast to experimental psychology being rather young: only in the end of the 20th century it started to thoroughly look at musical feeling that is the most interesting subject for any layman. This change of focus is mentioned by Mark Reybrouck and Tuomas Eerola:

> Most of the efforts, up to now, have concentrated on perception and cognition, with the importance of octave equivalence and other simple pitch ratios, the categorization of discrete tone categories within the octave, the role of melodic contour, tonal hierarchies and principles of grouping and meter as possible candidate constraints. Music, however, is not merely a cognitive domain but calls forth experiential claims as well, with many connections with the psychobiology and neurophysiology of affection and emotions [1, p. 4].

Psychology of music although limited by laboratory conditions has started to consider the emotional reaction of its subjects on real music in contrast to its elements being the main research content some decades ago. It has to avoid too long parts of musical whole due to timing constraints but anyway the change is visible. In contrast to that musicology has a valid experience of considering music perception in broad cultural context as well as having in mind its complexity and subtlety. The object itself — music — is a common ground for psychology and musicology encouraging them to create a certain unity. Niels Hansen, psychologist of music, is expressing his regret on the lack of their integration, being upset by the fact that psychological discourse is not in demand by the education of musicologists and performing musicians [2, p. 598]. Federico Lauria, is supporing his views from philosophical standpoint:

> In the last decades, neuroscientific and psychological studies on musical emotions exploded [6–10]. Musical emotion is now a hot topic in psychology and neuroscience. Alas, despite the rich literature in philosophy and the empirical sciences, little attention has been paid to integrating these approaches. Philosophers have failed to consider empirical findings in detail, whereas psychologists and neuroscientists have not addressed major philosophical issues raised by affective responses to music. This review aims to redress this imbalance and establish a mutual dialogue between philosophy and the empirical sciences around the topic of musical emotions [3, p. 3].

In our context philosopher can be treated as the representative of musicological community; historians, art critics, and other scholars including musicologists are using methods of humanities being alien to experimental research based on statistical evidence.

Joint efforts of psychology and musicology are even more desirable considering the mysterious character of their object. Psychology of music is interpreting not only music perception, but also different aspects of music performance, music education, and composition. But only the listener's reaction is fairly called "the black box": in contrast to other musical activities, music perception doesn't leave any signs in the form of sounds in the air or scores on paper. Music perception is mute and closed for external surveillance remaining inside one's soul and conscience. Therefore, it's not surprising that psychology and neuropsychology of music being well developed areas of science are seeking common ground with musicology: opening "the black box" is really one of the most difficult tasks for scholarly research.

It might be desirable to integrate psychological and musicological approach to musical emotion, but different methodology of both fields of research could be an obstacle. The strong side of psychology is its experimentally confirmed evidence. Psychology of music is indeed science in the most realistic sense of the word: every hypothesis is becoming an undeniable fact with the help of statistical analysis. If it's too early to treat a hypothesis as fact, any psychologist is surely open about it declaring the difference between actual truth and supposition that needs further exploration. The strong side of musicology is its holistic approach having in mind cultural and historical details of the score, its creation

and circulation in society. Musicology and psychology also differ from one another from their textual exterior. The interpretation of a piece of music could do without too many references to the works of colleagues or any other scholars, if the score itself, supporting historical documents and author's musical experience are in action and definitely present. Experiment is an exclusively rare guest within musicological discourse.

Is it possible to harness a horse and a quivering doe to one cart? Is scholarly synthesis is going to happen relying on evidence and realism of psychological fact and at the same time subtlety and holistic view of music as cultural phenomenon that is in possession of musicology? Whether such possibility exists is a question of further investigation, but it's clear that psycho-musicological integration is up to date, and such attempts are worth trying for psychologists and musicologists as well.

Note vs Sound

Experimental research of musical emotion puts three major questions:

- are there musical universals triggering the listener's emotional feedback regardless of her origin, upbringing, and experience in that particular culture where the piece of music belongs;
- if musical universals exist what qualities of sound are responsible for major influence on human psyche;
- is it possible to confirm sustainable correlation between emotions imprinted in music and emotions aroused in a listener, in other words, could our musical response be totally arbitrary.

Being the center of psychologists' concern, these questions were discussed in lots of papers, both theoretical and experimental. Reviewing the results of his colleagues' experiments as well as his own (his Ss were to make choices among various reactions on different songs), Antonio Alaminos Fernandez

tends to confirm his peers' opinions: "There is a statistically significant empirical relationship between the musical qualities of the songs and their psychological effect as recognized by the interviewees" [4, p. 20]. Nevertheless, the author's findings are to some extent limited by the choice of Subjects and musical examples because all listeners have been Portuguese nationals totally familiar with fado genre used in the experiment. So, the author's classification of emotions naturally includes not only the most basic joy and sadness, but also more subtle categories such as "dancing, relaxing, animated, nostalgic, romantic and tense." Due to the listeners' familiarity with fado style the author's evidence looks even more convincing: "In summary, this research provides evidence for the validation of the connection between music and emotions, using empirical data through a test-retest design. It validates the importance of the musical phenomenon in the production of emotions" [4, p. 39].

If to consider basic emotions called by psychologists as "happy, sad, frightful and furious," those are universally correctly recognized regardless of one's musical background. Mafa tribe members in Northern Cameroon were excellent in defining joy, sadness, and fear in extracts of West European music; listeners from Europe didn't find any difficulties in understanding sadness, anger or joy in Indian raga, while Japanese Ss were equally successful in retrieving basic emotions from their national music as well as from Indian raga [3, p. 7]. Psychological data positions as a fact reliable connection between basic emotions and listeners' ability to read them. And more important is another fact stating the independence of this ability from one's musical background and experience.

Having said that it becomes natural to rise a question about musical "carriers" of basic emotions. Russian musicologist Vyacheslav Medushevsky is sure to consider such sound parameters as timbre, tempo, register, dynamics, accentuation, etc. as most crucial signs of expressivity in music. He calls them "the intonational form of music" that is inclined to right hemispheric localization and belongs to performer's realm. Left hemispheric localization is connected to pitch-and-rhythmic area of holistic sound impression. Pitch and rhythm structures influence our ability to memorize and recognize musical elements and themes but not so much the ability to be emotionally involved while music listening [5; 6]. There is certain piece of evidence

supporting Medushevsky's opinion when different groups of Ss, musicians and non-musicians, children and adults, were pairing as emotionally similar Western classical, jazz, and folk examples relying on non-notational features of sound [7].

The decisive role of most basic, "rough," and simple sides of music as triggers of our musical emotion was confirmed by the experiment of Patrick Juslin [8]. He has offered his Ss to listen to one and the same melody played by one and the same musician. The difference between the examples had been expressed via rough sound features when sad meant soft and slow and angry meant loud and actively accentuated. Rhythmic and pitch structures were unattended and remained the same in all renditions. The listeners had to point to basic emotions they felt in the music which they successfully managed to do.

The leading role of performance for the recognition of emotion has been confirmed again in the 21st century. The group of Canadian neuropsychologists were playing musical excerpts in mechanical and expressive regimes. The first one was played in a computer-like manner while the second one was performed by an artist-musician. The result of the experiment runs as follows:

> Expressiveness not only amplifies the intended emotion conveyed by music structure, but also makes music more engaging and more emotionally intense. Numerous anecdotal evidences suggest that music performance is the key to the expressive power of music [9, p. 653].

Isn't it possible to suppose that any music professional thinks of such findings as purely naïve? Aren't such ideas something like obvious for anyone having some musical experience? Probably yes, these are seemingly too clear from everyday point of view. But if one is on the side of scholarly discourse nothing is obvious unless it boasts experimental evidence. That was exactly the purpose of three Canadian psychologists who nevertheless were cautious to insist on the performer's tools as the carriers of musical expressivity; so, they've preferred to speak positively of such possibility but still remained on hypothetical ground. Another group of scientists turned to be more confident in the leading role of non-notational features of sound for the recognition of musical emotion. Referring to the colleague's research who

analyzed 130 publications on psychological experiments with music, the group of Swedish scholars including Patrick Juslin writes:

> ...percussive, fast tempo, highly rhythmic and loud dynamic music was found to evoke increases in heart rate and muscle tension and thus regarded as high-arousing music, whereas melodic, slow tempo, legato style and soft dynamic music was found to evoke decreases in heart rate and muscle tension, as well as increases in skin temperature and skin resistance (i.e., decreased skin conductance), and thus regarded as low arousing music [10, p. 63].

Research examples just mentioned refer to lots of analogous experiments and publications which as a whole give the possibility to treat with enough confidence the basic role of non-notational features of music, i.e., its performing parameters, in arousing our emotional response. This is a broadly recognized fact. But at the same time, it's necessary to make a statement that psychologically confirmed mechanism of emotional response to music had been predicted and theoretically validated much before it happened to become fact. The concept of intonational form of music mainly referring to non-notational side of sound had been pronounced by Vyacheslav Medushevsky in 1980. He wrote:

> If a melody is played by different instruments, in different registers, with different dynamics, articulation and phrasing, it is drastically changed in its meaning, but still remains constructively recognizable (naturally, such experiment could be undertaken not only with melody, but with the whole piece). On the contrary, if we do something totally opposite — we change pitch and rhythm, leaving untouched, for example, warm and vibrant violins' timbre, singing phrasing, middle register and moderate tempo — we preserve mild image of lyrical idiom, although the melody as such, the actual piece will be different [5, p. 86].

In other words, in the very end of the 20th century and in the beginning of the 21st psychological research confirmed the ideas that had been predicted in the role of subjective opinion or fiction much earlier. Musicologists hypothesized that musical expressivity owes its emotional power not to musical text as such but mainly to its interpretation by the performer. If a lullaby is played with articulation and accentuation of a march, it is recognized as march although it carries all pitch-

and-rhythmic signs of a lullaby. Actual intonation with its expressive impulse is being shaped by the performer. Urtext looks like a potential for her that she is free to build at her will.

Looking back, it's possible to say that the duet of two scientific fields, psychology and musicology, already exists. Musicology is formulating viable hypotheses while psychology is testing them in search of evidence. In the course of this search psychologists must not know all the details of musicological views on music perception. One doesn't need to know them when the ideas are "floating in the air": psychologists' music education and personal experience give them full access to musicological concepts, and it's not necessary to be consciously aware of the fact. Being more or less "dissolved around" musicological discourse is latently participating in psychological experimenting, even though psychologists might not refer to musicology when finally putting their results on paper.

Now it's possible to be sure that shrewd musicologists are very often right while constructing the imagined model of music perception and emotion. Psychological research is putting firm ground under these "fantasies" turning fiction into fact. Well, the answer to the first question is ready: yes, there exist musical universals that are clear to everyone regardless of upbringing and experience. Such universals refer to the ability of understanding basic emotions in music which are mostly connected to the performer's realm expressed through the formation of the roughest, non-notational features of musical whole — timbre, tempo, dynamics, register, and articulation. Their influence is undeniable and their interpretation undoubtable; there exists sustainable dependence between emotion inside music and its recognition by a listener. When identifying emotions in music we are not wandering in a random world of personal feeling, but this world is determined by the sound perceived.

Soul vs Body

The new arising question refers to the mechanism of music emotion's occurrence. It's more than possible that someone listening to sad music grows sad as well. But maybe not? Someone could just recognize sadness in music telling a sad story,

but her soul could remain untouched or touched incidentally. Are musical emotions cognitively recognized or really, even bodily induced? That was the problem for experimental research. Psychologists got interested in the structure and character of musical emotion, in its origin and subjective disposition.

The starting point for psychological research had to be its deep connection with communication that could foster musical emotion's truthful description. Ethnomusicology opened the door for looking at communication in the first place because music making in very ancient times had been a practically important process of intra-tribal communication delivering some important message to everyone. That is exactly the role of music in the days of national celebrations and troubles, when its motivating and inspiring force is in great demand.

Considering communication as one of the most vital musical functions and possibly, the most vital signaling function, psychologist Ian Cross is writing:

> …music as a communicative—prospectively, pragmatic—medium (most clearly manifested in instances of participatory music-making) implies that cognitive science and neuroscience might most fruitfully address music in the context of the exploration of the social mind and brain, and in counterpoint with explorations of other communicative channels, particularly language [11, p. 674].

In the book review released by Oxford University Press and devoted to emotion in music Dylan van der Schyff is also putting an emphasis on the process of communication as well as on its bodily expression where the reviewer strongly supports the opinion of his colleague Stephen Davies stating that musical emotion was born out of "…emotional 'contagion' or 'infection,' through physiological mimicking behavior in the listener. The approach is interesting in that it draws less on representational syntactic-linguistic aspects of musical communication and more on movement and body related characteristics" [12, p. 250].

The key word here is mimicking, copying, having its roots in Aristotle's mimesis being the clue to all arts, in this or that manner referring to reality. Psychological publications willingly use the words mimic or mimicking, when authors are describing the mechanism of music's emotional power. Involuntary bodily reaction on music stands first among the explanations:

> ...the listener perceives the emotion expressed in the music and then internally mimics the expression, which through afferent physiological feedback leads to induction of the same emotion [10, p. 75].

Federico Lauria suggests a detailed description of the process:

> Primitive contagion is the tendency to automatically mimic and synchronize with other people's facial, vocal, and bodily expressions, which results in feeling the same emotion. This process is typically unintentional, uncontrollable, and unconscious. It involves mimicry and physiological feedback. The infected subject unconsciously mimics the facial, vocal, and bodily expressions of the infectious subject's emotion (e.g., one's muscles tense and one's voice trembles in synchrony with one's friend's anxious posture and prosody). Physiological feedback from mimicry then unconsciously induces an emotional feeling in the infected subject (one feels anxious as one feels one's muscles tense) [3, p. 19].

In other words, mimesis is the translator of musical emotion. Music arises unconscious copying of intonations and movements embedded in it by parallel movements and voice reactions of the listener. These automated bodily reactions are in turn producing corresponding emotions; the process could be compared with theatrical philosophy of Vsevolod Meyerkhold, an outstanding Russian theatre director. According to his system bodily movement and gesture are the basics; they cause adequate emotional reactions mirroring bodily movements. Such understanding coincides with popular psychological approach that is confirmed in one of summarizing publications:

> Further studies show that not only does the brain interpret music through the motor systems, but it also activates a mirror neuron system which subconsciously encourages the listener to mimic the movement observed [13, p. 5].

Mark Reybrouck and Tuomas Eerola are joining Amelia Richards:

> The empirical background provides evidence from several findings such as infant-directed speech, referential emotive vocalizations and separation calls in lower mammals, the distinction between the acoustic and vehicle mode of sound perception, and the bodily and physiological reactions to the sounds. It is argued, finally, that early affective processing reflects the way emotions make our bodies feel, which in turn reflects on the emotions expressed and decoded [1, p. 1].

So to say, psychological source of musical emotion is placed into bodily mimicking, and this opinion could be declared as one of the most authoritative. But there exist some cautious voices among scholars. The group of Canadian specialists with Isabelle Peretz among them, who is one of the leading neuroscientists interested in music, is expressing doubts in the physiological origin of induced musical emotions:

> When one considers the relationship between the physiological indexes of emotional reactions and subjective feelings, very few correlations were found [9, p. 649].

Objections like that are not unique. If psychological group relying on physiological origin of musical emotion could be called emotivists, the alternative group that doesn't fully agree with them could be called cognitivists. Continuing theatrical associations, it's possible to interpret the latter group of scholars as followers of the director Konstantin Stanislavsky. He considered soul or purely psychological reaction to be the main source of our emotion, while bodily response had to be the result of internal feeling but not its trigger. Even more, cognitivists don't consider physiological reaction to music as inevitable; they'd rather call it rare and exceptional. The group of German psychologists puts it as follows:

> In this study, we investigated the capacity of music to generally induce emotions. The results presented here give further evidence for the cognitivist position, which views music as a stimulus that cannot induce, but rather can express emotions. The suggestion that musical patterns do not generally induce emotions may be contra-intuitive and must be interpreted in the context of the experimental setting [14, p. 787].

Emotivists' and cognitivists' discussion reminds of any opposition of materialistic vs idealistic origin. One party suspects real, ready to touch matter to be the core factor that causes our reaction whereas the other party is inclined towards virtual and imaginative realm. Musicology is usually out of such discussion; German cognitivists were absolutely right to rely on neuropsychological experiment as the road to the truth, and musicology doesn't have access to purely scientific instruments. Purpose and context of some psychological experiments also don't need to deeply step into emotivists vs cognitivists discussion because the origin and mechanism of the Ss' emotion is not so important as far as Kirnarskaya and Winner's experiment is concerned [7]. Its authors built their work on Vyacheslav Medushevsky's concept of "intonational form of music,"

i.e., of performer's means of influence onto the listener's reaction — non-notational rough aspects of sound such as timbre, tempo, register, dynamics, and articulation. The authors are experimenting with so called expressive ear for music concentrated on the emotional message of music as opposed to "classical" musical ear for pitch. In this context only the ability to differentiate between emotional codes of musical communication is really important, but not the origin of the Ss' emotional reaction, be it physiological or not. According to the authors' position the basis of our ability to catch the emotional message of music is relying on communication archetypes expressing the attitude of the speaking person towards the listening one [7; 15].

To finish basic emotions discourse it's possible to mention two approaches to interpreting musical emotion that could be either induced or observed. Facts are those that had been already named facts: the most basic universal emotions, accessible and recognizable by all listeners and musical equivalent of these emotions being mostly non-notational performer's means of expression.

There is one more fact to be considered in musical emotion's research, and that is its empathic nature. Practically all psychologists could agree to such statement, looking at mimicking as its psychological foundation. As the Russian poet Fyodor Tutchev used to say, "and sympathy is given to us, just as grace is given to us." Music making is communication after all, be it externally visible or internal, which means that mimicking is anyway present. Empathy could be Meyerhold-like based on bodily reactions and gestures or it could be Stanislavsky-like based on purely virtual images of our soul. In both cases we are communicating with "someone," our emotion is a footprint of connection with "someone" who is speaking to us. Vyacheslav Medushevsky included this "someone" into his theory of music perception with great confidence [6]. Thus, musicology suggests something like Ariadna's thread for future research, pointing at the most prospective developments within psychological "menu" that could shed light at the essence of music perception — the nature and core features of musical emotion.

Emotion vs Feeling

Some time ago psychologists-emotivists have built a pattern for musical equivalents to emotions where emotions were really induced by music together with their physiological signs. Musical triggers in the suggested pattern called BRECVEMA were paired with emotions they used to induce [16]. Later the more large-scale research was constructed where the Ss were relying on their introspection giving answers about their musical emotions. Eight questions put to them were the reflection of pattern that the group of Swedish scholars was going to demonstrate. Those were eight possibilities of emotionally reacting to music; the authors' explanation runs as follows:

> ...eight questions, each targeting one of the mechanisms in the BRECVEMA framework: 1) Did the music feature an event that startled you? (Brain stem reflex); 2) Did the music have a strong and captivating rhythm? (Rhythmic entrainment); 3) Did the music evoke memories of events from your life? (Episodic memory); 4) Did the music induce emotions through an association? (Evaluative conditioning); 5) Did the music evoke inner images that influenced your emotions? (Visual imagery); 6) Were you "touched" by the emotional expression of the music? (Contagion); 7) Was it difficult to guess how the music (e.g., the melody) would develop over time? (Musical expectancy); 8) Did you find the music aesthetically valuable? (Aesthetic judgment) Listeners were asked to rate each item on a scale from 0 (not at all) to 4 (a lot) [17, p. 61].

Authors' explanation and description preceded the method and results of their experiment [17, p. 57] and those explanations seemed to be a bit controversial in some points. Looking at their classification it's possible to notice the intersection of categories, a kind of fusion of them, when one is a special case of the other. Thus, paragraphs 1 and 7 relate to expectations and their violations, where paragraph 1 is a special case of paragraph 7. Paragraphs 3, 4, and 5 are also very close to each other and relate to the associations caused by music. To be more specific: the authors' remarks refer to listeners' judgement as reflecting positive or negative circumstances accompanying the previous rendition of the music (evaluative conditioning), whereas episodic memory awakes remembrances under the popular title "this is our song, darling." In such case paragraph 3 and 4 are to a certain extent intervened or blurred,

and listeners can hardly distinguish them from one another. On the other hand, some small inconsistencies cannot overshadow a very positive purpose of this research aimed at making connections between sound and emotion in the real act of listening to the real music. This is nothing but a big achievement aimed at opening up "the black box" of music perception.

In the course of this experiment rhythmic entrainment turned to be confirmed as the most important instrument challenging the listener's response. The authors have predicted exactly that result as bigger part of musical examples belonged to rhythmically charged pop-music. On the contrary, musical expectancies and their violations being a core factor for musical cognition [18; 19], as well as contagion causing mimicking and physiological reactions — both of these basic processes of human interaction with music turned to be the least mentioned by Ss in the role of emotional triggers [17, p. 72]. On one hand, this result could be the proof of the depth of these factors reflecting purely unconscious nature of music perception — it only accentuates "iceberg effect" when the listener can't really say what exactly is the lead for her emotions. On the other hand, the listeners' "forgetfulness" of expectations/violations and contagion being so vital for music perception could be the sign of too big approximation that is characteristic for BRECVEMA concept. For example, rhythmic entrainment that is so popular among the Ss, is really one of the factors included into contagion where rhythm is one of the basics. In some cases, the listeners could very well interpret contagion and rhythmic entrainment as one similar joint factor, but in other cases as two separate factors. Such confusion could dramatically bring down the role of contagion as the trigger of the Ss' emotional reaction to music. It's not surprising that the authors of this publication have in fact predicted contagion's poor role among other influential factors.

Emotivist position that treats listeners' emotion realistically as induced and physiologically visible is being criticized because emotion doesn't fit into the description of human reaction to music if it is interpreted rather strictly as a psychological term. Emotion in its core meaning is not valid for true understanding of artistic perception. If we have a look at the classical idea of emotion it reveals such components as:

> (a) a subjective experience (e.g., seeing a dog that is perceived as "dangerous"); (b) a physiological reaction (e.g., fear, manifested by increased heart rate and general sympathetic activation); (c) overt expression of the physiological state

(raised eyebrows and wide-open eyes); (d) a behavioral response (a chosen strategy to cope with the situation, such as a decision to freeze or flee) [20, p. 10].

Aleksey Nikolsky having musicological background and being a working psychologist reminds of psychological parameters of emotion that can be understood as an obstacle against emotion's inclusion into human response to music. He argues that it's better to replace the term "emotion" by another one — "feeling." From the author's point of view feeling as opposed to emotion is neither obligatory nor automatic: it is free, showing arbitrary and non-algorithmic character in its connection with different sound parameters: in some cases, they cause and, in some cases, they don't cause one's emotional reaction — listener's personality and the environment have their word here [20, p. 9]. If we imagine some supposed structural pattern or model of music perception, the interconnections of all its levels and components could be possibly not too definite and admitting mobility. These connections could be interpreted as tendencies and vectors, directed from sound to person, to her cognitive and subconscious reactions in their entirety. Any hypothetical model of perception, if and when it could be constructed, would be neither strictly deterministic nor automatic, which remains a constitutive element for emotion in its classical meaning.

The group of German scientists, already mentioned, are inclined to cognitivism and strongly doubt the reality of emotions induced by music. Here is what they say:

> Most of the affective events we found in the second-per-second condition were subjective feeling reactions without a significant physiological arousal or motor reaction. According to Scherer's component process model, these reactions cannot be considered to be real emotions. Nevertheless, most participants do react in some affective way, which can also be shown by the overall ratings. However, if this reaction is not an emotion, what could it be called? [14, p. 787].

In a way this cognitivist group is in the same section with Aleksey Nikolsky and their suggestion is to replace the term "emotion" by the term "being moved." The listeners feel the emotion, encoded in music, but indirectly, without automatic and physiological reaction to it.

In the course of musical emotion's investigation Greek psychologists happened to notice a strongly pronounced positive correlation between the Ss' ability to emotionally respond to music, on one hand, and their ability to recognize emotions in visual images of human faces and pictures, on the other hand. They argued that the effect they've found owes its origin to the unity of brain mechanisms that are in charge of both processes, aural and visual alike [21, p. 10]. Nevertheless, they were not too optimistic about the possibility of full understanding musical emotions' psychological essence because "at the present stage, the unresolved questions clearly outnumber the satisfying answers, as such providing an attractive young field for interdisciplinary research" [21, p. 25].

Cognitivists and emotivists both agree on the empathy being the core response within musical emotion. It has to be "co-feeling" in its psychological contents that is pushing forward another question: who is it or what is it that is the purpose of such empathy? Here the main focus moves towards communication through sound; some scholars openly stress the presence of the encoded "other" who is the imagined persona addressing us from inside the music [19; 6; 22; 20; 23; 24]. Here are some opinions supporting the argument:

> In this view, contagion bears important similarities with emotions felt in response to fiction (like when we feel sad for Anna Karenina). Both involve the imagination of personae and empathetic feelings [3, p. 16].

> Instead of actual persons and emotions, perhaps we should consider imagined ones. In the case of works generating fictional worlds, such as novels and films, we engage imaginatively with characters inhabiting those worlds. Maybe music's expressiveness connects to fictional or make-believe experiences of emotion [25, p. 24].

> Many musicians would agree that the meaning of a work of music is to create a "virtual person" as a protagonist in some "virtual reality" designated by "virtual time" (evident in rhythm, meter, tempo, articulation, and form) in conjunction with "virtual space" — a subjective impression from musical movement (interaction of rhythm, meter, tempo and articulation with melody, harmony and texture)... [20, p. 5].

In other words, any communication act, whether musical or not, is something like confirmation of the main character's confession from Andrey Tarkovsky's film Solaris: "human needs [only] human." Any communication act without the difference between modalities is interiorized by a human being as a sign of someone's presence, as someone's address to be decoded considering its emotional essence. Vyacheslav Medushevsky has been among the first to suggest the notion of "intonational character of style" (or of a piece). His idea is dealing with an imagined persona whom he included into the theory of music perception. Medushevsky's motto has been repeated many times in his writings about music looking at us "from inside the persona" and translating her musical message for the listeners [6].

"Co-feeling" with the intonational character or, better to say, "affect attunement" towards the imagined persona [23, p. 212] is creating the context of music perception as aesthetic and artistic. According to classical theory of aesthetics its key feature is being disinterested. But in spite of that this emotion is empathic. It's possible to come to a conclusion that artistic and aesthetic emotion does not suppose or even excludes direct emotion in its basic meaning. It's possible to compare this feeling to childish make-believe: any child listening to fairy tale is simultaneously believing and not believing into the events presented to her. She interprets these events as something that could have happened but did not happen anyway. Here we come across the difference between actual truth and imagined credibility that human cognition is sure to differentiate. In arts and music everything is happening within make-believe response that practically excludes really induced emotions. Many actors mentioned in their memoirs that they probably were unable to repeat or to really feel their characters' emotions according to the script; in that case they could die on the spot that fortunately didn't happen. Although any actor in the role of Othello is to strangle Desdemona, we all know that the two of them are going to appear bowing to the audience before the curtain. Thus, the arts create parallel imagined world which makes real emotions totally irrelevant just because they are "too real," i.e., not at all disinterested.

If irrelevance of musical emotions as real emotions could be experimentally confirmed, does it mean that emotivists are in a way defeated? Is it possible to insist that physiological response to music expressed through chills and tears is either

great exception or big exaggeration? Mostly not, it's hardly possible to deny the emotions' induction in music perception. Professional musicians as well as music lovers have personal experiences of that sort, which makes the negative attitude towards induced emotions very doubtful. Authors of popular books interpreting scholarly research carry stories about instinctive singing along and moving along the perceived music [25; 26]. Even though music could be very far from the realm of melody, our voice chords demonstrate tension due to "singing" together with music. Muscles imitate dancing while listening to any music, even to the one that could be far from marching or waltzing thus demonstrating unconscious rhythmic entrainment.

As opposed to other arts where we are mostly witnesses, music turns us into "co-performers," since we are co-singing and co-dancing with it. Of course, such intimate reaction to sound is absolutely capable of inducing some physiological response; we are very deeply involved into music being its co-performers. This kind of increased activity of music perception dates back to its very ancient roots, when passive listening didn't exist — everyone sang and danced, everyone participated in music making. Isn't it partial explanation of enormous popularity of music at all times? In this context music is not sophisticated Bach-Mahler-Schoenberg, but accessible art for everyone that is inseparable from the audience's interest and involvement. Let's consider co-performing position of listeners as something like peace-making platform between emotivists and cognitivists: musical feelings are more imagined than real — they are reflections of our empathy towards "intonational character," towards the feelings of imagined persona, but our response can include physiological reactions induced by music.

As was mentioned, the concept of imagined persona or "intonational character" looks like attractive and convincing hypothesis waiting to be turned into fact; at the moment it is still fiction suggested by philosophers and musicologists. Future experiments might change the status of this idea. Nevertheless, it is possible to conclude with facts that constitute psychological responses to music; those remain facts regardless of arguments that inevitably accompany scholarly discourse.

- empathic, co-feeling contents of musical emotion;
- the leading role of non-notational performing parameters of sound (timbre, tempo, register, dynamics, articulation) creating musical emotion;

- listener's mimicking of musical emotion;
- imagined persona's inclusion in the process of music perception, interpreting such persona as the participant in communication leading musical narrative;
- physiological reactions, such as chill, tears, increased heart rate, change of skin temperature, etc. can occur while listening to the music being induced emotions in the role of bodily response to sound.

Musicological participation in scientific debate on musical emotion can be also considered as fact. Hypotheses often run ahead of facts, sometimes directing research or correcting it. All information treated as fact or being the first in becoming fact in the nearest future is inspired by or based on musicological discourse. It can be not so scientific, sometimes looking like pure fiction, but experimental psychology of music could hardly exist without it. At least we could suppose that metaphysical "fantasies" — philosophy and musicology — make "the black box" of music perception not so black.

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