



The Process of Human Speech and of Human Music

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Abstract

Considering the experimental data of sound, it is shown that the existence of human speech and of the musical culture refer to the feeling-effect of human, discovered by Pythagoras.

Keywords: Time; Hearing; Sound; Feeling-Effect; Human Speech; Music; Numerical Quantity

Introduction

Lee Smolin emphasized in his book "The Trouble with Physics" that the main unsolved problem of physics is the phenomenon "time" [1]. This specific view was recently eliminated by the paper of Dorda [2], showing that the pendulum effect, considered together with the effect of the third law of Kepler, yields the solution of this fundamental physical problem. It is obtained by using a dual system, instead of the system of units meter-kilogram-second-ampere (MKSA) given by a novel system, named "dynamics and statics" [2]. Based on this novel system, in the following paper the existence of a causal connection between the novel physical representation of the world and the human related form of being is shown [3]. This exclusive observation was ascertained by the in the third paper [4] presented finding of the specific human-related time, showing that this human time is not identical to the so-called scientific, i.e. wave-related time, representing frequency, but it is given by a specific human related difference to this scientific time, caused by the so-called localization. Yet all these findings have not been helpful to describe the experimental data of the sound of Fletcher and Munson [5,6]. Really, the exploration of the human thinking has pointed out that, beside the physical effects of the MKSA or dual system of units, the effects of the human feeling must be considered for the analysis of the existence of sound, taking into account the Feeling-Effect

of Pythagoras [4], an effect, which was already observed in the fifth century B.C. . Based on this fundamental finding, it will be documented by the experimental data of Fletcher and Munson that the Feeling-Effect of Pythagoras appears to be the main functional background of the existence of human speech as well as of human music.

The Existence of an Independence between Frequency and Time

The experimental data of Fletcher and Munson show [5,6] that the investigation of the dependence of the frequencies of sound on their intensity, i.e. on their energy, discloses a minimum of energy at the frequency of about $f_0 = 600$ Hz. Based on the relation between frequency f_y and time t_y , given by $f_y t_y = 1$, this limit frequency $f_0 = 600$ Hz yields a limit time of about $t_0 = 1.7 \times 10^{-3}$ s. Furthermore, the data of Fletcher and Munson show that the value of the intensity of sound I_y , i.e. of the sound energy E_y at the unchanged loudness below about $f_0 = 600$ Hz strongly increases with sinking frequency. This specific finding suggests that the limit of time $t_0 = 1.7 \times 10^{-3}$ s appears to be a generally effective limit of time at the dynamics of being, what supports the model of the wave related structure of the sound and which, moreover, suggest that it can be valued to be an analogy of electromagnetic dynamics [4].

Furthermore, the experimental data of *Fletcher and Munson* also disclose [5,6] that the value of the given frequency f_y is independent of loudness, i.e. of the energy, at the whole observable field of frequencies. This observation is inconsistent with all other general data of physics, thus suggesting that neither human speech, nor music, which both are related to the unit “frequency”, can be effected by the sum and/or the multiplication of another frequency, i.e. the given frequencies of speech and/or music stay fixed with time. This experimental finding shows that the existence of human words, i.e. the speech, and singing, i.e. music, is related *solely* to the effect of the unit “frequency”.

Seen in this connection, it is evident that the possibility of the musical form “canon” appears to be definite a proof of the correctness of the in this paper presented description of the structure of sound. The form of the canon, which is already many centuries old, used in music cultures and which shows no dependence of the heard presented tones on any possible sum and/or multiplication of the presented tones, can be explained neither on the basis of the classical MKSA unit system, neither by the modern dual system, nor on the basis of the quantum-mechanical theory, nor by any exclusive using of the entropy relation. This on experience-based finding appears to be a highly important fact, as it discloses a quite new view on the essence of human speech and of music.

Considering the experimental data of *Fletcher and Munson*, the detailed analysis shows that human speaking and singing must be a mental processing of by the ear absorbed signals of frequencies f_y . It is evident that according to the MKSA system of units the frequencies can be characterized by the related values of time, given by the equation $f_y t_y = 1$. But these given times t_y do not correspond with the in this connection given *human* lapse of time. This finding suggests that we have to consider the existence of two different categories of time, reflecting on the one side the dual system and thus also the meter-kilogram-second-ampere system of units (MKSA), and on the other side the data of the effects of the loudness of sounds [5,6]. Considering this important question of the existence of two quite different categories of “time”, it can be shown that the *Feeling-Effect of Pythagoras* yields the possibility to solve this fundamental problem of physics and thus also of the human being. Seen in this connection, it is legitimate to propose that the speech of human and therefore also music are an expression of free thinking, i.e. of the free mind of the human. This signifies that these facts are a result of the *Feeling-Effect of Pythagoras*, related to the mind of the *single* human. Therefore, it is allowed to disclose this on experimental data of *Fletcher and Munson* -based model by a specific statement asserting that speaking and singing of the human do not reflect any existing physical theory of the MKSA or of the dual system of units. To

be able to confirm this statement, it is necessary to comment upon the background of the *Feeling-Effect of Pythagoras*.

The Feeling-Effect – being the Background of Human Speech and Human Music

The *Feeling-Effect* is based on the experimental discoveries in the field of sound, which were observed in the fifth century B.C. and which were ascribed to the mathematician and philosopher *Pythagoras*. This fundamental observation shows that when using a string with constant stress and investigating the tones at different lengths of the string, then only in the case of the double length (named octave) – compared to its fundamental tone – creates the *feeling* of a special i.e. *agreeable* tone. This specific tone was *many centuries later* found to be describable by a *doubled frequency*. This fundamental finding in the field of the human feeling resulted in a wide-spread development of the musical culture, which reflects the human desire for feeling-effects.

From the physical point of view, this discovery has been realized by a scientific law which signifies the existence of a causal connection between the category *length*, being the localizer, and the *natural number*. The discovery of the existence of natural numbers in the being has been confirmed lastly by the observation of the Integral and Fractional Quantum-Hall-Effect (QHE), named also *Klitzing Effect* [7,8], disclosing unexpectedly also the causal connection of the QHE to the laws of the so-called harmony of music. Moreover, as has been already shown, the existence of natural numbers comes to light when we consider the human aspect of feeling. Evidently, it shows that the importance of natural numbers is manifested not only in the field of physics and thus by the MKSA or dual system of units, but also in connection with the existence of humans, as demonstrated by the *Feeling-Effect of Pythagoras*. The analysis of these effects shows that the worked-up signals of hearing are based on the *freely mental* processing in the brain of the considered single human. This shows that these processes of feeling cannot be described on the basis of *all* known physical laws, i.e. neither by the laws of the classical physics based on the MKSA or dual system of units, nor by the laws of the quantum mechanics, and also not by means of the entropy relation. Nevertheless, in agreement with many musicians and composers, these effects have to be considered to be a quite new processing of sound, referring to a particular presentation of music, or to composers of the so-called inspired music, in which the existence of the meta-physical state is recognizable.

To be able to elucidate the essence of the *Feeling-Effect of Pythagoras*, it is necessary to describe the connection of this effect to the human feeling. This connection becomes evident when we consider that the *Feeling-Effect* in music refers to two quite different experimental findings:

1) The music works, presented by singing and/or by strings, are realized solely on the basis of the process of the human hearing, which refers to the process of the described human feeling effect. In contrast to this, the musical works, presented by e.g. organs, pianos and many other mechanical instruments, are realized by sound frequencies, given by artificial, i.e. by mathematically fixed values of frequencies, obtained *inside* of any by the *Pythagoras* law given octave. The difference between these two methods of presentation of music discloses the known, far-reaching observation that the music, given by the singing and/or by strings is felt by the human to be much “purer”, considering in comparison to the music, given by the so-called mechanical musical instruments.

Moreover, to detect the dominance of the human *Feeling-Effect*, it must be taken into account that according to this model the feeling of the agreeable tones of octaves appears to be *independent in the number of octaves*, i.e. independent of the cumulative state of the octaves. Said in other words, this new proposed model shows that the sound is by the human differed only by feeling, thus realizing in the given sound the existence either of the ascending or the descending state. Thus, in the case of the connection of the ascending fourth octave together with the fifth and sixth octave we have the feeling of the so-called *major* chord, resulting in the *feeling of pleasure and joy*. In contrast to this, the feeling, realized by the descending of the fourth octave together with the fifth and sixth octave, represents the *minor* chord, yielding a feeling, which is generally felt by humanity as a tonal representation of the *feeling of sorrow and hopelessness*. It is evident that this model clearly shows that the described *Feeling-Effect* of sound is unequivocally related to the law of the octave effect of *Pythagoras*.

2) Beside to this fundamental observation of the effects of sound, it should be pointed out that the Integral and the Fractional Quantum Hall Effect (QHE) [7,8] shows, unexpectedly, some physical similarities to the sound effect. So, the quantum states are the background of both these phenomena. Furthermore, but much more interesting is the observation of the zero resistivity, i.e. the $R_{\text{QHE}} = 0$ ohm effect, given as at the integral, as well as the fractional quantum Hall Effect.

It is evident that this exclusive $R_{\text{QHE}} = 0$ ohm effect represents the existence of a state, given by the independence on the length – mass – time – ampere units, i.e. the MKSA unit system, thus representing the existence of the already by the musicians assumed meta-physical state.

Evidently, these fundamental novel findings demonstrate that really a causal connection between the QHE and the physical description of sound is given. This observation

allows to realize that the human related “feeling” appears to be the decisive factor of the existence of musical cultures. Additionally, as has been comprehensively disclosed in chapter 2, because the basis and thus the functional background is for both human speech and human music identical, thus, it is allowed to maintain the statement that the functional background of the human speech appears also to be the *Feeling-Effect of Pythagoras*. This means that the effect of feeling, being in accordance with the meaning of the hearing human, will be transformed by the process of thinking into a “personal speech”, with the possibility to mediate its content by the corresponding personal structures of the sound. Thereby, the existence of the human ability to remember the multifarious structures of sound is essential. Seen in this connection, a great help yields the writing, and lately also with the computer, which have achieved a great importance due to the use of the mathematical binary system of numbers. This shows that all findings and statements of the human, which have been observed on the basis of the *Feeling-Effect*, can be mediated solely by *structures of numbers*, what demonstrates to be the modern consequence of the observation of the existence of natural numbers, an observation, which de facto again refers to the observation of the law of the *Feeling-Effect of Pythagoras*.

Summary

Based on the experimental data of *Fletcher and Munson*, describing the dependence of the sound on its loudness, i.e. on its energy, it is shown that the given frequencies of human speech and of human music are not influenced by the sum and/or by the multiplication of further frequencies [5,6]. This signifies that the structure of frequencies of human speech or music, when once realized, remains *unchanged* at the lapse of time. It is evident that this specific effect of sound does absolutely not refer to the background of the theory of Quantum Mechanics, as well as also of the entropy function. In contrast, as has been shown in detail, the existence of the human speech and human music refers to the specific observation that the background of the sound related effect appears to be the possible existence of fixed structures of frequencies of sound. These fixed structures of frequencies are mentally worked up by the human hearing process of the ears. The analysis of this specific effect, which is the basis of human communication, has shown that this effect reflects the *Feeling-Effect of Pythagoras*. This finding demonstrates that the communicator between the human is not the category time of the MKSA system of units, for which – as all experimental data show – the existence of only *one* direction, named “living time” [3], is characteristic. Thus, the real communicator between humans appears to be the effect of feeling, which realizes two directions by the so-called *Feeling Effect*, on the one side given by the positive direction (describable as an altruistic event), and on the other side by

the negative direction (describable as an egoistic behavior), both being a result of the free human decision, thus showing the feeling of joy or sorrow. All these observations demonstrate that neither the meter-kilogram-second-ampere system, nor the modern dual “dynamics-statics” system of units can be the decisive factor of human speech and human music. But, according to the predication of the experimental data, it becomes known that these particular processes of hearing refer to the till now unexplored field of *meta-physical* effects. Thus, in addition, it should be pointed out that this new, meta-physics related model reveals in the real being no loss of quality in speech and music with changes in loudness, even when using modern technics such as radios, TVs or cell phones. Really, the common feature of radios, TVs or cell phones to realize the *absolute independence* of the by speech or music mediated sound structures in their loudness, manifests the correctness of the in this paper disclosed specific property of *sound*, i.e. of the human ears. Therefore, as a consequence of the presented analysis, it is scientifically allowed to assert the existence of meta-physical effects, thus *resulting in the dominance of the free will, i.e. the free decision of the single human*.

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