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**RETUNING THE UNIVERSE: EXAMINING THE COSMIC
SIGNIFICANCE OF SOUND FREQUENCIES, MUSIC AND HUMAN
PERCEPTION**

ABSTRACT

The article discusses the relationship between sound frequencies, music, and human perception, focusing on the debate surrounding the tuning standard used in music. The paper begins by questioning the metaphysical and religious implications of sound as a creative force. It then delves into the physics of music and human hearing and continues emphasizing the role of frequencies in shaping tonality and timbre. The significance and effects of different tuning standards, particularly comparing 432Hz tuning to the more commonly used 440Hz standard, have also been reviewed. Additionally, the historical context and potential motives behind the adoption of the 440Hz tuning standard, suggesting military and commercial interests, have been investigated. By examining these aspects, the article aims to deepen our understanding of the effects of different musical tunings on human well-being and perception, calling for further research. Ultimately, the article serves as a call to action for further research in the field.

Keywords: frequencies, retuning, music, 432 Hz, 440 Hz, human perception.

EVRENİ YENİDEN AYARLAMAK: SES FREKANSLARININ, MÜZİĞİN VE İNSAN ALGISININ KOZMİK ÖNEMİNİN İNCELENMESİ

ÖZ

Makale, müzikte kullanılan akort standardını çevreleyen tartışmalara odaklanarak ses frekansları, müzik ve insan algısı arasındaki ilişkiyi ele almaktadır. Çalışma, yaratıcı bir güç olarak sesin metafiziksel ve dini göstergelerini sorgulayarak başlamaktadır. Daha sonra müzik ve insan işitme sürecinin fiziğini derinlemesine inceleyerek; tonalite ve tınıyı şekillendirmede frekansların rolünü vurgulamaktadır. Araştırmada, farklı ayarlama standartlarının önemi ve etkileri, özellikle 432Hz ayarlamasının daha yaygın olarak kullanılan 440Hz standardı ile karşılaştırılması da gözden geçirilmiştir. Ek olarak, askeri ve ticari çıkarları düşündüren 440Hz ayar standardının benimsenmesinin ardındaki tarihsel bağlam ve potansiyel nedenler de araştırılmıştır. Bu yönleri inceleyerek makale, farklı müzik akortlarının insan refahı ve algısı üzerindeki etkilerine ilişkin anlayışı derinleştirmeyi amaçlamakta ve daha fazla araştırmaya çağrı yapmaktadır. Bu inceleme yazısı, alanda daha fazla araştırma yapılması için bir eylem çağrısı görevi görmektedir.

Anahtar Kelimeler: frekanslar, yeniden ayarlama, müzik, 432 Hz, 440 Hz, insan algısı.

1. INTRODUCTION

"When he decrees a matter, he only says to it, 'Be,' and it is." (Surah Ali 'Imran, Quran). This powerful verse highlights the divine power and authority of Allah. From a metaphysical perspective, some interpretations suggest that the sound of Allah's command, "Be," resonates throughout the universe, setting in motion the creation of whatever he wills. This concept implies that sound vibration, in a broader sense, is intricately connected to the act of creation itself. The earliest existing text on Jewish esotericism, Sefer Yetzirah, according to Elson (2004), teaches that sound is God's fundamental creating force (Pretorius, 2011). Here, it would be good to remember Nicola Tesla's quote, *"If you wish to understand the universe, think of energy, frequency, and vibration."*

The following questions should be asked regarding this issue: Is sound the beginning of all creation? If so, can the creation be changed as in the expression in this verse, *"...and I shall command them - and they will corrupt God's creation!"* (Surah al-Nisa, Quran)?

If these expressions are accepted as the basic assumptions in the study, it can be expected that significant changes will occur regarding sounds and frequencies. Therefore, this study focuses on frequencies and their effects on human cognition.

1.1. Aim of the study

The primary claim that will be defended in this study is exploring frequencies in music and human perception, the journey of 432 Hz tuning to 440 Hz shift, and the military and commercial motives behind musical frequency studies. By shedding light on these aspects, it is aimed at deepening understanding

of the intricate relationship between frequencies, music, and human perception. Thus, the goal is to thoroughly assess the claims and findings regarding the change in tuning.

1.2. Significance of the Study

It has been argued that 432 Hz is closer to the natural frequencies of the universe and is more compatible with the vibrations of nature (e.g., Tuis, 2010). Accordingly, 432 Hz is more natural and relaxing and is more compatible with the human body and mind. It is thought that 432 Hz makes people feel a deeper connection and offers a more emotional or spiritual experience. At the same time, 432 Hz is a frequency to which a certain meaning is attributed in some mystical belief systems or theories about natural harmony. So why was 432 Hz, which is so compatible with humans and nature, changed to 440 Hz? Is what is written in the holy texts true? The answers to these questions can be understood by examining the historical process and causes of change. Therefore, the investigation of the issues addressed in this study is important.

2. METHODS

The research is in qualitative research design. Academic articles and books written on the subject of the study were examined. To access these publications, reputable databases such as Wos, Scopus, and EbscoHost were scanned. The obtained data were reviewed. The model of this research is an *interpretivist literature review*, which is an approach to reviewing and analyzing existing literature that is guided by the principles of interpretivism (Denzin & Lincoln, 2018). Interpretive reviews see the essential tasks of synthesis as involving both induction and interpretation. In this study, the existing literature related to the research topic will be thoroughly examined.

2.1. Ethical Permission

In this study, all rules specified within the scope of the "*Higher Education Institutions Scientific Research and Publication Ethics Directive*" were followed. None of the actions mentioned under the title "*Actions Contrary to Scientific Research and Publishing Ethics*", which is the second part of the directive, have been carried out.

3. FINDINGS

3.1. The Influence of Frequency on Music, Human Hearing, and Vibrational Resonance

From a physics perspective, music is composed of sounds produced by waveforms whose frequency is measured in hertz. The hertz (abbreviated to 'Hz') used to measure the frequency of cycles expresses the cycles per second (1 Hz=1 cycle per second) (Oxford Reference, 2023). The tonality and timbre of the sounds are determined by the frequency values.

The nominal range of human hearing typically extends from about 20 Hz to 20,000 Hz (Bedard & Georges, 2000). However, this range can vary among individuals due to factors such as age, exposure to loud noises, and overall hearing health. Frequencies below 20 Hz, known as near-infrasound, are typically felt rather than heard. Frequencies below 1 Hz, known as far-infrasound while frequencies

above the upper limit of 20.000 Hz, known as ultrasound, are also typically not heard by humans (Bedard & Georges, 2000). Human beings possess a remarkable vocal range, exhibiting a variety of frequencies in their vocalizations. The range of human vocal frequencies typically spans from about 80 Hz to 1.100 Hz, with individual variation. Also, the electrical activity in the human brain gives rise to brainwaves that can be categorized into different frequency bands. These bands include delta (<4 Hz), theta (3-7 Hz), alpha (8-13 Hz), beta (>13 Hz) (Köktürk, 2013), and gamma (>30 Hz) (Ray, Niebur, Hsiao, Sinai, & Crone, 2008). Every living and nonliving creature on the planet vibrates at its own special frequency (Rose, 2021). Flowers, trees, rivers, and lakes all have unique vibrations. Quantum physics describes the universe as nothing more than vibrating strings of energy. The human body and organs have an electrical frequency, and persons' health can be determined by its frequency (Walker, 2023). Dr. Bruce Tainio, from Eastern State University found in 1992 that a healthy body resonates at a frequency of 62 to 72 MHz (Walker, 2023) and when your frequency drops to 58 MHz (Hamlou, 2020), that is when the process of disease begins. Every thoughts and emotions have also different frequencies. Emotions (e.g. Marghzar, 2022) and thoughts (e.g. Cuadrado, Lopez-Cobo, & Mateos-Blanco; Tajadura-Jimenez, 2020) could be affected by sound.

3.2. The Significance and Effects of 432 Hz Tuning and Schumann Resonances on Human Perception and Well-being

Some theories assert that 432 Hz corresponds to specific mathematical relationships or harmonics associated with the golden ratio and the Schumann resonances (Eischen, 2016; Plomp & Levelt, 1965). The calculation of 432 Hz as a specific frequency in relation to the musical note A4 (LA) is based on the standard tuning system and the mathematical relationships between musical intervals (Halpern, 1995). It is attributed to Pythagoras, an ancient Greek philosopher and mathematician. While Pythagoras himself did not specifically calculate the frequency of 432 Hz, his work laid the foundation for understanding the mathematical relationships between musical notes and the concept of harmonic frequencies (Bowles, 2017). 432 Hz positively affects the chakras, expands the feelings through the heart chakra, and accelerates our spiritual growth (Beaulieu, 2010). Our subconscious understands that the frequency of 432 Hz is an awakening, an opening of the heart center, of love, harmony, and joy (Paul, 2019). 432 Hz is often referred to as the "frequency of the universe" (Paul, 2019). Listening to music tuned to 432 Hz can create a sense of calmness, relaxation, and harmony (Beaulieu, 2010).

Schumann resonances (SR) are a set of natural electromagnetic frequencies that occur in the Earth's ionosphere (Helliwell, 1965; Schumann, 1952). SR is in the extremely low-frequency (ELF) range and falls below the threshold of human hearing (Sentman & Fraser, 1991). The primary resonance, known as the Schumann fundamental frequency, is around 7.83 Hz (Sentman & Fraser, 1991). However, there are other resonant frequencies as well (König, 1979). These are approximately 7.83 Hz, 14 Hz, 20 Hz, 26 Hz, 33 Hz, 39 Hz, and 45 Hz (Timofejeva et al., 2021).

There is a connection or synchronization between the Schumann resonances and human brainwave activity (Persinger, 1987). These seven SR frequencies closely correspond with alpha, beta, and gamma brainwaves (McCraty & Deyhle, 2015). It is proposed that exposure to or synchronization with the Earth's natural frequencies can have positive effects on human health, well-being, and consciousness (Muehsam & Pilla, 2009). For instance, there are underground structures known as "çilehane" or "çilehane caves" in Turkey. These caves have historical and cultural significance in the region. Çilehane caves were used by Sufi dervishes as places of retreat, meditation, and spiritual practice.

The Schumann resonance on earth, as determined by NASA (National Aeronautics and Space Administration), is approximately 8 Hz. Therefore, as 8 Hz is a submultiple of 432 Hz for the relationship between frequency and octave music, this would be in mathematical connection to 432 Hz (as cited in Calamassi & Pomponi, 2019; "NASA", 2023). The concept of 432 Hz tuning means the frequency at which a musical note A4 (LA) in the central octave of the piano is tuned. It means that the A note is tuned to vibrate at 432 cycles per second. Listening to music tuned to 432 Hz can create a more harmonious and relaxing experience, as it is believed to resonate more naturally with the human body and align with the vibrations of nature.

The proponents of 432 Hz tuning argue that it exhibits greater resonance and harmony with the human body and the natural environment, positing that it induces a state of calmness and tranquility (Hennawi, 2018; Horowitz, 2011). However, it should be noted that the contemporary standard for musical tuning is predominantly set at 440 Hz (American National Standards Institute, 2020). The adoption of 440 Hz as the standard pitch has been widely embraced in the music industry and is commonly employed in various musical compositions and performances (International Organization for Standardization, 2004). Further research is necessary to comprehensively explore the potential psychological and physiological effects of different musical tunings on human perception and well-being.

3.3. The Journey of A=440 Hz: From Controversy to Standardization

There are three important dates represent significant milestones in the establishment of A=440 Hz as a widely accepted and universal pitch standard in the world of music. These dates are 1939, 1955 and 1975. These dates symbolize the gradual evolution and solidification of A=440 Hz as the preferred pitch standard, shaping the way music is composed, performed, and enjoyed worldwide.

In 1939, just before the outbreak of World War II, an international conference was held in London, funded by oil companies. The Berlin Radio Acoustics Commission organized this meeting at the British Standard Association internationally. At this conference, various international experts came together with the aim of determining the standard frequency of music. The overarching purpose of the get-together was to create a reference point for tuning musical instruments and enabling orchestras to play in harmony. It is recommended in this conference that the standard pitch be set at A=440 Hz (the tuning of the German radio), and this was accepted. But an objection came later, without delay. Because the conference was organized collaboratively by Britain and Germany, it did not extend an invitation to French composers

and musicians. A French composer, the Paris Conservatoire's Prof. Robert Dussaut objected to this norm. He thought that the 440 Hz frequency would be detrimental to the artistic and cultural values of music. In order to maintain musical harmony and the universe's musical vibration, they insisted that the tuning frequency of the LA tone, 432 Hz, not be altered. Around 23,000 French artists signed a petition opposing the standard, which Dussaut was able to compile in large numbers. Their vote was a strong protest against the use of 440 Hz as the default frequency in music. They may have objected, but the choice to make 440 Hz the accepted musical standard persisted.

In 1955, A=440 Hz was officially adopted by the International Standards Committee. This committee known as the International Organization for Standardization (ISO) today. The ISO assigned the reference number ISO-16 to this standard. This decision was made based on the proposal put forward in Stuttgart in 1834, which advocated for A=440 Hz. With this approval, A=440 Hz became the internationally recognized standard for tuning musical instruments.

In 1975, the adoption of 440 Hz as a truly universal standard for tuning musical instruments reached a significant milestone. In 1955, A=440 Hz was officially adopted as the standard by the ISO, while by 1975, it had gained universal acceptance and was widely implemented as the standard tuning frequency in the music industry. The 20-year gap between these two dates allowed for the dissemination and acceptance of the standard among musicians and music communities worldwide. By this time, A=440 Hz had gained widespread acceptance and usage among musicians, orchestras, and music institutions around the world. The music we listen to today is therefore all calibrated to the 440 Hz frequency (as cited in Calamassi & Pomponi, 2019). The last time ISO 16:1975 Acoustics-Standard tuning frequency (Standard musical pitch) was evaluated and approved was in 2022 ("ISO 16:1975", 2022).

This decision was primarily driven by practical considerations, such as facilitating international musical collaboration and improving instrument manufacturing and design. However, there are some important claims about the real reason for this change. For instance, The Liberal Party (Vrijzinnige Partij) of the Dutch supports A=432 Hz as a standard on the unproven grounds that Joseph Goebbels was responsible for the introduction of A=440 Hz and that it produces "disarray" in music and society (as cited in Gribenski, 2020; Korteweg, 2017). Although these claims are called conspiracy theories in many places, it is thought-provoking that the change was accepted despite the musicians' opposition to it and their resistance for a long time. Therefore, it would be useful to examine these claims.

3.4. The Rockefeller-Rothschild Alliance and A=440Hz: Military and Commercial Motives Behind Musical Frequency Studies

The Rothschild-Rockefeller partnership funded scientific research on musical frequencies conducive to war-making between World Wars I and II (Baker, 2015; Sutton, 2002). This alliance was represented by organizations such as the Rockefeller Foundation and the U.S. Navy (Dye, 1986; Quigley, 1966). The primary objective of these studies was to identify specific musical factors that could induce

psychopathology, emotional distress, and even provoke "mass hysteria" (Schaeffner, 2013; Summers, 2014). These investigations were conducted with the intention of achieving both military goals and profitable population control (Hounshell, 1984; Sutton, 2002).

The academic direction of acoustic energy researchers was facilitated through grants from the Rockefeller Foundation, in collaboration with the National Defense Research Council and United States' Navy as evidenced in the Rockefeller Foundation's (1939-1944) archives (Quigley, 1966). Among these researchers was Harold Burriss-Meyer, who gained recognition for his consulting services to the Muzak Corporation (Pinch & Bijsterveld, 2012; Sterne, 2012). Burriss-Meyer, a Stevens Institute of Technology drama teacher and audio engineer in New Jersey, played a significant role in the commissioned research (Grauer, 2011; Sterne, 2012). The collaboration between these institutions and researchers aimed to explore the scientific aspects of acoustic energy and its potential applications (Bijsterveld, 2008; Pinch & Bijsterveld, 2012).

James Tobias, a professor of English at the University of California, delved into the archives of the Rockefeller Foundation (RF) and documented research that eventually led to the development of acoustic vibrations for use in psychological warfare (as cited in Horowitz, 2010; Tobias, 2009). Tobias claims that Burriss-Meyer worked with the Department of Defense during World War II, "including building speaker arrays deployed on warplanes such that enemy combatants could be addressed from the air" in order to create psycho-emotional effects that caused "mass hysteria" (Horowitz, 2010). Tobias claims that Burriss-Meyer changed his mind after realizing that "audio management of human emotions was conceivable for a large enough fraction of an audience to enable effective crowd control but evidently fulfilled a military objective.

This is the greatest justification for the relationship between this activity and the Rothschild-Rockefeller family's growing war investments in United States, Great Britain, and Germany in terms of timing, topic matter, and Foundation support (Horowitz, 2010). In the end, it resulted in the adoption of A=440 Hz as the Western World's standard musical tuning. The disturbing character of this standard tuning, which is corroborated by evidence from other sources, raises the possibility that these parties were involved in research into potentially hazardous musical frequencies for use in both military and commercial contexts. The implications of their actions strengthen the suspicions about dark intentions behind the promotion of A=440Hz as a widely accepted musical standard.

After this tuning was embraced by European musicians and adopted by the British Standards Institute (BSI) in 1939, Rockefeller-Rothschild "black-op" executives hired Joseph Goebbels, a Nazi party propagandist. Goebbels was on his way to becoming England's media foe at the moment. From 1933 through 1945, Joseph Goebbels, a well-known individual in Nazi Germany, held the position of Minister of Propaganda and Public Enlightenment. Goebbels played a crucial role in spreading Nazi propaganda and shaping public opinion in support of Adolf Hitler and the Nazi Party. Goebbels reportedly stated that A=440 Hz tuning makes people feel more anxious. It has been observed that the destructive effects of 440 Hz on humans lead them to think and feel in a specific manner, causing them to experience inner

chaos. Furthermore, tuning all the music in the world to 440 Hz is believed to turn it into a "weapon of war."

4. CONCLUSION

Music, with its significant role in individual and collective human life, has been a constant presence across cultures and historical periods (Cochrane, Fantini, & Scherer, 2013, p. 471). It holds a remarkable power over the physiological mechanisms of the human body and mental processes, contributing to its pervasive nature. The role that music plays in emotionally charged situations and socially significant activities highlights its power to elicit strong emotional reactions and promote social bonding (Cochrane, Fantini & Scherer, 2013, p. 471). In addition, behavioral science, which is sometimes underappreciated in comparison to other scientific fields, emerges as a potent force in affecting society, politics, and economics. Given that the cosmos is made up of matter that vibrates at various frequencies, including ourselves as humans, it is clear that sound plays a basic function (Estulin, 2015, p. 211). Sound is a powerful tool for promoting healing and boosting well-being since it has the power to have tremendous effects on both our mental and physical states. The exploration of frequencies in music and their impact on human perception reveals a complex interplay between physics, psychology, and historical influences.

The contentious nature of musical frequencies is further shown by the discussion over the standard tuning frequency in music, in particular A=440 Hz. The golden ratio, the Schumann resonances, and other mathematical correlations are said to be in resonance with the alternative tuning of A=432 Hz, which proponents claim has beneficial effects on the chakras and spiritual development. The topic is further complicated by the Schumann resonances' coordination with human brainwave activity, which raises the possibility that natural frequencies may have an impact on cognition and health. However, historical events influenced by political, religious, and commercial interests can be used to explain how A=440 Hz came to be accepted as the standard tuning frequency.

The historical context raises the possibility of a negative aspect to the adoption of A=440 Hz, even though more study is needed to properly grasp the psychological and physiological impacts of various musical tunings on human perception and well-being. The link between the Rockefeller-Rothschild partnership, national security concerns, and the development of the standard tuning frequency emphasizes the importance of critical analysis and investigation of the subject. The following questions were asked at the beginning of the study: Is sound the beginning of all creation? If so, can creation be changed as stated in the verse? At the end of this study, it was concluded that sound and vibration initiated the creation and were the creation passwords of the universe, just as Nicola Tesla said. The distortion and change of creation mentioned in the sacred texts is essentially the distortion and change of frequency. It is truly sad that the manipulators persistently try to make changes in natural sounds and frequencies that harm humans and that this distortion is achieved.

In conclusion, research on musical frequencies and how people perceive sound reveals a complex web of historical, psychological, and scientific influences. This review encourages continued research into the potential advantages and disadvantages of various musical tunings in order to comprehend their impacts on both individuals and society at large. Brave researchers are needed in this field.

Ethical Statement of the Research

In this study, all the rules specified in the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions" were followed. None of the actions specified under the second section of the Directive, "Actions Contrary to Scientific Research and Publication Ethics", were carried out.

In addition, according to ULAKBIM TR Index 2020 criteria, there was no need for any data collection requiring ethics committee approval in the study.

Declaration of the Contribution Rate of the Researchers to the Article:

1st author contribution rate: 100%

Conflict of Interest Statement:

There are no personal or financial conflicts of interest between the authors.

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