

# Analysis of Health-healing Effects According to Acoustic Signal Characteristics in psychoacoustic

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## Abstract

The effects of sound on human body have been proven in various ways, and the principles of the bowls used as healing tools have been studied through acoustic analysis. The bowls that can produce sound are made of bronze and tin, and they vary in size and thickness. One or more various bowls are placed on the human body or installed around the human body and a small bar is rubbed or knocked by using the use or hand to generate sound. This vessel generates different frequencies depending on size and thickness, which is different depending on the diameter and depth of the vessel. It vibrates the human brain and organs as well as flesh and bones to regain the natural frequency of the human body. The frequency is generating a resonance frequency of some type and how it reacts to the human body through frequency analysis and brain wave analysis.

**Keywords:** Sound therapy, human body effect, bowl, sound effect, frequency.

## 1. INTRODUCTION

Human beings are living in the magnetic space of the earth, and they are experiencing, feeling and living in various phenomena under such influence. Until now, it has been proven and studied that the human body has various frequencies by part. As the measurement and analysis of modern science develops, this phenomenon is being analyzed by subdividing the frequency affecting the human body and proceeding to various applications. However, among the artificial sounds generated by the development of civilization, the irritating or noisy noise generates another vibration frequency, which interferes with the natural vibration frequency of the human body. This destroys the balance of our body, causes fatigue and helplessness, and destroys the immune system, which can cause various diseases. It is said that the sound of nature, sound by various tools, and sound effect sound have been used as a way

to correct and heal the balance of the natural frequency harmful to the human body <sup>[6][7][8][9][10][11]</sup>. In this paper, we studied the acoustic analysis of the vessel used as a method to restore and maintain the balance of the human body's natural frequency, and the brain wave of the human body who listens and responds to the sound. The results will be a chance to verify the reliability of the sound use of this healing vessel and will contribute to finding the possibility of using similar vibration generating tools in the future <sup>[1][2][3][4][5][6]</sup>.

## 2. STUDY OF BOWL WITH A NATURAL FREQUENCY

Sound is created by a unique resonance frequency and transmitted to its wave. That is the resonance frequency. The waves that can transmit this vibration are well transmitted and generated on the earth where air exists. Nature is created and disappeared by itself, forming airflow by the gravity and magnetic field of the solar system even if it does not artificially generate sound. The human body is affected by the movement of natural organs, which vibrates itself and generates sound. The human body's sound can be detected by precise measurement device with ultra-low frequency and ultra-high frequency which cannot be detected by our hearing, and it is made of various sounds. However, as science develops and culture develops, an environment in which natural frequency and artificial frequency are mixed is created, and these threaten the health of the human body <sup>[2][4][5][11][12][13]</sup>. The vessel that generates high frequency through high salt has been developed from Nepal, Tibet and India, and it is a bowl-shaped healing tool based on resonance phenomenon, one of the characteristics of sound vibration. A tuning phenomenon is a phenomenon in which vibrations generated in nature naturally blend to balance each other. It is a principle that helps to recover the natural vibration frequency by changing the rhythm of the human body, which has been tuned to noise pollution and lost balance, to the sound arranged by the sound of this bowl and becoming safe. This bowl is made by mixing seven metals (gold, silver, iron,

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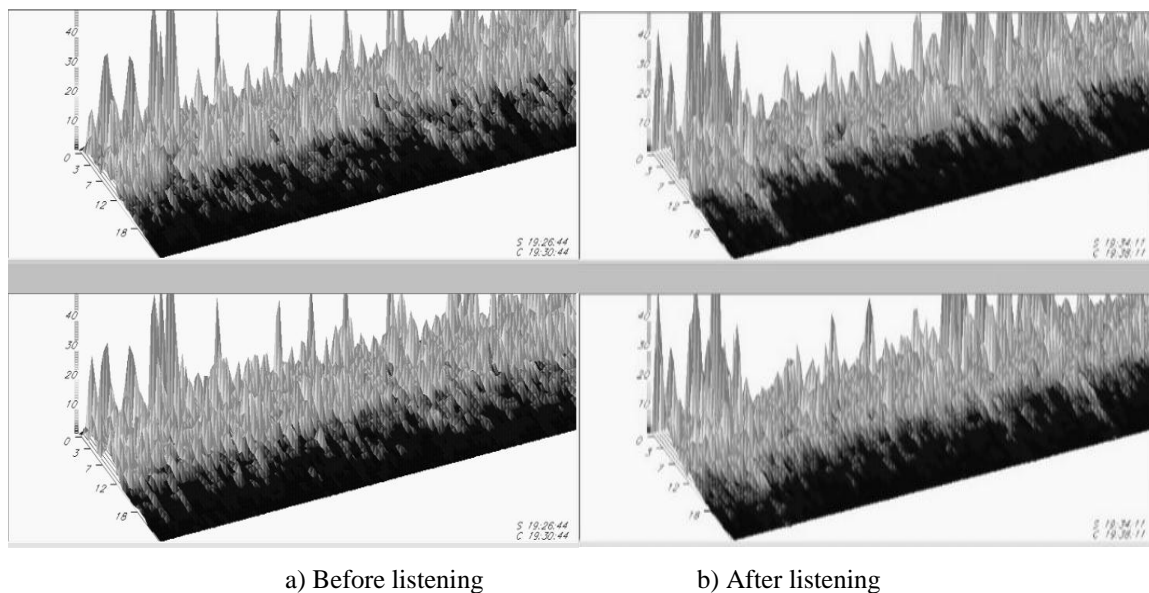
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mercury, tin, copper, and lead). The main material is brass and tin, which is useful because it has high strength. The harder it is, the clearer it is and the longer it is used. The way it makes a sound is usually rubbed to create the vibration frequency of the echo, or to make the vibration frequency. Also, it generates various frequencies by making strong or weak, rough or soft sounds within the range of moderate intensity. This is a set of twelve, which are used to sit or lie in a comfortable position, hold it directly, or touch each part of the body, and use it close to the body. In order to heal the internal organs of the human body, a large diameter bowl is used to generate a long-lasting bass, and to heal the brain, skeleton, and skin, a bowl of size suitable for each unique frequency is applied to various uses.

### 3. ACOUSTIC FREQUENCY ANALYSIS OF TOOLS WITH RESONANT FREQUENCY

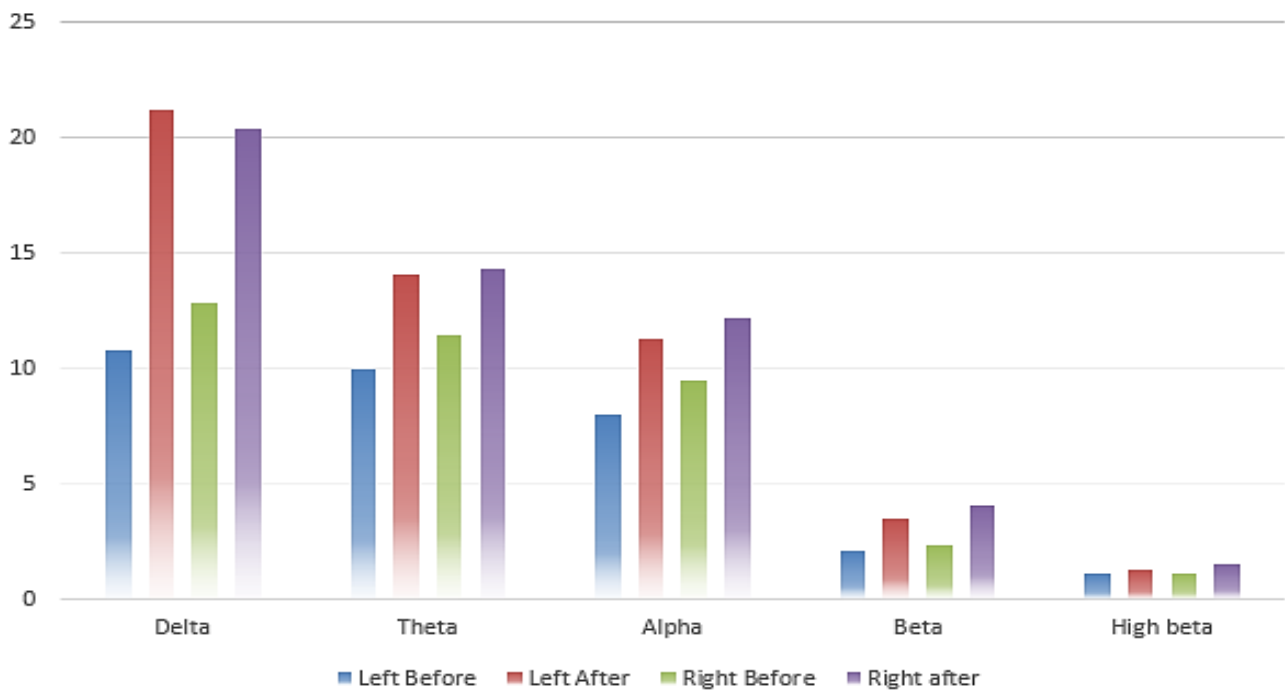
The cry of a beast is the sound of living creatures and is the sound of the highest predators among carnivores with unique frequency and energy as sounds. The characteristics of the crying beast are caused by the phenomenon of amplifying the shaking of beast's unique vocal cords with resonance. It also has sound characteristics that generate strong low frequency and ultra-low frequency energy irregularly. In order to compare and analyze the sound of beast cry and the real sound, the

sample was prepared by sampling the sound of beast cry and the sound sample using jar and washboard. The collected beast cry and real sound were analyzed by dividing into time domain, frequency domain, spectrogram domain, energy domain and Moss test domain. Among various types of bowls, the types used to perform tea and healing therapy were selected and analyzed in various parts of the human body. The spectrum was analyzed with Sample Rate 4,000Hz, channel mono and resolution 16bit, and the acoustic frequency characteristics were divided into three parts. The first part evaluates the bandwidth in the ultra-low frequency range below 100Hz and evaluates the basic frequency of the human body through analysis. The second part is the frequency domain which can affect the human brain, 100~1,500Hz, and three distinct resonance points are evaluated. The third part is the presence of two peak points in the 1,500 to 2,500 Hz area, which gives fresh stimulation to human brain waves, which helps to restore the basic frequency of the human body more easily. These three points and two points can be used to find and reinforce the frequency band that affects human life, and to improve tension and concentration by complementing the low frequency band of less than 1,000Hz. The effects of the sound are enhanced by analyzing these frequency characteristics, and the sound of this bowl contains the sound frequency familiar to the East and the West. Therefore, these frequencies affect the natural frequency of the human body in general.



**Figure 1.** Body Frequency Associated with the Typical Scale

	<b>Do</b>	<b>Re</b>	<b>Mi</b>	<b>Sol</b>	<b>La</b>
<b>body organ</b>	spleen	lung	liver	heart	renal



**Figure 2.** EEG Characteristics by Acoustic

The human body is composed of organs and muscles, and both the skull, spine and various bone parts have their own frequencies. However, in modern society, due to various noise pollution and stress, the unique frequency is disturbed, and fatigue and disease are suffered. If the destruction of the human natural frequency becomes worse, the symptoms accumulate, and the function of a specific part may be lost, and it may have a fatal effect on health. In this respect, this bowl sound has a wide range of frequencies to restore the overall human body's natural frequency normally, which helps to recover or heal the human body.

#### 4. EEG ANALYSIS BY ACOUSTIC ANALYSIS

EEG was analyzed to hear this sound and to examine mental changes. EEG was analyzed by Delta, Theta, Alpha, Beta-L and Beta-H waves, respectively, based on the characteristics of EEG. A typical EEG Delta wave is a low frequency of less than 4Hz, where it is dreamed or highly concentrated in sleep. Theta waves are in the range of about 4 to 8 Hz and are generally low-frequency EEGs, which are more awake than Delta waves but are close to sleep and are comfortable and dull in half-sleep. Concentration and memorization are also higher than Delta waves. Alpha waves are EEG waves with a frequency of about 8 ~ 13Hz and are usually rested EEGs of the general public. When measuring the change of EEG in a specific situation, Alpha waves are based on Alpha waves. If the Alpha wave is faithful, it is a mental and physical health condition. Beta waves have the frequency range of 14~100Hz or higher which is the fastest among EEGs and are classified into Beta-L and Beta-H. Beta waves are characterized by the most active movement of the brain, which occurs in anxiety, anxiety, and tension. Beta-L wave is low Beta wave, which is relatively less symptomatic,

and Beta-H wave is high Beta wave, which is severe. The reason why games and gambling addicts change their brainwave range is due to these various brainwave characteristics.

To analyze the EEG response to acoustic characteristics, EEG was measured before listening to the resonant sound, and EEG was measured after listening to the sound. First, the results of the measurement of the EEG before listening to the sound showed that the Delta wave was 10.82 in the left brain, theta wave was 8.93, the Alpha wave was 8.01, the Beta-L wave was 2.11, and the Beta-H wave was 1.09. Most of them were mainly Delta, Theta, and Alpha, and Beta-H was insignificant. In the right brain, the Delta wave is 12.85, the Theta wave is 11.45, the Alpha wave is 9.51, the Beta-L wave is 2.31, and the Beta-H wave is 1.11. Overall, it was mainly focused on Delta, Theta, and Alpha, and the number of Delta was the highest. After listening to the sound, the left and right brain waves were divided into before and after the evaluation of changes in each brain wave area. The change in the delta wave change was the biggest change in the left brain and the right brain also showed an increase trend. Next, theta wave showed an increase in left and right brains, and alpha wave showed an increase in left and right brains. The increase in alpha wave levels measured in a comfortable state, and the increase in the theta and delta waves that appear when they reach meditation and sleep, are characterized by the fact that they have healing efficacy by bringing mental comfort and stability.

#### 5. CONCLUSION

The frequency graph for acoustic analysis of this sound shows that the frequency band below 200Hz is wide and has a strong bandwidth. This is a medium and low frequency band with a

large energy that can tune the human body with vibration. Especially, since it has the power to be transferred to the inside organs as well as the skin, it restores the natural frequency of the organs and stabilizes the human body. Next, there are several distinct waveforms in the range from 200Hz to 2,000Hz, which can be seen to increase the effect on healing and healing because these waveforms give psychological concentration and freshness. This sound shows that the brain wave that usually generates alpha waves gradually moves to theta or delta waves. Theta or delta is a waveform that is mainly shown in meditation or sleep, so this sound makes people's psychology very comfortable and shows that the healing effect is great, and healing is the result. Today, industrialization of modern civilization gave mankind an opportunity to live a convenient and elegant life, but unfortunately it causes various soot and noise. Such stress and various diseases of modern people are solved through treatment by medical system, but nowadays, various methods are being sought for solutions. For this reason, the solution of healing concept using various methods is being studied for the purpose of preventing disease and maintaining health for the health promotion of the people. With this study, it is worth studying continuously how the acoustic structure affects the natural vibration frequency of the human body by analyzing the acoustic structure through various types of bowls in the future.

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