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A Study about Development of Hypersonic Wave Sound based on the Sound of the Waves

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Abstract. Are intended to be man-made, there are ultrasonic spontaneous, but is typical and the sound of the waves on the coast ultrasound, the most spontaneous (Tsutomu et al, 2000). In fact, research ultrasound such what effect on the human body, such as on what effect the brain has not been carried out mostly in the country. These studies, if it is verified or become investigation, to be effective, that it may be utilized in the field of education and medical equipment and development of application products to various future, these studies require very some The purpose of this experiment, let's examine ultrasound particular occurrence in the sound of the waves how they affected the brain, and unlike the method in which a result, the previous studies, and a separate ultrasonic instrument every the experiments were performed by fabricated. In this experiment, the experiment advanced, and to be implemented separately only a specific frequency of 40khz the effect of increasing the alpha waves appeared, was prepared in another device.

Keywords: ultrasound, hypersonic wave

1 Introduction

In the non-audible range, in my sound, ultrasound cannot hear the daily life. Are intended to be man-made, there are ultrasonic spontaneous, but is typical and the sound of the waves on the coast ultrasound, the most spontaneous (Tsutomu et al, 2000). In fact, research ultrasound such what effect on the human body, such as on what effect the brain has not been carried out mostly in the country. These studies, if it is verified or become investigation, to be effective, that it may be utilized in the field of education and medical equipment and development of application products to various future, these studies require very some. Therefore, in this study, in order to study the effect of ultrasonic waves on human body, and to advance the analysis of the EEG. Be most effective for the sound of the wave is relaxing degree of concentration as compared to the sounds of nature other is known. It has been utilized

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for the purpose of inducing the relaxation of tension natural music with the help of this, you record the sound of the waves or to make the learning and rehabilitation and In the non-audible range, in my sound, ultrasound can not hear the daily life. Are intended to be man-made, there are ultrasonic spontaneous, but is typical and the sound of the waves on the coast ultrasound, the most spontaneous (Tsutomu et al, 2000). In fact, research ultrasound such what effect on the human body, such as on what effect the brain has not been carried out mostly in the country. These studies, if it is verified or become investigation, to be effective, that it may be utilized in the field of education and medical equipment and development of application products to various future, these studies require very some. Therefore, in this study, in order to study the effect of ultrasonic waves on human body, and to advance the analysis of the EEG. Be most effective for the sound of the wave is relaxing degree of concentration as compared to the sounds of nature other is known. It has been utilized for the purpose of inducing the relaxation of tension natural music with the help of this, you record the sound of the waves or to make the learning and rehabilitation and psychotherapy

Research on ultrasonic and sound of the waves, have been actively studied mainly in Japan. To approach scientifically ultrasound, Japan, was utilized primarily biological information in the brain, such as PET and EEG. EEG refers to the electrical changes that are measured on the surface of the brain along with the activity of the nerve cells in the brain. Depending on the frequency, it is classified as gamma waves (Gamma30 Hz or more) delta wave (Delta1-3 Hz), sweater school (Theta4-7 Hz), alpha wave (Alpha8-13 Hz), beta wave and (Beta14-30 Hz) be. Delta waves occur mainly at the time of deep sleep. Sweater faction, appear mainly at the time of deep sleep and relaxation. Alpha waves occur when concentration or relaxation. Arousal and head relaxed state with his eyes closed is clear, alpha waves are involved in the concentration also appear. In addition, alpha wave is associated with improvement of execution, can affect memory improvement and attention concentration that appeared by increasing the range of the alpha wave is high for the performance of the memory task has been reported (Chang Sokuu , 2011 re-reference).

Yonezawa (1998) were run using the spontaneous ultrasonic sound waves. Using a Super Audio CD, which is made a special From up to 100kHz was particularly intended for 11 students. Result of the experiment, stimuli ultrasonic component has entered to the sound of the waves was significantly induced alpha waves. In this case, stimulation of the sound pressure of 55dB at 35kHz and 45kHz, to obtain the effect of alpha waves increases.

In a similar study, (2000) is the first study, when I heard the ultrasound, we measured the brain waves by using the electrode of twelve fellow of Hutta and other Choi Jong-in Japan. Also in this study, with the help of Super Audio CD, and evaluations were carried out appropriate amount of emotional changes with the mood scale of six confusion anxiety and tension, discouragement and depression, fatigue and hostility and anger, and lively. 70% or more research results Hutta Choi Jung-in (2000) increased alpha wave. In addition, colleagues of Tsutomu other team of Kyoto University School of Medicine in Japan has become the main axis (2000), a result that made the device with the addition of ultrasonic range sound of the waves of the actual, the sound, which in the brain of actual I studied would affect like. (13 women and 15 men of 43 years old from 19 years old) Japanese volunteers of 28 people participated

in the EEG experiment, (8 men of 34 years from 19 years, 4 women) 12 volunteers is PET experiment participated in, (11 women and 15 men of the 31-year-old from 18 years old) volunteers of 26 people participated in the experiment. I was use to manufacture our own ultrasound equipment for ultrasonic wave generation in particular. The results of the EEG experiment, the result was that alpha waves of the back of the head to increase than to the product for me to hear together the sound of the waves and ultrasound, the sound of the waves and ultrasound alone me hear.

Colleagues of Tsutomu Other (2000), concluded that section ultrasound and the sound of the waves was put together than the sound of the waves and ultrasound purely to increase the alpha waves much on the basis of the results of these .

The purpose of this experiment, let's examine ultrasound particular occurrence in the sound of the waves how they affected the brain, and unlike the method in which a result, the previous studies, and a separate ultrasonic instrument every The experiments were performed by fabricated. In this experiment, the experiment advanced, and to be implemented separately only a specific frequency of 40khz the effect of increasing the alpha waves appeared, was prepared in another device.

2 Experience method

2.1 Development of ultrasonic generator

In this experiment, the experiment advanced, and that the effect of increasing the alpha waves appear to implement separately only a specific frequency, as shown in FIG 1, the super 40kHz create another piece of equipment we examined the effects of brain waves through the ultrasonic generator for generating sound waves.

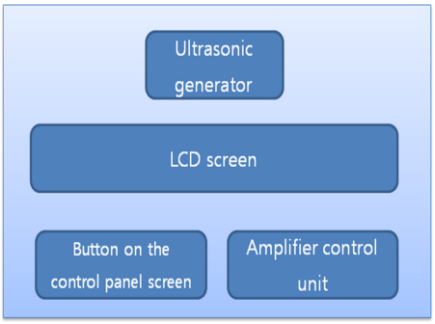

Fig. 1. Ultrasonic generator

2.2 Participants

It is intended for those who have agreed to be intended for 60 male and female adults of healthy South Korea of 19 years to 59 years of age, to understand the description of the experimental content of this research, to participate in person, life of the institution of common experiments have been carried out and approved by the research ethics committee of (IRB).

2.3 Experience method

The computerized, EEG, Fp1, Fp2, F3, F4, T3, T4, O1, O2 with 10/20 international electrode placement method was measured using (Laxtha, Inc, Korea) and QEEG-8 is electroencephalograph I have attached the electrodes of a total of 8. Of the study participants for 60 persons from <Table 1>, after classifying randomly 2 populations and ultrasound test groups ultrasonic entered does not enter, and analyzed by measuring the population for each.

Table 1. How to test and control experiments

	Personnel	Stimulus information
Experiment	30 people	1 ultrasound alone (5 min.)
Group		2 ultrasound + the sound of waves(5 min.)
Control	30 people	1 silence (5 minutes)
Group		2 the sound of waves (5 minutes)

3 Experience result

Were analyzed eight channels of EEG and the ANOVA analysis between experimental groups that were at the same time let the ultrasound and the sound of the waves and the control group sound of the waves was heard. Result of the experiment, the Fp2 and Fp1, there was a significant difference between the populations of the two relative power of the alpha wave. A comparison of the size of the alpha waves, alpha waves increased in Fp2 and Fp1, compared to that he tell me at the same time the sound of the waves of ultrasound than in the control group to the sound of the waves was heard.

Note probability of Fp2 and Fp1 this time is lower than (.05) significance in .030 and .002, a significant difference was observed between both groups. This may be the sound of the waves and ultrasonic waves, the results of the response to ultrasound from prefrontal responsible for judgment and emotional. The channel of the other, an increase in alpha wave was observed. Prefrontal and frontal lobes, tended alpha wave are mainly increased.

The difference between the two groups ultrasound (control group) of silence (experimental group) appeared in prefrontal. There was a significant difference in the two populations between (<.05) appeared to .019 significant probability 0.01 Fp1,

Fp2. This seems alpha waves of prefrontal have increased in the ultrasound than silence.

4 Result

Ultrasound, which is used in this study, is beyond the audible frequency, I used mainly the 40kHz high alpha wave induction most. The experiment to distinguish populations that do not use ultrasonic experiments and population using ultrasound, the experimental subjects, a total of 60 people by 30 people aged 20 to 59 adult healthy men and women participated. Portion obtained significant results throughout the experiment were John John Dzu Yopu portion. Alpha waves results were obtained to increase. This was found to induce a change in brain waves in John John Dzu Yopu ultrasound to determine the rational and emotional. This is consistent with results of studies of the conventional ultrasound. However, the other channels, these changes were not observed. It is possible to use the ultrasonic device that will increase the alpha waves by using the results of these are involved in relaxation and concentration, when applied to real life, improvement in concentration in the future, and take advantage and product it is expected.

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