



RESEARCH ARTICLE

BINAURAL BEATS "AMENABLE OR NOT"

¹Pranav Bhatia, ^{*}¹Suraj U Rasal, ²Shraddha T. Shelar and ³Varsha Thanaji Mulik

¹Computer Engineering Department, Bharati Vidyapeeth University College of Engineering Pune, India

²Department of Information Technology, D Y Patil College of Engineering Akurdi, Pune

³Department of Computer Engineering, Nehru College of Engineering, & Research center, Kerala

ARTICLE INFO

Article History:

Received 20th May, 2016
Received in revised form
21st June, 2016
Accepted 15th July, 2016
Published online 20th August, 2016

Key words:

EEG(Electroencephalogra),
BB (Binaural beats).

ABSTRACT

World has changed and so has Neurology. Researchers in neuroscience could not contain their excitement albeit with the concoction of Binaural beats there are many uncertainties of its usage both because of paucity of knowledge and copious skepticism of people in general regarding the usage of these so called "digital drugs". Binaural basically means listening with both the ears. The sorcery in these beats use the simple phenomenon of "hearing" with both ears with frequencies not more than 1500Hz, with less than 40Hz difference between them. Binaural beats reportedly influence the brain in more subtle ways through the entrainment of brainwaves and can be used to produce relaxation, natural altered states of consciousness similar to what is experienced during meditation, and other health benefits such as pain relief.

Copyright©2016, Pranav Bhatia et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Pranav Bhatia, Suraj U Rasal, Shraddha T. Shelar and Varsha Thanaji Mulik, 2016. Binaural beats "Amenable or not", *International Journal of Current Research*, 8, (08), 35960-35962.

INTRODUCTION

Amenity is the word that is commonly used for today's technology and gadgets. Albeit the technology is essential but today it is more than just an amenity, it's an addiction. The addiction is so abject that life is difficult without these gadgets. Binaural beats are of interest to neurophysiologists investigating the sense of hearing (On *et al.*, 2013). The ability to entrain brain wave patterns opens up an exciting world of mind-boggling possibilities (Todor Mihajloski *et al.*, 2014). Withdrawal symptoms experienced by young people deprived of gadgets and technology is compared to those felt by drug addicts or smokers going "cold turkey", a study has concluded (Nantawachara Jirakittayakorn and Yodchanan Wongsawat, 2015). Now a new kind of amenity has emerged from the advancement of technology that uses brain waves, commonly termed as Binaural Beats. It basically entrain and synchronize our brainwaves to enhance any specific type of brainwave pattern.

A. Brainwaves

Our brain is made up of millions of brain cells called neurons, which use electricity to communicate with each other. The combination of millions of neurons sending signals at once produces a significant amount of electrical activity in the brain, which can be detected using sensitive medical equipment such as an electroencephalogram (EEG) (Juti Naraballobh *et al.*, 2015). This electric activity of brain is also known as brainwave pattern. We can learn to control these waves according to our need but that requires significant amount of practice (Juti Naraballobh *et al.*, 2015). Some people master it in months and some even take years to get to know what's inside their head that needs to be controlled. Since before the medieval times meditation is commonly practiced to control these waves and direct them at some point. Thanks to technology, a new shortcut is now available to even control our brainwaves called binaural beats.

B. Binaural Beats

In general, we are accustomed to being in the beta brain rhythm. We are in a Beta brainwave pattern when we are consciously alert. It is the default and dominant brainwave for most of us most of the time. We are in Beta when we feel agitated, tense, hurried, pressured, afraid and stressed.

*Corresponding author: Suraj U Rasal,

Computer Engineering Department, Bharati Vidyapeeth University, College of Engineering Pune, India.

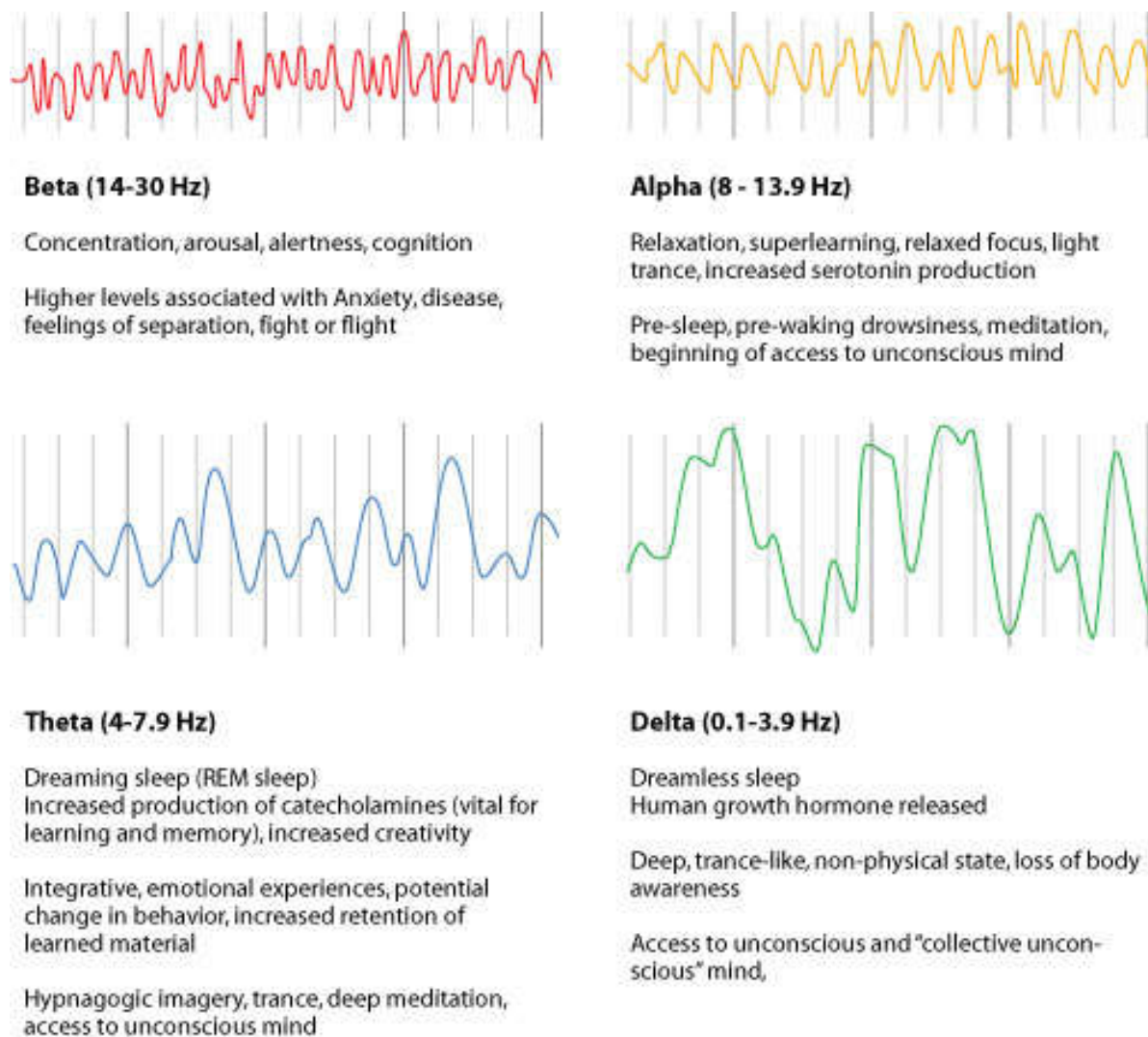


Fig.1. Different types of brain waves (Center point eResearch Institute, 2010)

The frequencies range from 13 to 60 pulses per second in the Hertz scale (Todor Mihajloski *et al.*, 2014). We can also tame these waves by the help of binaural beats. Alpha for instance gives our brain a state of deep meditation and quick learning because it simply slows our brainwaves down. According to neuroscientists, the effect of decreasing the brain rhythm from beta to alpha via deep relaxation techniques and the use of binaural beats, changes the levels of certain beneficial brain chemicals. Similarly Theta and Delta waves can also be inculcated. In general these beats can be used to attain any level of frequencies that are less than 40Hz (Nantawachara Jirakittayakorn and Yodchanan Wongsawat, 2015).

Survey on existing approaches

Binaural beats can relax a person even at the time of high stress with its remarkable relaxation and meditation powers. In everyday life they can effectively:

- Increased Relaxation
- Better Sleep
- Deep Meditation

- Mindfulness
- Increased Positivity
- Increased Concentration
- Body Healing
- Lower Stress
- Eliminate Anxiety
- Spiritual Consciousness

Due to these benefits it is now widely used (The telegraph. 2014). Generally the youth is getting attached to these beats to study, increase concentration and productivity. Some even say that it is equally powerful as yoga or meditation, although it is not proven yet, binaural beats is an interesting area for more research. Popularity of these beats have burgeoned over time because of these umpteen benefits. These beats can be listened to anytime, anywhere with the help of just a music device and earphones (Zenlama, 2014).

With an analogy to a coin having two sides, there are equal amount of advantages and disadvantages to the usage of these beats.

A. Darker Side – The Digital Drug

Binaural beats are referred to as digital drugs because humans can reach a subconscious state by listening to these beats and supposedly get “high”. The youth is increasingly using these digital drugs to attain a delirious state.

Table 1. Different states of mind (Neurosoup, 2015)

Waves	Frequency Range	State Of Mind
Delta	0.5Hz - 4Hz	Deep sleep
Theta	4Hz – 8Hz	Drowsiness (also first stage of sleep)
Alpha	8Hz – 14Hz	Relaxed but alert
Beta	14Hz – 30Hz	Highly alert and focused

Doser named application has gained much heed because its developers claim that it can simulate specific effects on brain’s mental state with the help of binaural beats, and some of them are named as prohibited recreational drugs (Neurosoup, 2015). This now seems like a small problem but with its increased usage it might be a behemoth point of discussion and stress. Furthermore controlling its widespread usage might become nearly impossible after some years.

Research methodology

While using binaural beats, users should keep following things in mind so that effect on human anatomy can be avoided.

- Listening to these sounds while doing something that requires to be cognitive like driving or operating heavy machinery is not advisable.
- Since it is different frequency based waves identified by brain, makes complexity in decision making capacity.
- These beats are not suitable for individuals below the age of 18 due to age growth.
- Inhaling it for large time causes affect on nervous system which causes low response capability.
- When binaural beats are applied in the contact with other wave based device, it affects strongly on human cardiac and heart system

Conclusion

These beats have proven to be capricious because of its umpteen pros and cons. It’s up to humans whether to use them for inner peace and meditation or on the contrary use these beats as drugs and for forgetfulness.

It has always been the case whenever new things are concocted. It would not be wise to blame the binaural beats because it is up to humans how to use them. Even these beats can be used for specified timings only. Continuously usage causes large effect on human anatomy. These beats has to be used after detailed anatomical study of the user.

REFERENCES

- Center point eResearch institute, 2010. Scientific Research Validates Holosync's Benefits. Available: <http://www.centerpointe.com/articles/articles-research>. Last accessed 15th Jul 2016.
- Juti Naraballobh, Dusit Thanapatay, Jatuporn Chinrungrueng, Akinori Nishihara, 2015. EEG-based analysis of auditory stimulus in a brain-computer interface. Information and Communication Technology for Embedded Systems (IC-ICTES), 2015 6th International Conference of. 1 (1), p1-4.
- Nantawachara Jirakittayakorn, Yodchanan Wongsawat. 2015. The brain responses to different frequencies of binaural beat sounds on QEEG at cortical level. 2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC). 1 (1), p4687 - 4691.
- Neurosoup, 2015. Binaural Beats – An Overview. Available: <http://www.neurosoup.com/binaural-beats-an-overview/>. Last accessed 15th Jul 2016.
- On, F. R., R. Jailani, H. Norhazman, N. Mohamad Zaini. 2013. Binaural beat effect on brainwaves based on EEG. Signal Processing and its Applications (CSPA), 2013 IEEE 9th International Colloquium on. 1 (1), p339 - 343.
- The telegraph, 2014. Student 'addiction' to technology 'similar to drug cravings'. Available: <http://www.telegraph.co.uk/technology/news/8436831/Student-addiction-to-technology-similar-to-drug-cravings-study-finds.html>. Last accessed 15th Jul 2016.
- Todor Mihajloski, Jorge Bohorquez, Özcan Özdamar. 2014. Effects of single cycle binaural beat duration on auditory evoked potentials. 2014 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. 1 (1), p4587 - 4590.
- Zenlama, 2014. Understanding the benefits of brainwaves And Binaural Beats – The Ultimate Quick Start Guide. Available: <http://www.zenlama.com/understanding-the-benefits-of-brainwaves-and-binaural-beats-the-ultimate-quick-start-guide/>. Last accessed 15th Jul 2016.
