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MUSIC TO MY EAR: WILL BE ABLE TO RECOGNIZE THE MUSICAL NOTES BETTER WHEN USING ONLY THE LEFT EAR?

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SUMMARY. Tone deafness refers to a condition where a person is unable to distinguish between different musical notes. Afflicted persons are not able to recognize the difference when 2 different musical notes are played. This inability is not caused by a lack of musical knowledge or training but is instead caused by genetic inheritance or brain damage. Tone deafness is a disability that is shown in music only. People who are tone deaf do not have a problem in recognizing the different intonations in human speech. This disability is also associated with the inability to follow musical rhythms and recognize songs. In this paper, we propose the ability of participants to recognize and repeat the musical notes that they hear. Testing was done using only the left ear, only the right ear, and both ears.

Keywords: Music, Tone Deaf, Genetic Inheritance, Intonation.

Introduction

The ear of the human body is a sophisticated and extremely sensitive organ. The role of the ear is to relay and transduce sound through the parts of the ear into the brain: the outer ear, the middle ear, and the inner ear. Detecting, transmitting, and transducing sound is the key activity of the ear. Maintaining our sense of equilibrium is another incredibly significant function of the ear. The ear is the hearing organ and, in mammals, equilibrium. The ear is commonly defined in mammals as having three parts: the outer ear, the middle ear, and the inner ear. The pinna and the ear canal are composed of the outer ear. Because in most species, the outer ear is the only identifiable component of the ear, the term "ear" also applies to the external part alone. The tympanic cavity and the three ossicles form the

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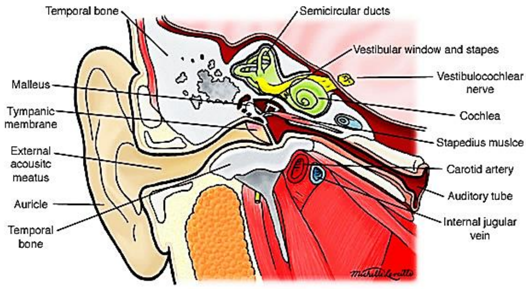
middle ear. In the bony labyrinth, the inner ear includes components that are important to many senses: the semicircular tubes, which allow coordination and eye control while moving; the utricle and saccule, which allow stationary equilibrium; and the cochlea, which allows listening. The ears of the vertebrates are symmetrically located on either side of the head, a configuration that promotes sound localization. The ear is developed from the first pharyngeal pouch and six small swellings that arise in the early embryo called otic placodes, which are derived from the ectoderm. The ear can be damaged by injury, including infection and neurological injuries. Ear infections may lead to hearing loss, tinnitus, and coordination problems such as vertigo, but all these problems may also be caused by brain injury or by neuronal pathways originating from the ear. In various cultures, the ear has been painted for thousands of years with earrings and other gems and exposed to improvements in surgery and makeup. Pressure waves are module from the outside ear from the middle ear and transferred throughout the inner ear to the vestibulocochlear nerve. This nerve transmits information to the brain's temporal lobe and is recorded as sound. Sound that flows into the outside ear stimulates and vibrates the eardrum. Thios vibration is conveyed by the three ossicle bones to another window (the oval frame) shielding the inside ear filled with blood. The outside the earpin helps to intensify a sound that affects the eardrum. The sludge is on the membrane, and the pulse is felt. This sound is conveyed to the oval window via the incus and steps. The tensor tympanum and the stapedius also modulate noise in two small muscles. The two muscles contract reflexively to damp vibrations. The oval window vibration induces the endolymph vibration inside the vestibule and in the cochlea. The inner ear houses the system used to transform sensations from the outside into signals transferred through the middle ear via the vestibulocochlear nerve to the brain. The internal ear's hollow channels are filled with liquid and have a sensory epithel, which is coated with hair cells. The systematic protein filaments that are projected out into the liquid are the microscopic “hairs.” Hair cells are mechanoreceptors that, if activated, activate a chemical neurotransmitter. Sound waves pass through fluid movements to Corti organ receptor cells. Sound waves fluid moves the filaments of single cells and allows the filaments to open to absorb the potassium rich endolymph. This leads the cell to depolarization and induces an activated potentiality distributed through the spiral ganglion that transmits information to the temporal lobe of the brain via the auditory component of the vestibulocochrome nerve. Sounds of frequencies from 20 Hz to 20 kHz (audio range) can usually be heard by the human ear. Sounds beyond the spectrum are called infrasound (less than 20Hz) or ultrasound (more than 20 KHz). While the auditory elements of the central nervous system and a functioning one need to be healthy and functional, human distress (extreme sound sensitivity) most frequently arises due to internal ear disturbances, instead of triggering them in the nerves or parts of the central auditory system.

Figure 1



Anatomy of Ear

According to recent studies, our left and right ears sound distinct. When psychologists examined hearing infants, they observed that the left ear was more musically aligned and that the right ear was better for voice-like sounds. Lead researcher Dr Yvonne Sininger of Los Angeles University and her colleagues published their thesis in Literature, the latest issue of the newspaper. It was understood long ago that the right and related half sound differently during the brain phase, but it was assumed that such variations originated from the cell properties peculiar to each hemisphere in the brain. The new study proposed continuing with the discrepancies. “We have always believed that our right and left ears were functioning the same way,” Sininger said. The researchers have said that the results would help clinician’s increase language learning and voice learning in newborns that are affected by hearing disability, as well as to strengthen the recovery of those with hearing loss. “What's more significant, we have shown that this can have major effects on the speech and language of the child.” With more than 3 000 newborn, particular small amplifiers, Sininger and her colleagues’ researched hearing in the outer hair cells of the internal ear. To intensify sound stimuli, these cells contract and extend, transfer signals to neuronal cells, and send them to the brain. The scientists placed small samples in the baby's ore that produced two distinct sound forms and analyzed intensified vibrations. They found the speech-like click amplification in the rectal ear, while the left ear intensified the music-like lasting tones. “We were puzzled by the fact that clicks caused more distortion in the right ear of the infant, while the tones lead to more intensity in the left ear of the infant," said Jardan. This reflects how voice and music are processed by the brain, except that the sides are inverted due to the cross similarities of the cortex.' Our studies indicate that auditory processing occurs in the ear before it is ever used in the brain' said co-author of the University of Arizona Associate Professor Barbara Cone-Wesson. "The ear is structured even at birth to discriminate between different kinds of sound and to take it to the right location in the brain."

Comparing right and left ears

Our left ears and right ore processes can be used in numerous forms in recent studies. Our left ears appear to listen to popular noise more closely, while the right ears are more attuned to speech noises. This is because the noise from the right ear is channeled to the left side of the brain, while the noise from the left ear is channeled to the right side of the brain, and sound perception is handled differently by our left and right brains.

Results

The required materials for the test:
1. A CD player
2. A CD containing recordings of random musical notes
3. A musical keyboard, organ, or piano
4. A pair of earphones
5. One sheet of small white label
6. One black marker
7. Five pairs of earplugs

1. The independent variable is listening to the musical tone in the left ear only, right ear only, and both ears for this experiment. The vector dependency is the number of right participant notifications remembered. This is calculated by matching the musical notes that were listened to by the participants with a keyboard note. The number of checked notes is the constant (checking variable).

2. To take part in this experiment, pick ten non-musically trained participants.

3. Using white labels and markers to identify all keys on the musical keyboard.

4. Have all those concerned put earplugs in their right ears. Plays ten randomly picked musical notes taken on the CD and then allow participants to listen to the recording with their left ears. When a note is played, ask the

participants to pick the key that corresponds to the note that has just been played on the musical keyboard. Document the correct number of keys each participant has chosen.

5. Repeat stage 4, so with the earplugs in their left ears, and without earplugs, made the participants listen to the CD. List outcomes in a chart, as shown below.

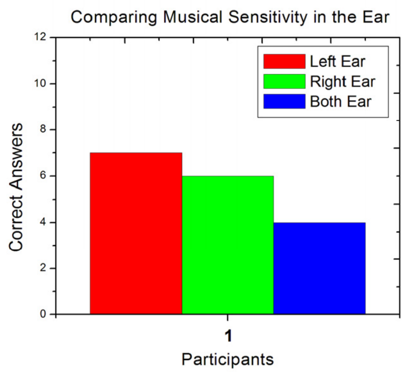
Table 1

Condition	**Number of notes identified correctly**									
	1	2	3	4	5	6	7	8	9	10
Left ear	7	10	4	8	10	9	6	10	7	8
Right ear	6	10	3	6	10	8	4	10	6	7
Both ear	4	10	2	5	10	6	3	10	6	5

Observation

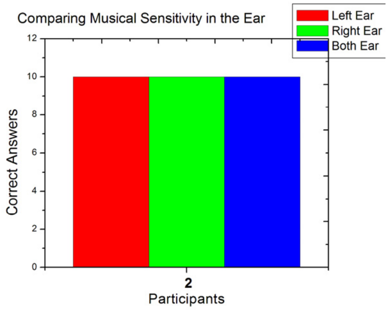
The findings indicate that, as they listened to the CD using only their left eye, the participants were able to hear more musical sounds. It was also noticed that by listening with both ears, 3 participants were able to identify less than 5 musical tones, suggesting that they could be tone deaf. As shown below, the above results were then plotted on a graph.

Figure 2



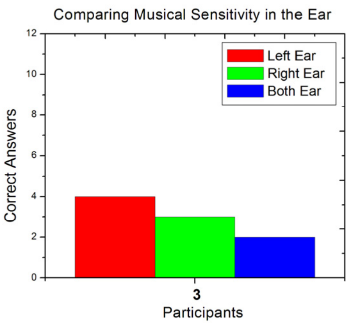
When we tested, we found that the effect of music in this graph is being heard more in the left ear. Therefore, Participant 1 listens to music more in the left ear.

Figure 3



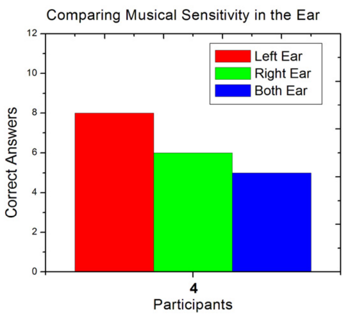
This graph shows that Participant 2 listened to the same effect of music in the left ear, right ear, and both ears.

Figure 4



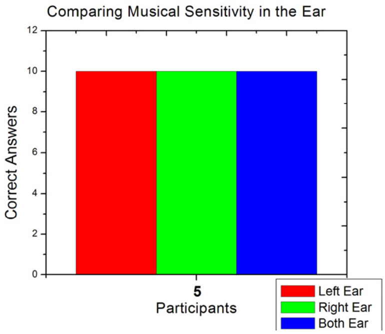
When we tested, we found that the effect of music in this graph is being heard more in the left ear. Therefore, Participant 3 listens to music in the left ear.

Figure 5



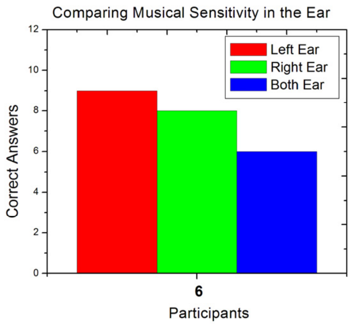
This graph shows that Participant 4 listened to music in the left ear, then right ear, and then both ears.

Figure 6



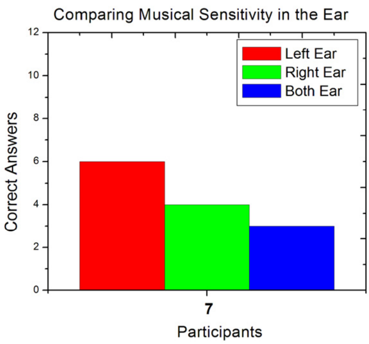
This graph shows that the Participant 5 listened to the same effect of music in the left ear, right ear, and both ears.

Figure 7



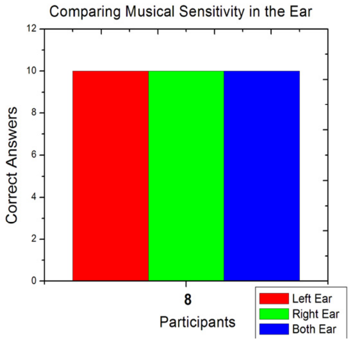
When we tested, we found that the effect of music in this graph is being heard more in the left ear. Therefore, Participant 6 listens to music more in the left ear.

Figure 8



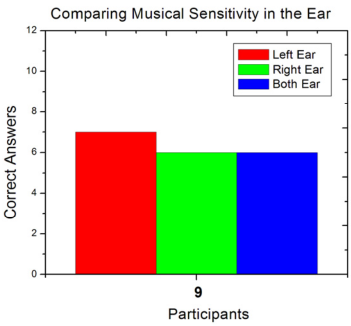
When we tested, we found that the effect of music in this graph is being heard more in the left ear. Therefore, Participant 7 listen to music more in the left ear.

Figure 9



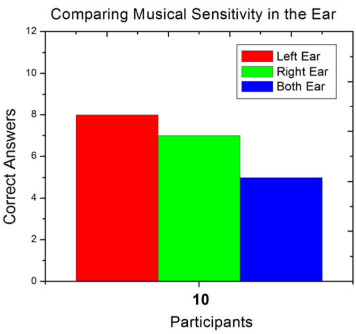
This graph shows that the Participant 8 listened to the same effect of music in the left ear, right ear, and both ears.

Figure 10



This graph shows that the Participant 9 listened to music in the left ear.

Figure 11



When we tested, we found that the effect of music in this graph is being heard more in the left ear. Therefore, Participant 10 listens to music in the left ear.

Conclusion

It has been proved that the theory that the subjects will be able to adequately identify the notes by using only their left ears is correct. For speech and hearing recovery, the finding that our left ears are more attuned to musical sounds while our right ears are stronger at listening to human speech is important. This observation has helped doctors develop speech and listening in children born with hearing impairments and rehabilitate adults with hearing loss.

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Source of funding - Self
Conflict of Interest - Nil

Future Work

In our future work, we try by using Instrumental Music, Raga Therapy, and Body Sensor Networks (BSN) to improve the health of young ladies.

Picture 1

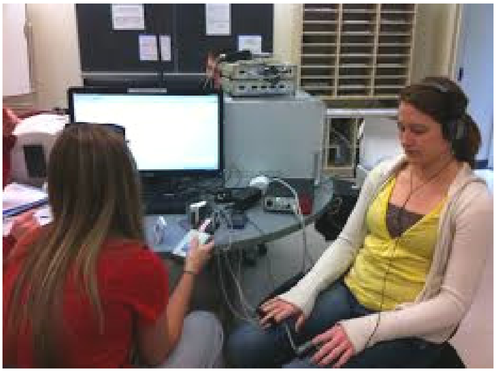
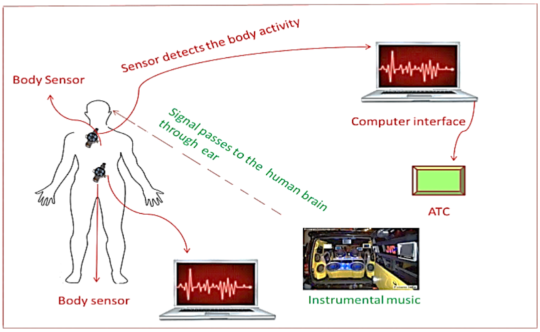


Figure 12



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