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9/28/2023

Lab# 6/7

Bio 125

Sensory Physiology

Purpose:

In today's lab we combined lab 6 and 7 together. We will perform a series of exercises that measure the capabilities of your sensory systems. For example, cutaneous, olfactory, auditory, proprioceptive, and visual systems will be examined to observe basic principles of human sensory physiology.

Procedure:

In lab A-1, Two point discrimination with our partner, we used a two caliper pinpoints as closely together as possible to our palm with the tester's eyes closed. We removed it and moved it 1 millimeter apart. Reapplied until the tester was able to discriminate two separate caliper points. We compared results from our palm, back of hand, fingertip, cheek, and back of the neck. Lab A-2 Accommodation of thermoreceptors we placed our left finger in 15 Celsius degree of water and our right finger in 37 Celsius degree of water and we record the sensation of each after keeping them for 2 minutes. Once, done so we place both fingers in 25 Celsius of water and describe the immediate sensation in each finger. Lab B-1, Olfactory adaptation is where we close our left nostril, and we uncork and hold a bottle of camphor oil under our nose until we can no longer detect the smell of the camphor. We then record the adaptation time. next, we will hold the peppermint and cloves under our nose distinguish the smells of them. Repeat the same step of camphor under our nose till we cannot distinguish the smell. Record second adaptation time. We unlocked our left nostril and determined the camphor smell if detected. Lab C-1 Tuning fork, this type of test checks for middle ear damage. We hold our hand over an ear while we test the other ear with the tuning fork. We hold the handle of the vibrating tuning fork to the right mastoid process. As the sound disappears, move the fork near the external auditory canal. Reappearance of the sound means no middle ear damage. Then proceed to the other ear to test and record results. Lab C-2, Audiometry, in a quiet room, the instructor will demonstrate the proper method of operating the audiometer. Audiometry tests will be conducted in pairs. Each student will take his/her partner's audiogram. Record your results on the worksheet on page 44. Analyze the audiograms in the following way: a. Average the values obtained for each ear for the frequencies of 500 Hz, 1000 Hz, and 2000 Hz. b. Subtract 26 from each average. c. If the difference is greater than 26, multiply this number by 1.5%. This equals the percent impairment of each ear. To determine the percent of binaural impairment, perform the following calculation: $\text{Binaural impairment} = (\% \text{ impairment of good ear} \times 5) + (\% \text{ impairment of bad ear}) / 6$. Record the results of these calculations. Lab E-1, Demonstration of the blind spot. Covering our

left eye and focus the right eye on the center of the cross below. Slowly bring the page closer to our eye until the spot disappears. Have your partner measure this distance from your eye to the page. The image of the spot is now superimposed on the optic nerve. Explain the lack of vision at this point. Lab E-2, The Snellen test, Stand 20 feet away from the Snellen chart. Covering our left eye and attempt to read the line designated “20”. If you cannot read line 20, attempt line 30, 40, 50, 70, 100 or 200 until a line is legible. Perform these attempts with your left eye, covering your right eye. Visual acuity = Distance you read the letters/Lowest line read clearly at 20 feet. Lab E-3, Astigmatism, we stand approximately 8–10 inches away from the radial astigmatism eye chart so that it fills your field of vision. Covering our left eye. Focus on the lines in the vertical plane with your right eye. If a blur appears in the lateral lines or the lines converge into one, you have an astigmatism in this plane of your eye. Record the results of this test and repeat with the left eye. Lab E-4, Color vision, Negative After-images. Stare at different colored objects provided by your lab instructor for 30 seconds each, and then shift your glance to a white sheet of paper. These may include but not be limited to colored squares on white paper, stripes of various colors against white paper, colored flags or scenic views. Record the negative after-images seen for each color. Were you able to predict any of these? Color-blindness test. Obtain the Ichikawa color blindness charts. Attempt to read the numbers of each pattern on the test panels. (There are some “practice” panels before the actual test panels begin.) After the first 10 test panels, if your score indicates color blindness, continue with the next five test panels to determine which color deficiency exists. Record your results on the worksheet on page 46. Lab E-5, Perimetry we seat yourself before the perimeter board with your right eye at the edge of the semicircle. Cover your left eye. Stare at the centerline. Your lab partner will introduce several different colored blocks into your field of vision. Identify these blocks by color. Don't Take your eye from the center of the chart or uncover your left eye. Your partner will record the degree at which the colors were discriminated against on the perimeter scoresheet on page 47. Repeat these procedures for each block for both the horizontal and vertical perimeter charts. Record the data and connect the same-colored dots to form an outline of cone placement of your right eye on your data sheet. Explain these results regarding cone placement in your retina.

Results:

Lab A-1:

1. palm 2. back of hand 3. fingertip 4. edge of cheek 5. back of neck

Length is measured in (mm)

Myself	Kristal
1. 9mm	7mm
2. 6mm	10mm
3. 2mm	2mm
4. 12mm	2mm
5. 9mm	6mm

Lab A-2:

1. First dip in the water: (15°C) – coldness (37°C)-warm
2. After two minutes in: -cold/numbness -warm
3. When removing hands and being placed in the 25°C water:
(15°C): warm like feeling
(37°C): cooler like feeling

Lab B-1:

Initial adaptation time: 36 seconds

After smelling peppermint oil and cloves: 20 seconds

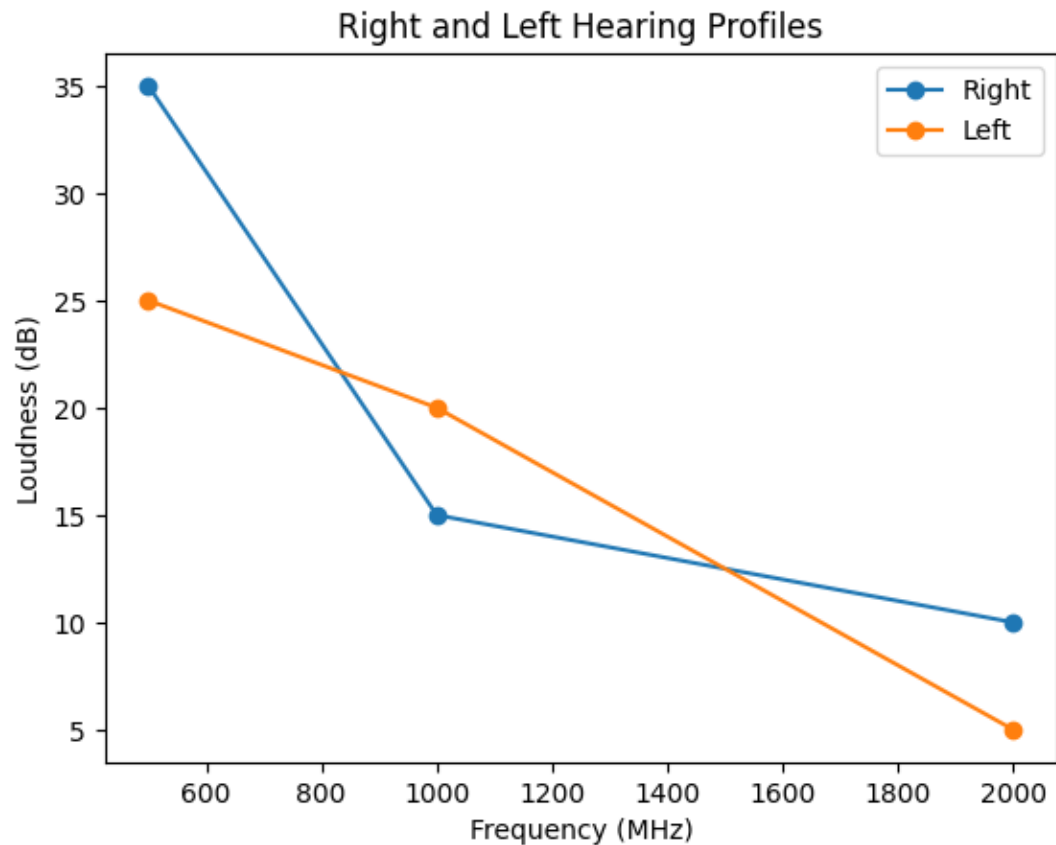
Lab C-1:

No middle ear damages.

Lab C-2:

Right ear	35 dB	15 dB	10 dB	Average: 20
Left ear	25 dB	20 dB	5 dB	Average: 17

Right ear: $17 - 26 = 9$ Left ear: $20 - 26 = -6$ (no percent impairment because it showed negative)



Lab E-1:

Distance from eye to page until blind spot was 22 inches.

Lab E-2:

Eyesight was at 20/100

Lab E-3:

Astigmatism noted.

Lab E-4:

Two-part test. No color blindness and images appeared normal under light.

Lab E-5:

Left to Right	Top to Bottom
• Red -50	• Red -70
• Blue -50	• Blue -75
• Green -50	• Green -60

Right to Left	Bottom to Top
<ul style="list-style-type: none"> • Red -55 • Blue -55 • Green -55 	<ul style="list-style-type: none"> • Red -70 • Blue -70 • Green -70

Discussion:

Sensation is felt differently depending on the site. In our case I felt the most sensation on my fingertips rather than my palms. I think so because our fingertips are more sensitive. The thermoreceptors experiment was interesting. When both hands and finger were placed in the 25°C water, I felt that my hands sensory were opposites. From cold hands to feeling warm and from warm feeling cooler. Mind you they were in the same temperature. Olfactory adaptation was fun, I have a strong sense of smell, so when I first smelled the camphor and went on to smelling the peppermint and cloves to once again back to the camphor it picked up the smell way quickly then the first time around.

Tuning fork tests no discussion available as there was no middle ear damage.

Demonstration of the blind spot, my results were expected, I was not able to see the dot at 22 inches. That is because our optic nerve fiber is passing through the back of your retina inside your eye and not receiving light, leading to a blind spot. The Snellen test, from the beginning of this experiment I knew I would do horrible just because I knew I have bad eyesight. I also knew I had astigmatism, that is why I wear prescription glasses. Nothing to discuss for color-blindness. Perimetry In general I have bad eyes, so my vision is not great whatsoever.

Conclusion:

Overall, these experiments were fun to do A few experiments were straight forward and others were interesting. I was mainly interested in the visions ones just because I already knew my vision was bad but not as bad. The one that stood out the most was the thermoreceptors. This one stood out the most because our hands are sensitive and are the main part of our body that we use.