Laboratory 6/7 - Sensory Physiology

Purpose:

The main purpose of Lab 6 and 7 is to have a better since of the 5 different sensory senses we have. We will be monitoring the environmental stimulation which includes the three basic components of the nervous system; Receptors, Sensory Neurons, and Interpretation centers. We will be activating by using touch, smell, taste, hearing, and sight. Each of these receptors generate a graded potential, which will depolarize connecting sensory neurons.

A-1: Two-point discrimination

Procedure:

1. Apply two caliper pinpoints as closely as possible on your partner's skin on the palm of his/her hand
2. Remove the pins and move them 1 millimeter apart. Reapply the caliper points to your partner's skin.
3. Repeat this procedure until your partner can distinguish two distinct points.
4. Repeat steps on the palm of the hand, back of hand, fingertip, outer edge of the lips, back of neck
5. Have your partner repeat this experiment on your skin.

Results:

Area:	Measurement:
Palm of hand	10 mm
Back of hand	21 mm
Fingertip	4 mm
Outer edge of the lips	8 mm
Back of neck	18 mm

Discussion:

In this section we tested touch, we were poked with a caliper pinpoint until we were able to distinguish when they were separated.

A-2: Accommodation of thermoreceptors

Procedure:

1. Place your left fingers in 15 C water and your right fingers in warm water (37 C) and record the sensation of each. Keep hands immersed for 2 minutes.
2. After two minutes, describe the sensation in each hand.
3. Remove hands and promptly place them both in 25 C water.
4. Describe the immediate sensation in each hand

Results:

My left hand was warm and right hand was cold. It’s a phasic receptor because it was sensitive to change of temperature.

Discussion: when the hands were swapped, the hand that went from hot to cold water created a more uncomfortable feeling almost like numbness. And my partner's hand remained red for a bit even after being out of water for a while.

6/7-B: Olfactory adaptation

Procedure:

1. Block your left nostril. Uncork and hold the bottle of camphor oil under your nose until you can no longer detect the camphor.
2. Remove the camphor and place the bottles of cloves, then peppermint oil under your nose. Distinguish the smells of cloves and peppermint oil.
3. Uncork and hold the bottle of camphor under your nose again until the smell is no longer recognized.
4. Unblock your left nostril to determine if the camphor is detected.

Results:

Camphor oil:	10 sec
Peppermint oil:	4 sec
Cloves:	8 sec

Discussion:

Peppermint oil is the first one that took the least time to be able to keep smelling the oder, next came the cloves at 8 seconds and lastly camphor oil that took the longest at 10 seconds.

C-1: Tuning fork tests

Procedure:

1. Plug your left ear with cotton or hold your hand over it and test the right ear.
2. Hold the handle of a vibrating tuning fork to the right mastoid process.
3. When the sound disappears, move the fork near the external auditory canal.
4. Reappearance of the sound indicates no middle ear damage.
5. Repeat the test with your left ear
6. Record the results for each ear

Results: For both of my ears there was no sign of middle ear damage for me nor my partner for each of our ears.

Discussion: Luckily in this experiment my partner and I showed no sign of ear damage however we were able to figure out that her ears were a lot more sensitive than mine. For her she couldn’t stand the sound it made her body cringe meanwhile it wasn’t a problem for me at all.

C-2: Audiometry

Procedure:

1. In a quiet room, the instructor will demonstrate the proper method of operating the audiometer.
2. Audiometry tests will be conducted in pairs. Each student will take his/her partner's audiogram.
3. 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 dB 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.

Results:

Discussion: No data recorded.

E-1: Demonstration of the blind spot

Procedure:

1. Cover your left eye and focus the right eye on the center of the cross below.
2. Slowly bring the page closer to your eye until the spot disappear
3. Have your partner measure this distance from your eye to the page.
4. The image of the spot is now superimposed on the optic nerve. Explain the lack of vision at this point

Results: The distance from my eyes to the page was 13.3 cm.

Discussion: For the blind spot test it was difficult to figure out at first and to get an accurate measurement for the blind spot but then I was able to measure mine as 13.3 cm.

E-2: The Snellen tests

Procedure:

1. Stand 20 feet away from the Snellen chart. Cover your left eye.
2. Attempt to read the line designated "20".
3. 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.

Results: Person 1: 15ft/20ft Hyperopia Person 2: 20ft/20ft Normal

Discussion: In this experiment I had an outcome of normal results, but my lab partner ended up having hyperopia. This may be due to me not needing glasses, but my partner wears prescribed glasses.

E-3: Astigmatism

Procedure:

1. Stand approximately 8 –10 inches away from the radial astigmatism eye chart so that it fills your field of vision. Cover your left eye.
2. Focus on the lines in the vertical plane with your right eye.
3. If a blur appears in the lateral lines or the lines converge into one, you have an astigmatism in this plane of your eye.
4. Record the results of this test and repeat with the left eye.

Results:

8-4 the blurry lines were the cross over lines

E-5: Perimetry

Procedure:

- Seat before the perimeter board with your right eye at the edge of the semicircle. Cover left eye and stare at the center line.
- Your lab partner will introduce several different colored blocks into your left field of vision. Identify blocks by color.
- Your partner will record the degree for each block for both horizontal and vertical perimetry charts. Record the data.
- Explain results.

Results:

	Flag from left:	Flag from right:	Flag from above:	Flag from below:
Red:	70	70	60	40
Green:	70	70	60	40
Blue:	70	70	60	40

Conclusion:

In this lab we were able to get a better understanding of our 5 senses, touch, smell, vision, smell, and auditory. This lab helped us understand which of our senses need some help in, like in vision, some people may need glasses. Others may have some trouble in the auditory section, and some may not have the best sense of smell.