LABORATORY 6/7–SENSORY PHYSIOLOGY

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Purpose:

In this laboratory, we performed a series of exercises that measured the capabilities of our sensory systems. Cutaneous, olfactory, auditory, proprioceptive, and visual systems were examined to observe basic principles of human sensory physiology.

Procedures with Results:

A-2: Accommodation of thermoreceptors

Procedure

1.Place your left fingers in 15C water and your right fingers in warm water (37C) 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 25C water. Describe the immediate sensation in each hand.

Results:

Fingers in the cold water hurts and feels like a burning sensation and when you place right and left fingers in the 25 degree celsius water the fingers that were in the cold feel hot and the fingers that were in the warm feel cooler.

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. Do not consciously sniff the contents of the vial! Record the adaptation time.
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. Record this second adaptation time
4.Unblock your left nostril. determine if the camphor is detected.
5.Interpret these results.

Results:

The camphor oil smell first was completely gone after a minute 13 seconds but the second time after smelling the cloves and peppermint oil the smell of camphor oil was completely gone after

a minute 3 seconds. Once the smell was gone and the left nostril was unblocked the camphor oil was detected.

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:
The sound reappeared after being brought up to the auditory canal which means no internal damage.

D: Equilibrium -Demonstration of Nystagmus
Procedure
1.A student volunteer will be seated on a swivel stool with his/her head bent 30 degrees forward.
2.The instructor will spin the student rapidly to the right for 10 turns.
3.The instructor will suddenly stop turning the student and have the student look straight ahead.
4.Observe and note the subsequent movement of the student's eyes
5.Explain these eye movements in terms of direction of endolymph movement.
6. These procedures will be repeated with a second student spun to the left.

Results:
The students' eyes seem to continue moving left and right rapidly even after they have stopped spinning.

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 disappears.
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:
Someone else told us there was a point where the spot disappeared, but neither of us could find it and we were able to see it at all times.

E-2: The Snellen test

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.
4.The Snellen chart is analyzed in the following way:
Visual acuity = Distance you read the letters/Lowest line read clearly at 20 feet

Results:

For Jasmin and Cass, it was 40 at 20 feet.

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:

Neither of us have astigmatism.

E-4: Color vision

1. Negative After-images

Procedure

1.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.
2.Record the negative after-images seen for each color. Were you able to predict any of these

2. Color-blindness test

Procedure

1.Obtain the Ichikawa color blindness charts.
2.Attempt to read the numbers of each pattern on the test panels. (There are some “practice” panels before the actual test panels begin.)

3.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.
4.Record your results on the worksheet on page 46

Results:
We both saw pink circular objects from one photo. Then, we saw pin diamonds with a white empty space. On a different one, we saw the blue and orange inverted. For the Ichikawa charts, we were able to read all the numbers.

E-5: Perimetry

Procedure

1. Seat yourself before the perimeter board with your right eye at the edge of the semicircle. Cover your left eye. Stare at the center line.
2. Your lab partner will introduce several different colored blocks into your field of vision. Identify these blocks by color. Do not take your eye from the center of the chart or uncover your left eye.
3. Your partner will record the degree at which the colors were discriminated on the perimetry score sheet on page 47.
4. Repeat these procedures for each block for both the horizontal and vertical perimetry 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.
5. Explain these results in regards to cone placement in your retina.

Results:

For Jass

Color	Flag from left	Flag from right	Flag from above	Flag from below
Red	50°	40°	80°	65°
Green	55°	30°	85°	60°
Blue	55°	25°	75°	70°

For Cass

Color	Flag from left	Flag from right	Flag from above	Flag from below
Red	55°	55°	95°	60°
Green	42°	40°	75°	80°
Blue	55°	60°	85°	65°

Discussion:

When we tested our sensory system they reacted in a way we expected except smelling the oils. When we plugged our left nose and finally unplugged the nostril, we were fully expecting it to be accustomed to the smell because the right nostril was used to the smell. However, it was not and it still took time for it to get used to it even though with the other nostril it was fine. This showed us that our nostrils, although both the same sense, worked separately and were two different things.

Conclusions:

In conclusion, it was clear that by performing the different exercises, we were able to see the capabilities of our sensory system. We were able to perform different exercises with different sensories and see how it worked and how it reacted to the different exercises.