Jonathan Quang 12/22/2014  
Biology - Ms.Prabhu

Lab #11

Part I Receptors for Orientation in Space Observations  
a)Person B observed that while Person A had his eye closed, Person A had no trouble staying still. There was barely any muscle movement. While Person A's eyes were open, Person A once again had no trouble staying completely still.  
b)Walking in a straight line with the eyes open posed no troubles. Movements were smooth and confident. However, walking in a straight line with the eyes closed was slightly different with the eyes closed. Movements were only a little more rough and a little less unsure.  
c)No disorientation was felt when touching the nose with both arms outstretched with the eyes open and closed.  
d)The black pair of goggles were used. The black color represents the effect of alcohol when it is at a BAC of .08 to .15. This is the range at which a person is considered legally drunk. Person A could not walk under the influence that well. Halfway across the line, Person A started veering off to the right. Person B also did not fare as well. Person B started to veer off course in the same manner at roughly the same area.   
Person A's ability to catch and throw the ball with the goggles on was abysmal. Person A consistently failed to catch the ball the first four times. However, Person A did manage to catch the ball the fifth time. Person A completely missed when throwing the ball to Person B. Person B only caught the ball once out of the five times out of pure luck when catching the ball from Person A.  
Similar to Person A's, performance, Person B's ability to catch the ball with the goggles on was abysmal. Person B consistently failed to catch the first four times, but caught the fifth time out of pure luck. In contrast to Person A, Person B's throwing ability was not that bad. The first 3 throws were low throws that failed. However, the fourth and fifth throws were lucky and perfect respectively. Person B had adapted to the goggles by the end of the fourth throw.

Part I Receptors for Orientation in Space Summary Questions  
1a)Answered above  
1b)The orientation and ability to perform each space activity is related to the function of the proprioceptors. Proprioceptors allow the human body to know where its body parts are and how they are oriented. Even with the eyes closed, the proprioceptors are working properly. The body knows where things are. However, when the drunk-simulation goggles were brought in, the ability of the body to know where it is was diminished. What the eyes saw through the goggles did not match with the information the proprioceptors were giving. This leads to the disorientation and lack of hand-eye coordination observed in the experiment.

Part II. Skin Receptors for Pressure and Temperature Observations

Part data for parts a, b, and c are in the table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Distance at which the pins could be distinguished as separate | Person A | Person A with Cold Pins | Person B | Person B with Cold Pins |
| On the Forearm | 2.5 cm | 1.6 cm | 2 cm | 2 cm |
| On the Back of the Hand | 0.3 cm | 0.5 cm | 2 cm | 1 cm |
| On the Front of the Hand | 0.7cm | 0.5 cm | 0.3 cm | 0.3 cm |
| On the Finger | 0.2 cm | 0.1 cm | 0.1 cm | 0.1 cm |

b) In Person A, the cold pins decreased the distance between the nerves for most of the sites tested except the front of the hand. The nerve distance actually increased by 0.2 cm. In Person A and B, the nerves were the closest on the fingers, but the farthest away from each other at the forearms.

c)In Person B, the cold pins had almost no effect on the nerves except for the back of the hand. The results are supposed to be that the nerve distance decreases. This disturbance in the data may be attributed to the fact that the pins were not adequately cold enough.

Part II Skin Receptors for Pressure and Temperature Summary Questions.

2a) Check observations above.  
2b)Check observations above. The data suggests that the pins were not adequately cooled when testing Person B. The cold is supposed to make the body more sensitive.   
2c) The distribution is adaptive because the purpose and size of the body part matches how sensitive it is. Fingers and the front of the hand tend to be more sensitive because they are used to fell objects. The back of the hand is generally not used to feel objects, so it is less sensitive. The forearm is the least sensitive because of its sheer size and the fact that it is not used to fell. This suggests that the touch receptors on a human's back are more spread apart because they are not used to feel objects and the back is bigger.

Part III: Taste and Smell Observations

1. While Person's A eyes were closed and his nose pinched, Person A was given an apple, apple, and a slice of a potato. Person A was able to identify all correct except the second apple.  
2.With Person's A eyes closed but nose not pinched Person A was fed an apple, apple, and a slice of potato in that order. Person A was able to identify all three correctly. Person A's ability to distinguish between an apple and a potato was diminished with his nose pinched.  
3.Person B was given a potato, potato, and apple in that order with his eyes closed and nose pinched. Person B was then given a potato, apple, and potato. Person B was able to identify the food perfectly.

Part III: Taste and Smell Summary Questions  
3a) Observations are recorded above.   
3b) The partner is asked to administer the various touch, taste, and smell tests instead of yourself because knowing what you will be tested on grantees you the answer. For example, if you fed yourself a potato, you would know it is a potato.

Part IV: Vision Observations

In the colorblindness test, both Person A and Person B were able to identify all the numbers in each circle, 25, 29, 45, 56, 6, and 8.  
In the visual acuity test, both Person A and Person B demonstrated similar reading abilities. Until the second to last row, all letters were identifiable without guessing.  
In the five optical illusions observed, they played with our minds. In optical illusion 30, it was observed that the middle bar seems to be both vertical and diagonal, which upon further investigation, should be impossible. Imagining it in 3D also did not work.  
In optical illusion 31, the 3 lines are intersecting a 2d glove, but connecting to the glove does not actually make sense.  
In optical illusion 1, both people were fooled. The vertical bar was mistook to be longer than the horizontal bar, but both are actually equal in length.   
In optical illusion 4, the 4 parallelograms are organized in such a way that it looks like two plates intersecting each other. However, when looked at a different angle, it looks as if the plates are intersecting in a different way.  
In optical illusion 2, the extension did not look like an extension of the object on the left, but in reality is.

Part IV: Vision Summary Questions  
4a) Check observations above.  
4b)Check observations above.  
4c) In the Stroop test, the response time was 13.15 seconds for reading 25 words whose meaning matches the color they are. The response time for reading 25 words whose color did not match the meanings took 24.825 seconds. The difficulties for reading the last resulted from the fact that it is much easier to say the color the word spells out than rather the color the word actually is. This is attributed to the fact that the brain uses less mental resources identifying the meaning of the words than identifying colors.

Part V: Summary

a) The results for each of the sense test were similar to that of my partner. However, my partner tended to fare better in the tests. Other classmates also reported the same results, some performing only slightly worse than I, and others performing like my partner.