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Lab 5: Electroencephalography and reaction time

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Purpose: The purpose for this experiment was to demonstrate one's action potential velocities and synaptic delays in complex visual and auditory reflexes, as well as the diversity of reactions. Not everyone has the same reflexes, so we tested ourselves and someone else to compare our reaction time.

Procedure:

5-A) Recording visuals reaction times

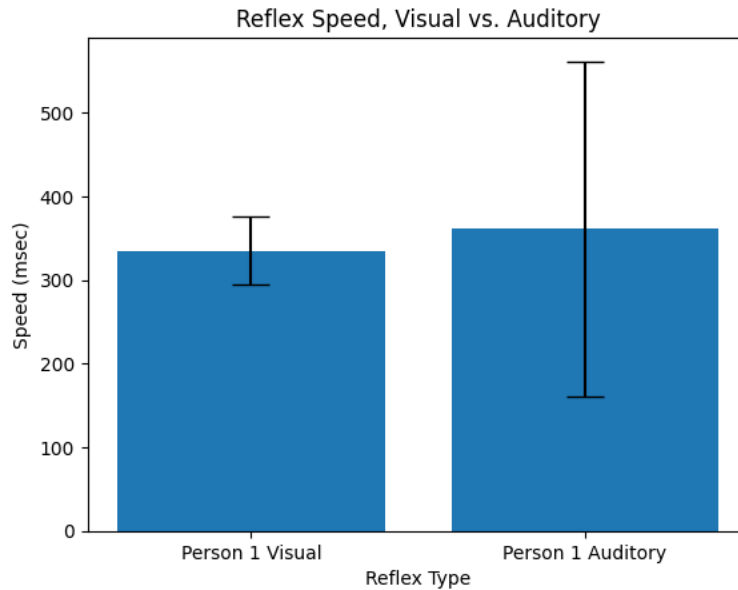
1. Before turning anything on, the IWX/214 unit is plugged in. EM-100 Event Marker is fully connected to the Channel 3 socket in front of the IWX/214 unit. Turn on laptop allowing it to boot up, the USB chime from the laptop if the laptop does not default to mute.
2. Open the labscribe 3 program, as the program opens window pop-up that say **"Hardware found IWX214:2008-1-24"** click okay.
3. In the second from the top row (the row that says, "File Edit View Tools Settings Advanced External Devices Help"), click on the "Settings" tab. Click on tab "Human Nerve" then leads to second tab "Auditory- VisualReflexes". Close pdf tab.
4. Pair up with partner and have them face in a chair facing the computer where they can easily press the "Enter" key. Partner holding the EM-100 Event Marker should stand out of sight and quietly press button.
5. Type the subject's name and "Visual" in the Mark box. Click Record" button then click the Mark button; this will put a vertical line in your recording and the words in the Mark box at the bottom of the vertical line. Leave the cursor mouse over the Mark box.
6. Each time the lab partner quietly clicks the Event Marker button, the green line coming in from the right side of the computer screen will jump up then back down. As soon as the subject sees the green line jump up, they need press the "Enter" key as quickly as possible. The subject will have to hit the "Enter" key twice for every trial: once to leave the Mark line and a second time to clear the "Enter Mark Text" pop up window.
7. Repeat this for ten trials but the lab partner should be sure to click the Event Marker button at irregular intervals (not less than 5 seconds apart, but not more than 10 seconds apart). After ten trials click the "Stop" button (it's the same button that turns from the red "Rec" button to the black "Stop" button once it is recording).
8. Multiple lab partners can use the same Iworx file. Just click the red "Rec" button again and let a good 20 seconds of flat line go by before you click the black "Stop" button. Then repeat steps 5-7 above with the new subject's name. If a third student will be using the same file, just click the red "Rec" button again and let a good 20 seconds of flat line go by before you click the black "Stop" button. Then repeat steps 5-7 with the third student's name.

9. Once all lab partners have made their Visual Cues recording, go back to the first of ten trials for each student. Move the red cursor lines (there are two) by left clicking on the red cursor line and while holding down the left mouse pad button, sliding your finger on the mouse pad to move one red cursor line to the left base of the green rectangle, then releasing the left mouse pad button. Move the other red cursor line to the black Mark line.
10. Look at the top right of the screen where it says " $T2 - T1 = \text{___ msec}$ ". Record that number and repeat this step for all ten trials and for each of the students using your laptop. Calculate the average for the ten trials. Report these numbers to the lab instructor who will compile the class numbers.

5-B) Recording auditory reaction time

1. Turn the laptop so the subject can still press the "Enter" key but cannot see the screen. The subject's hand should be in a position so that they can press the "Enter" key as quickly as possible. The lab partner holding the EM-100 Event Marker close to one of the subject's ears should stand out of sight of the subject.
2. Type the subject's name and "Auditory" in the Mark box. Then click "record".
3. Each time the lab partner clicks the Event Marker button near the subject's ear, the click should be audible to the subject. As soon as the subject hears the "click," they need press the "Enter" key as quickly as possible.
4. The subject will have to hit the "Enter" key twice for every trial: once to leave the Mark line and a second time to clear the "Enter Mark Text" pop up window.
5. Repeat this for ten trials but the lab partner should be sure to click the Event Marker button at irregular intervals. After ten trials, click the black "stop" button.
6. Multiple lab partners can use the same Iworx file. Just click the red "Rec" button again and let a good 20 seconds of flat line go by before you click the black "Stop" button between each student.
7. Once all lab pairs have made their Auditory Cues recording, repeat Steps #9-10 of 5-A to analyze the data. Be sure to report the average of the ten auditory trials to the lab instructor.
8. Discuss the class results for both 5-A and 5-B. Does your lab show a normal bell-shaped curve? Why or why not? What accounts for the diversity seen in reaction times?

Results:



Discussion: When we first started working on this experiment it took my partners and myself a good amount of time to get the cables in the right place and getting the right program to use. I think the parts we mostly struggled on was the program set up and getting a good reading, so it took us a good twenty minutes to figure that out. After that we were able to get each other's readings and took turns switching positions. When we got all our data, we created a graph which showed our findings. Collecting the data was easy compared to making the graph. I still have some trouble making graphs, so it takes me while to get my work done. Overall, this experiment was interesting to do.

Conclusion: In conclusion, we got to learn how not everyone has the same reaction times. We understand the concept of action potential velocities and synaptic delays can be different when you consider genetic factors. While using the EEG we got to see how one's brain wave differs from others when we tested each other on our reaction time.