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Laboratory 5- Electroencephalography & Reaction Time
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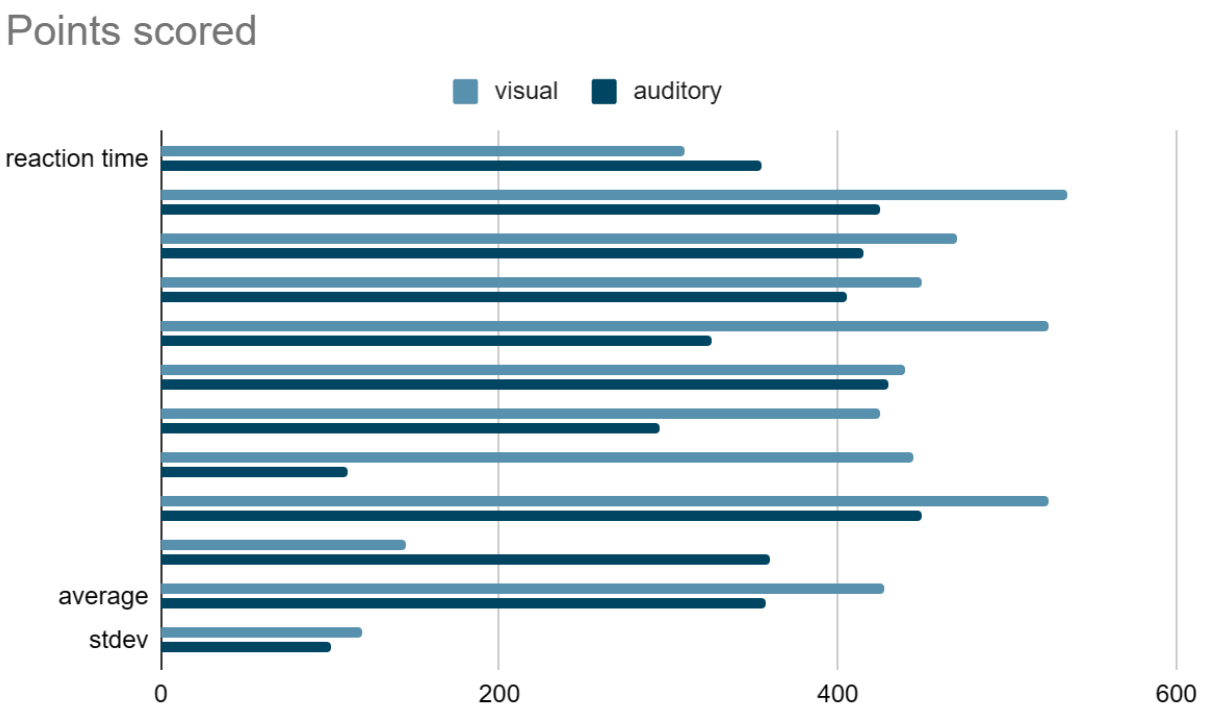
Purpose – The purpose of laboratory 5-A and 5-B, we demonstrated the concepts of action potential velocities and synaptic delays in complex visual and auditory reflexes, as well as the diversity of reactions times found with your partners. The time it takes to complete a simple monosynaptic reflex is dependent on the action potential velocities of the two neurons and the short time delay that always occurs at synapses. Not everyone has the same reaction time. Some people have quicker reflexes than others and this can be explained by their genes giving them larger diameter axons and higher percentages of myelinated axons and fast twitch skeletal muscles and we demonstrated that between me and my partners, our numbers were quite different.

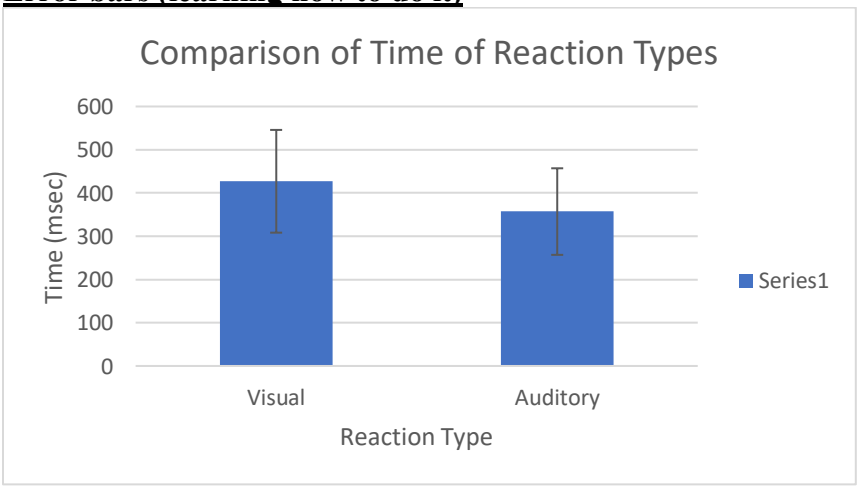
Procedures – Laboratory 5-A Recording Visual Reaction Time, was to understand the basic EEG patterns and know their amplitudes and frequencies as well as the areas responsible for generating different brain waves. To get started with the lab we had a suitcase looking thing on our table that had all the materials we needed. We started off by connecting the IWX/214 to the computer. We connected the EM-100 Event Marker to the channel 3 socket in front of the IWX/214. Once everything is in place and connected, first turn on your laptop, once it's booted up turn on your IWX/214 unit. Once the Iworx unit is on the red indicator light unit should light up and hear the USB chime from the laptop. We then open the Labscribe3 program, as soon as the program opens you should see a window pop up that says, "Hardware found IWX214:2008-1-24" and just click ok. Once you're on the document, in the second from the top row (file edit view tools settings advanced external device help) click on the settings tab. You then click on "Human Nerve" then click on "Auditory-visual reflexes" and close the pdf file that pops up. We pair up with our lab partners, one of us must sit facing the laptop with their hand in the position where they can press the "Enter" key. The other one has the EM-100 marker that should be placed out of sight for them. Once the test begins quietly press and release the button. On the Mark box that is on the right make sure to write your partners name and press the record button. Each time you press the the event marker the green line coming in from the right side of the computer screen will jump up and then back down. As soon as your partner sees the green line, they must press the enter key as fast as they can. Your partner will have to press the enter key twice every trial. Repeat this for ten trials but make sure to press the the event marker (the button) irregularly intervals (less than 5 seconds apart but no more than 10 seconds). After the ten trials have passed stop recording. Multiple lab partners can use the same Iworx file just make sure to press the record button and let run for 20 seconds so you don't confuse your work. Make sure to repeat all steps for your partner. Once all partners have made their visual cues recordings, we go back to the first pf ten trials for each of us. Move the red cursor lines, there should be two. By clicking on each red line, use your mouse on your laptop to move the red line to the base of the green rectangles present then the second red line you move it to the black "mark line". At the top right corner of the screen where it says "T2-T1"= ____ sec. You record that number for example "450msec, 320msec, 150msec" and repeat this step for all ten trials and for each of your partners. For laboratory 5-B is it fairly the same steps just this time you will be turn the laptop away from your partner so they cannot see the screen nut make sure they can still reach the "Enter" button and press it as quickly as possible. The partner holding the EM-100 event marker

(the button) will hold it close to their partner's ear and stand out of sight. You repeat this process for ten trials and keep track of your results.

Results



Error bars (learning how to do it)



Discussion – Laboratory 5-A and 5-B were very similar. I really liked these two labs because they were quick and simple. The only part that took quite some time was setting up the whole device and connecting it to the computer. Professor Oak gave us two options, one was using the device in lab or the other one was online. I tried both and it seemed that the one online was way easier and faster. Lab 5-A and 5-B results make a lot of sense. My partners and I had to press the enter key on the laptop as quickly as possible once you saw the green like pop up. We also had to do the same steps but for lab 5-B just facing away the laptop and only listening to your partner pressing the button. The results for these two experiments were a little different, the numbers for one were smaller than the other. The reason the numbers were different was because for 5-A you were able to see the line pop up right away which made it easier and for 5-B you had to listen carefully, and in my opinion, it was hard to hear my partner press the button which made a delay in pressing the enter key on the laptop. Not everyone has the same reaction time, some may have faster reflexes than others and be able to press on the enter key quickly or slowly. I enjoyed this lab because I had done it before, so I was very familiar with it and plus it as easy. The only difficult part for me was making the error bars and graphs for it. I am still getting used to using excel and spread sheets, but I know that with time I will get better and faster. Errors that could have been made were not setting up the device correctly and not moving the two red lines on the bar and marked line. Other than that, the procedures were very straight forward, and anyone would be able to follow them.

Conclusion – All in all, for lab 5-A and 5-B we demonstrated the concepts of action potential velocities and synaptic delays in complex visual and auditory reflexes, as well as the diversity of reactions times found with your partners. In these two very similar labs the results were fairly the same due to the quickness of us hearing and seeing the rectangle popping up. Laboratory 5 was probably by far one of my favorite labs to do because you are testing your brain, hearing, and eye

site. This can probably be explained by population genetic factors, as genes can influence things such as axon diameters, axon myelination, and the percentage of fast-twitch muscle fibers in a person's skeletal muscle.