Delanie Duran
Tuesday Lab
09/11/23

Laboratory 5- Electroencephalography & Reaction Time

Purpose: The purpose of this lab is to record visual reaction times to implement how normal electroencephalogram (EEG) patterns are shown. The predominance of a particular wave pattern will depend upon several factors including electrode placement, mental state, wakefulness, and activity of the subject. There are many different disorders that can be recognized with their characteristic EEG patterns. For example, Petit Mal epilepsy has a fast wave with a spike and Subdural hematoma has a severe voltage reduction of wave patterns.

Procedure: First step is to make sure the IWX/214 unit is plugged in and that it is connected to the laptop by USB cable. The EM-100 Event Marker should be fully connected to the Channel 3 socket which is in front of the IWX/214. After everything is connected properly, turn on the laptop and allow it to fully reboot before turning the on switch on for the IWX/214 unit. The red indicator light will light up or the USB might chime once the Iworx unit is on. Open the Labscribe 3 program and a window should pop-up saying “Hardware found IWX214:2008-1-24” and click “OK.” If a window pops-up for installing new hardware, shut off the computer and try again from step 1. 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. Down the drop-down window, there should be a tab called “Human Nerve.” Once clicked on, there should be another tab after called “Auditory-VisualReflexes,” which you click on and when a pdf file automatically opens, you don’t need it. This will take two partners, as one will sit facing the computer with their hand positioned on the “Enter” key so they can press it as fast as they can, while the other partner will be holding the EM-100 Event Marker and should stand out of sight to be able to quietly press and release the button of the Event Marker. The subject’s name and “Visual” should be typed in the Mark box. Click the red button “Record” and 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. Everytime the lab partner clicks the Event Marker button, the green line coming in from the right side of the computer screen will jump up, they need to press the “Enter” key as quickly as possible. 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. If multiple lab partners are using 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 “Stop” button. Then repeat the steps above starting with typing the subject’s name and “Visual” in the Mark box and start recording. After all lab partners have made their Visual Cues recording, return back to the first ten trials and move the red cursor lines by holding down the left touchpad button. One red cursor line should be to the left base of the green rectangle, and the second one should be on the black Mark line. At the top right of the screen it says “T2-T1.” Record those numbers with each trial and calculate the average for the ten trials.

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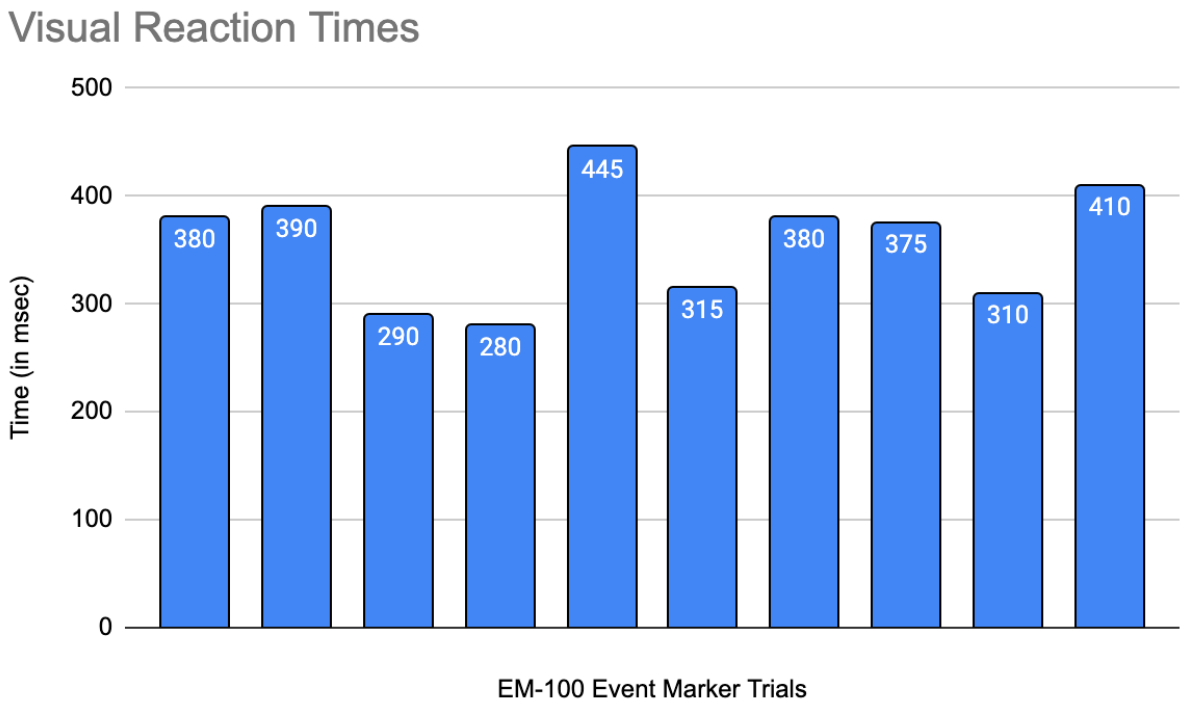
Results:



Discussion: In this lab, we examined an example of visual reaction times to mimic how electroencephalogram (EEG) patterns are shown. We had a hard time setting up the hardware which is why we were short of the auditory reaction times, which would have definitely been interesting to compare. Personally, I believe that my visual reaction time is much faster than my auditory visual time. My visual reaction times were all pretty similar to each other with the lowest being 280 msec and the highest being 445 msec. My average between the ten trials is 357.5 msec. It's quite interesting how the analysis of EEG patterns work and how important they are to be able to diagnose or recognize abnormal EEG patterns. It would be interesting to analyze these tests on individuals with pathological disorders and see the different characteristics of patterns. My sister was recently diagnosed with Focal epilepsy after she had a random seizure around 2 years ago. We found out that it was due to her left hippocampus being smaller than the right side. Also when she was little, she supposedly had absent seizures that we never knew about. Unfortunately her recent seizure messed up her eyesight and her long-term memory. She was also diagnosed with hypometabolism which is decreased brain glucose consumption.

Conclusion: In conclusion, in this lab we recorded visual reaction times that implement how EEG patterns work and how they differ depending on the individual and if they have a neurological disorder or not. The predominance of a particular wave pattern will depend upon several factors that include: electrode placement, mental state, wakefulness, and activity of the

subject. We did ten trials per lab partner and measured the speed of when their brain recognizes the line entering the screen to tell their visual reaction times. We then had to measure the start of the line to when the subject actually recognized and hit the “Enter” key. Measured in milliseconds is how we measured how fast it took the subject to see the line and hit the “Enter” key. My trials were all pretty close in range, going from 280 msec to 445 msec.