

## **Title: Laboratory 5 Electroencephalography & Reaction time**

**Purpose:** Recognize the fundamental EEG patterns and be familiar with their frequencies and amplitudes. Recognize the regions of the brain that produce various brain waves. Recognize the clinical value of EEGs in the diagnosis of neurological conditions. Recognize the basic phases of sleep. able to differentiate between Paradoxical (REM) Sleep and Slow Wave sleep. Recognize the variables that affect how long a reflex takes to complete. Recognize the differences between polysynaptic and monosynaptic responses and the reasons behind their varying velocities. Recognize the typical distribution and range of reaction times in sufficiently large samples, as well as the types of factors that contribute to these distributions.

### **Procedure: 5-B**

1. Once all students using your Iworx unit and laptop have reported their 5-A averages, arrange yourselves for 5-B according to this recording setup:
  - Turn the laptop so the subject can still press the "Enter" key but cannot see the screen. The subject's hand should be in 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 that is to the right of the Mark Button just above the data recording. Then Click the red "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 (not Mark button).
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. Like in 5-A, when this happens a small "Enter Mark Text" window will pop up, ignore it. However, the subject will have to click on the "Enter" key again to clear it. Do not worry, the Mark line will still be in the right place. 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 (not less than 5 seconds apart, but not more than 10 seconds apart). After ten trials, click the black "Stop" button.
6. Like in 5-A, 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-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?**

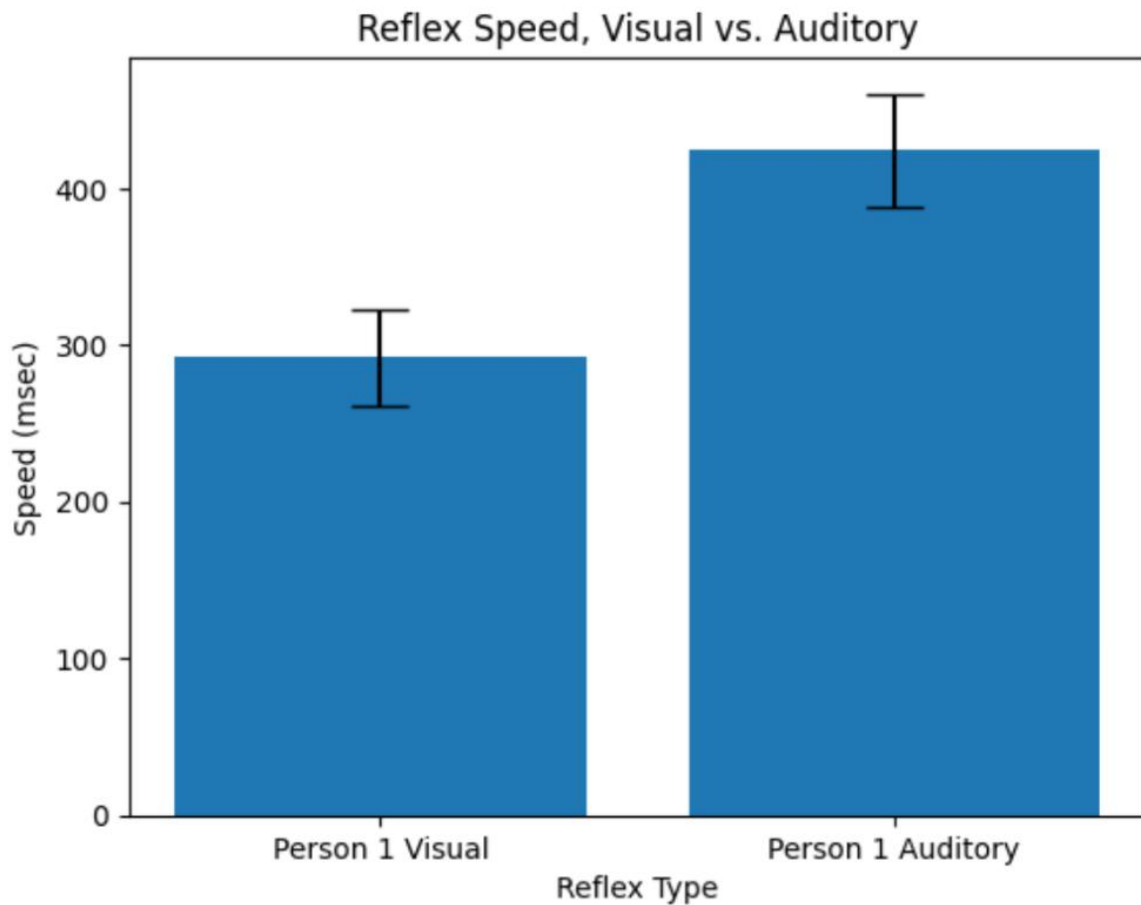
#### **5-C**

**1. For Prompted Auditory cues, repeat the procedures for 5-B on the previous page, but add an additional step. While still clicking the Event Marker button next to the subject's ear at irregular intervals, this time for each of the ten trials, give one word warning just before the click is about to happen. For example, the lab partner could say, "Soon" then click; wait 5 seconds, then say "Soon" then click; wait 7 seconds, then say "Soon" then click, and so on for ten trials.**

**2. For Predicted Auditory Cues, repeat the procedures for 5-B on the previous page, but alter Step 4. While still clicking the Event Marker button next to the subject's ear, this time for each of the ten trials, the lab partner should click the Event Marker button at regular intervals every five seconds.**

**3. Compare these classroom results with that from 5-B. Were the times generally shorter? Were the results for 5-C generated by the reflexes alone or could have higher cognitive functions/behaviors (such as anticipation or even simply having good rhythm) influenced the reaction times? Were there any invalid results in the class (e.g., the subject actually pressed the "Enter" key before the cue was given)?**

**Results:**



**Discussion:** My observation from this encounter was that the visual outcomes were less accurate than the aural ones. For my part, I was able to reply more quickly using audio. Compared to auditory information, visual information requires more processing because it is intensively processed. During the experiment, I saw that both my partner and I responded more quickly to auditory stimuli than visual ones, and that my partner responded more quickly to auditory stimuli than visual.

**Conclusion:** To sum up, responses from the auditory system were quicker than those from the visual system. The primary page showed me the variances in EEG patterns between a fully awake, resting individual and a busy one. Another thing we observed was the difference between an active and resting wakeful state. Additionally, we could tell that the waves are larger and more dispersed when a person is deeply asleep. From the image, I also observed that smaller and faster waves are triggered when a person is more engaged or has higher brain activity. I saw the connections between the em-100 and the speed at which our brains respond to visual stimuli vs auditory ones.