Lab Report 5 : Laboratory 5 – Electroencephalography & Reaction time

Purpose: The purpose of the lab is to investigate and understand sleep patterns using EEG technology and to explore the concept of reaction times through the study of simple reflexes, such as the knee-jerk reflex, which involve specific components in the nervous system.

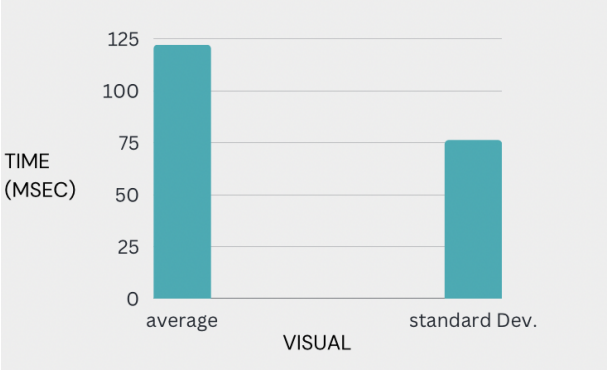
Procedures:

1. be sure the IWX/214 unit is plugged in, and that the IWX/214 unit is connected to the laptop by USB cable.Be sure that the EM-100 Event Marker is fully connected to the Channel 3 socket in front of the IWX/214 unit
2. Open the Labscribe3 program by clicking on the LabScribe3 icon on the desktop.
3. a window pop-up that says "Hardware found IWX214:2008-1-24," click "OK."
4. 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.
5. "Human Nerve." Click on that tab and that should lead you to the second tab called "Auditory-VisualReflexes," click on that tab.
6. Close the pdf file that opens automatically, you don't need it.
4. Pair up with a lab partner and arrange yourselves according to this recording setup:
    i. The student subject should sit in a chair facing the laptop computer with their hand in position so that they can press the "Enter" key as quickly as possible.
    ii. The lab partner holding the EM-100 Event Marker should stand out of sight of the subject. They need to be able to quietly press and release the button of the Event Marker once the test begins.
5. Type the subject's name and "Visual" in the Mark box that is to the right of the Mark button just above the data recording.

6. 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.
7. 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.
8. As soon as the subject sees the green line jump up, they need to press the "Enter" key as quickly as possible.
9. When this happens a small "Enter Mark Text" window will pop up, ignore it.
10. 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).
11. 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).

Results:

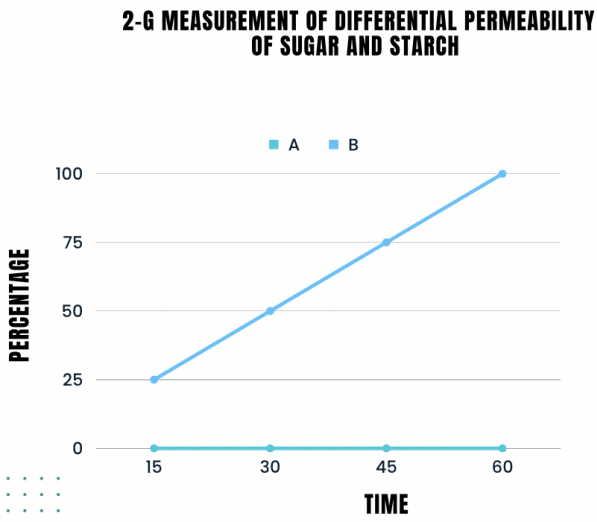
1	145ms
2	215ms
3	100ms
4	165ms
5	145ms
6	55ms
7	20ms
8	223ms
9	167ms
10	5ms



Discussion: We focused solely on examining reaction speeds in our EEG investigation. The dataset showed a standard deviation of about 76.1 milliseconds and an average reaction time of 122 milliseconds, indicating significant individual variability. This variation suggests that a variety of factors may be affecting participants' reaction times. To better understand the physics of reaction time variability and its consequences in varied circumstances, more research may study these elements in greater depth.

Conclusion: The lab aims to investigate sleep patterns using EEG technology and explore reaction times, such as the knee-jerk reflex, involving specific nervous system components. The data provided includes a range of reaction times, with an average of 122 milliseconds and a standard deviation of approximately 76.1 milliseconds. This dataset reveals variability in responsiveness among individuals, shedding light on both sleep physiology and the factors influencing reaction times in the study.

2-G Measurement of differential permeability of sugar and starch



Discussion: In conclusion, the series of experiments delved into fundamental biological processes, yielding valuable insights. The investigation of diffusion through liquids unveiled the temperature's impact on diffusion rates, with a constructed graph illustrating the relationship. Diffusion through agar highlighted the role of molecular properties in varying diffusion rates. The filtration experiment underscored how solution thickness affects filtration dynamics. Osmosis experiments provided a comprehensive view of water movement across membranes, emphasizing osmotic equilibrium. Differential permeability insights elucidated membrane selectivity. Lastly, the tonicity experiment demonstrated cellular responses to different solutions. Collectively, these experiments contribute significantly to understanding diffusion, osmosis, filtration, and cellular behaviors under varying conditions, spanning

implications across scientific, medical, and engineering domains.

Conclusion: In conclusion, the experiments delved into diffusion, osmosis, filtration, and tonicity. These investigations shed light on temperature's effect on diffusion, filtration dynamics, water movement in osmosis, and the impact of tonicity on red blood cells. Collectively, they provide valuable insights into fundamental biological processes and their underlying principles.