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1. Introduction

In order to do well, have deep understanding of yourself. Neurobiology and behavioral science, is interconnected field of study that is all-encompassing the relationship between the brain, behavior, mental processes, and environment. It's also a welcome idea, to see the brain as where our genes and the environment meet—where nature and nurture interact. (Akil, 2019) Which means, without the brain there will be no connection or interplay between the brain our gene and environment in shaping behavior.

The knowledge gain from neurobiology and behavioral science, helps in making informed decisions and effective strategies in health science. The fact that neurobiology, and behavioral science uses various research method such as case studies, survey, observations, interviews, experiment, and statistical analysis to collect and analyze data is one of the concern. The interdisciplinary approach such as neurobiology, psychology, sociology, and communication studies are not neglected. The study of human society, which include how behavior emerges from the complex interactions of the study of living thing and their environment, social structures, cultural norms, social inequality, the impact of an institute on human and social change is not forgotten. Behavioral science, social and behavioral science application is also included.

Neurobiology and behavioral science, is an intertwined field that linked the structure and function of the nervous system to the people behavior in their society, and societal structure. Neurobiology and behavioral science, serves a good help, in contributing to our understanding of the brain, and dealing with various social issues and human challenges. This claim is supported by the following researched work on the various topics, such as the concept of neurobiology and behavior, concept of neurodevelopmental disorders, and concept of cognitive neuroscience.

1.1 Section A Concept of neurobiology and behavior

Things can be influenced by other things. The concept of neurobiology and behavior, can be summarized as an interdisciplinary field that focuses on the nervous system influences, on the relationship between brain, and behavior of living organisms. Neurobiology, neuroscience, neural circuit are some of the principle and concepts of neurobiology and behavior. The study looks into the concept of neurobiology and behavior.

Neurobiology is a branch of science that has to do with the physiology, pathology and anatomy. It is a multidisciplinary field that relates to biochemistry, cell biology, molecular biology, genetics, pharmacology, psychology, and others. Neurobiology is also “the study of the cells and the mechanisms of cells involved in the functioning of the nervous system” (Austin, 2022). Neurobiology try to understand the behavior and the mechanisms pertaining to normal brain function, as well as the causes and treatment of neurological disorders. The main concept of neurobiology and behavior try to define how behavior emerges from the complex interactions of the study of living thing and their environment.

Neurobiology investigates the interaction of the brain and the nervous system with other systems in the body, such as the immune system, the body, and the endocrine system. While behavior is focused on the observable expression of mental state, such as, emotions, feelings, intentions, and thoughts. Behavior can be influenced by either external factors such as culture, social interaction, and environment or internal factors such as neurotransmitters, hormone, and genes. Because behavior can be modified by learning, the various ways to study behavior include anthropology, ethology, neuroscience and sociology.

The concept of neurobiology and behavior is aimed on the notion that both biological factors, such as brain activity, and environmental factors, such as stimuli, are the determinant of behavior. Neurobiology is the tool to understand how cells, molecules, systems, and circuits within the nervous system interact and contribute to functions, such as cognition, behavior, and sensory processing. By investigating these different levels of analysis, neurobiology provides more understanding into how brain works and how it influences our actions, emotions, and thoughts. Neurobiology looks into neurons communication with each other, also with other cells through chemical and electrical signal.

Neurobiology and behavior integrates the study of neurobiology with the insight and analysis of behavior at different levels. Some of the main points that addresses neurobiology and behavior are as follows: It has to do with the development of interventions for behavioral disorders and has practical applications in areas such as clinical psychology, neuroscience research, and animal behavior. The field help us to understand the complex interplay between the brain, genes, and the environment in

shaping behavior. This field use multidisciplinary approach, which combine techniques from neuroscience, psychology, genetics, and other related discipline. It studies how brain functions and influence or affects behavior. It also examines the neural mechanisms underlying various behaviors, such as decision-making, memory, learning, and social interactions.

The principle of neurobiology and behavior takes its root in the fact that neural activity is influenced by behavior, and behavior is the result of neural activity. Some of the principle and concept of neurobiology and behavior are: Neural mechanisms: The neural mechanism investigates the working of nervous system and how it contributes to behavior. It includes the understanding of the structure and function of synapses, neurons, neural circuits in other to understand how they transmit and processed information. Genes, brain, and environment: Genes, brain, and environment highlight the relationship between brain structure and function, genetic factors, and environmental influence in shaping behavior. It shows that behavior is a result of interaction between brain development, the environment they are exposed to, and individual's genetic makeup.

Other principle and concept of neurobiology and behavior are: Behavioral genetics: Behavioral genetics studies how genetic variations and genes influence personal behavior and traits, which is susceptible to neurological and psychiatric disorders. Neurological disorders: Neurological disorders are those conditions that affect the function of the nervous system, such as Parkinson's disease, epilepsy, Alzheimer's disease, and stroke.

One among other tools used in neurobiology and behavior research, is EEG (Electroencephalography) which is technology widely used in neurobiology and behavior research to measure and analyze attention. It can help in understanding attention-related processes, because it provides valuable insights into brain activities. EEG is used in EEG and attention, attention assessment, attention enhancement, neuroplasticity and attention.

My opinion and analysis of the concept of neurobiology and behavior, is that it is a fascinating field that focuses on the relationship between the function, and structure of the nervous system, behavior, and interaction of living organism from molecules to ecosystems, at all level of analysis. In my opinion it is a field that has many ways of applying it in understanding human cognition, disease, emotion, health, learning, memory and social behavior. It is very relevant and important for understanding ourselves, how our brain makes decisions, and other living organisms. For more understanding, the brain makes its proper decisions by accumulating evidence until there is enough to stop and choose. (Stine, Jeurissen, Shadlen, & Trautmann, 2023) I admire the efforts of behaviorists and neurobiologists in their use of method such as genetics, molecular biology, pharmacology, electrophysiology, computational modeling, imaging and behavioral experiments.

I would apply the knowledge of the concept of neurobiology and behavior in my life, work and community as follows: In my life, the concept of neurobiology and behavior would help me to improve my physical and mental health, by learning how my brain responds to emotions, stress, and habits.

In my work, the understanding of the concept of neurobiology and behavior would help me to be creative, collaborate, and enhance my performance, by learning how my brain process information, communicate with others and solve problems. I would use molecular and genetic techniques to identify the neural substrate of behavior, such as decision making, reward, and motivation. I would also use EEG signals to ascertain the different cognition and emotional states of others, such as attention, sleep disorders, fatigue, mood, and workload. Electroencephalogram (EEG) is a measure of brain activity or electrical activity in the brain using metal disc called electrode attached to scalp. (NHS, 2022) This is a painless test, that show on an EEG recording a wavy line.

In my community, I would use the understanding of the concept of neurobiology and behavior to foster social harmony and justice by learning how our brain shapes, and is shaped by the social environment. I would use the concept of neurobiology and behavior to change the behavior of individuals in my community, by using behavioral and neural interventions such as empathy, cooperation and promoting altruism to influence them. I would also use the evolution and comparative approach to study the variations and origins of behavior across different species and cultures.

My brain adapts and changes, the more I learn new things. My personal experience of the concept of neurobiology and behavior is in learning new skill in AIU, which involved the formation of new neural connections and the strengthening of existing ones through practice, intensive study and lecture.

Another personal experience of the concept, is about my mood or emotions which are being influenced by the levels of neurotransmitters such as dopamine, serotonin, and norepinephrine in my brain. And these chemicals will in turn affect the reward system, mood, and motivation.

The case example to demonstrate the concept of neurobiology and behavior is in learning and memory. Neurologists are still engaging on investigation of how the brain forms, stores, and retrieves memories, and how these processes are affected by factors such as stress, aging, diseases and drugs, while the behaviorists examine how one can learn through imitation, observation, and punishment. They are also considering how these principles can be used to modify behavior in different ways such as animal training, therapy, and education.

The picture, table and graph originally produced by me to illustrate the concept of neurobiology and behavior using 150 dpi resolution is shown below:

The figure (fig) 1 picture below is used to demonstrate the Pearson's correlation coefficient test in Excel, to measure the relationship between brain size and average body size of different animal species. Pearson correlation coefficient, is one way to quantify or measure the linear association between two variables. (Zach, 2020) The table for the test is shown in fig. 1.1 below:

Fig 1

Coefficient(r) :	0.892449338
N:	5
T statistics:	3.426301082
DF:	3
P value:	0.041650498

Fig. 1.1 is the data of brain sizes gotten using ImageJ software and its tool." ImageJ is a powerful tool for image analysis" (PhDCoffeeTime, 2020). The average body size of the different animal species was based on the calculated average body sizes of different animal species gotten from my vast research.

fig. 1.1

Animal Kind	Brain Size (g)	Average body size (g)
Human	1300	62000
Dolphin	1500	150000
Chimpanzee	400	47000
Dog	70	10000
Cat	30	18

fig. 1.2

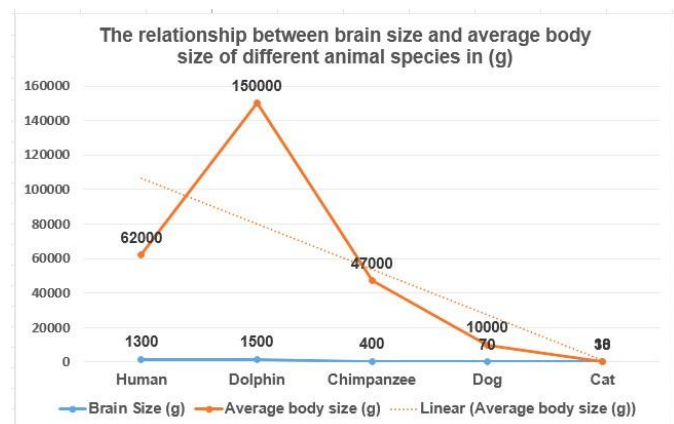


Fig. 1.2 is a graph of fig 1.1 table above. The given correlation coefficient of 0.892449338 and the p-value of 0.041650498 in fig. 1, indicate a strong positive correlation between brain size and average body size of the various animal species. A coefficient close to 1 indicates a strong positive correlation. This suggests that as the brain size of the animal species increases, the average body size also tends to

increase. The p-value 0.041650498, in this relationship is statistically significant when compare with a conventional significance level of 0.05. Based on the data and statistical analysis, I conclude that there is a strong positive correlation between brain size and average body size of the various animal species. Also there is statistically significant evidence to reject the null hypothesis because the p-value is less than 0.05.

By observing the dotted trend line, one can understand the direction and strength of the relationship between brain size and average body size of the various animal species. The spread of the data points was not too far from the trend line indicating a strong linear relationship.

1.2 Section B Concept of neurodevelopmental disorders

The root cause of every disorder need to be considered. The concept of neurodevelopmental disorders can be summarized as disabilities linked with the functioning of the neurological system and brain, causing impairments in various domain of life. Some of the concept of neurodevelopmental disorders are: motor disorder, down syndrome, and rett syndrome. The study looks into the concept of neurodevelopmental disorders.

The understanding of neurodevelopmental disorders is very important for promoting awareness and support for individuals that have any impairment of any kind. Neurodevelopmental disorders are those “disabilities associated primarily with the functioning of the neurological system and brain” (EPA, 2023). Neurodevelopmental disorders, being conditions that affect the development of the brain and nervous system, causing uncoordinated behavioral functioning, cognition, communication, emotional, and social life.

Because each individual suffering from neurodevelopmental disorders experience may vary, professional guidance and support is essential for understanding, and managing the condition effectively. This disorder usually manifests in childhood, often before the child start school and are characterized by impairments in their behavior, and in various aspects of life. Irrespective of the various symptoms of different kinds of neurodevelopmental disorders (NDs), the general descriptions usually consist of impairments with the following: Motor skills, speech, social skills, emotions, learning memory, language, and behavior. (Blain, 2022)

Some common neurodevelopmental disorders, their causes, symptoms, diagnosis, treatment are: Attention-Deficit/Hyperactivity Disorder (ADHD) This is a disorder that is characterized by hyperactivity, lack of attention, impulsivity, and difficulties with attention and focus. Hyperactivity simple mean excessively active, fretful and, restless.

Causes: The causes of ADHD are not well-known, but is consider to has something to do with the combination of neurological factors, genetic, and environmental.

Symptoms: Impulsive, inattention, hyperactivity, poor organization skills, and difficult in focusing.

Diagnosis: Diagnosis of (ADHD) is based on behavioral observation, and interviews.
Treatment: Treatment is with psychotherapy, behavioral therapy, medication (such as stimulants), and interventions in the school by teachers.

Autism Spectrum Disorder(ASD): This is a disorder associated with communication challenges, stereotyped patterns of behavior, difficulties in social interaction, and repetitive behavior. According to Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2020, “ASD is nearly 4 times more common among boys than among girls” (Maenner, Warren , & Williams , 2023). The people with ASD may not found it easy to understand, expressing emotions, making eye contact and even interpreting nonverbal signals.

Causes: This is thought to be caused by a combination genetic and environmental factors.

Symptoms: Repetitive behaviors, social and communication difficulties, sensory sensitivities, restricted interest.

Diagnosis: Diagnosis of (ASD) is based assessment by healthcare professionals and behavioral observations.

Treatment: Behavioral therapy, early intervention programs, occupational therapy, speech therapy, medication for associated symptoms.

Intellectual Disability (ID): This is a condition that are characterized by noticeable limitation in adaptive behavior, self-care, learning, communication, and intellectual functioning.

Causes: This is thought to be caused by prenatal factors like exposure to toxins, perinatal factors like complication during birth, postnatal factors like infections, and genetic conditions.

Symptoms: Limitations in adaptive skills, below average intellectual functioning, and difficulties with learning.

Diagnosis: Diagnosis of (ID) is based on intellectual and adaptive functioning assessments.

Treatment: Therapy to enhance adaptive skills, vocational training, individualized education plans, and supportive services.

Specific Learning Disorder (SLD): This is a type of disorder that has to do with difficulties acquiring and using specific skills, such as mathematics reading and writing.

Causes: This is thought to be caused by genetic and environmental factors though the cause of the specific learning disorder are not fully understood.

Symptoms: Significantly below expected levels for the individual’s age and intelligence, difficulties in reading, and writing.

Diagnosis: Diagnosis of (ID) is based on cognitive abilities and thorough assessments of academic skills.

Treatment: Accommodations, individualized education plans, support services, and specialized education.

According to the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR), NDs conditions generally appear in early childhood, usually before children start school, and can persist into adulthood. (American Psychiatric Association, 2022) My opinions and analysis of the concept of neurodevelopmental disorders is a suggestion that assessment and diagnosis should be flexible. The treatment and support should be responsive and adaptive to the goals and changing needs of the individual and their family. Hence neurodevelopmental disorders are not static but dynamic. They are depending on the developmental stage, and can change over time. Therefore, the intervention to such an individual will need to be robust.

I would apply the knowledge of the concept of neurodevelopmental disorders in my life, work and community as follows: In my life, the concept of neurodevelopmental disorders would enable me to support and advocate for individuals with neurodevelopmental disorders. The concept would help me to accommodate and seek appropriate support, treatment, as well as to cope with their conditions and adequately strengthens association with neurodevelopmental disorders (NDs).

In my work, the understanding of the concept of neurodevelopmental disorders would help me in serving people who have NDs as a health professional. The concept of neurodevelopmental disorders would help me to have adequate understanding of the unique conditions of people with NDs. It would in turn help me to be informed of the best approach to support and accommodate individual in these setting as an NGO.

In my community, I would use the understanding of the concept of neurodevelopmental disorders to raise awareness of NDs in my community, promote understanding and acceptance and help in reducing stigma. I would advocate for appropriate services, resources, and support systems for individuals with NDs. On such move I would contribute to a more inclusive and equitable community.

My personal experience of the concept of neurodevelopmental disorders and the people living with it is that it can be challenging, but can also be rewarding. They can benefit from the support and acceptance of their friends, families, communities and teachers, who can provide them with the resources and opportunities the need to thrive. I notice that the NDs have many talents, interest, and abilities that can enhance their lives and the lives of others. An inclusive, and compassionate society can be created by recognizing the potentials of people with neurodevelopmental disorders.

The case example to demonstrates the concept of neurodevelopmental disorders is the case of three different children with one of the following disorder motor disorder, down syndrome, and rett syndrome. Motor disorder: The child with motor disorder have challenges with fine and gross motor skills, balance and coordination. Motor disorder of this such as developmental coordination disorder (DCD), has to do with difficulties with motor coordination and control.

Down syndrome: The other child with down syndrome is living with intellectual disabilities, an increase risk of certain medical conditions, and distinctive physical features. Down syndrome is a genetic disorder, which is caused by the presence of an extra copy of 21 chromosomes. Rett syndrome: The third child is a girl with rett syndrome has severe cognitive and physical impairments, development of repetitive hand movements, and loss of purposeful hand skills. Rett syndrome is a rare and uncommon genetic disorder that primarily affect girls.

The picture, table and graph originally produced by me to illustrate the concept of neurodevelopmental disorders using 150 dpi resolution is shown below:

Fig 2 picture below is used to demonstrate the Pearson's correlation coefficient analysis in Excel, to analyze the relationship between age and severity in children with autism spectrum disorder (ASD). The table for the test is shown in fig 2.1 below

Fig 2

Coefficient (r) :	0.284661927
N :	15
T statistic :	1.07065849
DF :	13
P value :	0.303798881

Fig 2.1 is the data of age and severity in children with autism spectrum disorder (ASD). The data was randomly gathered from a population of those living with ASD from a distance not too far from my local government. The sample of 15 ASD patients was selected which include boys and girls. For ethical purposes their names were alphabetically represented.

Fig 2.1

Child	Age (years)	Severity (score)
A	5	7
B	6	8
C	4	6
D	3	4
E	2	5
F	3	3
G	3	6
H	4	4
I	5	3
J	2	9
K	6	5
L	3	6
M	4	7
N	5	8
O	7	9

fig 2.2

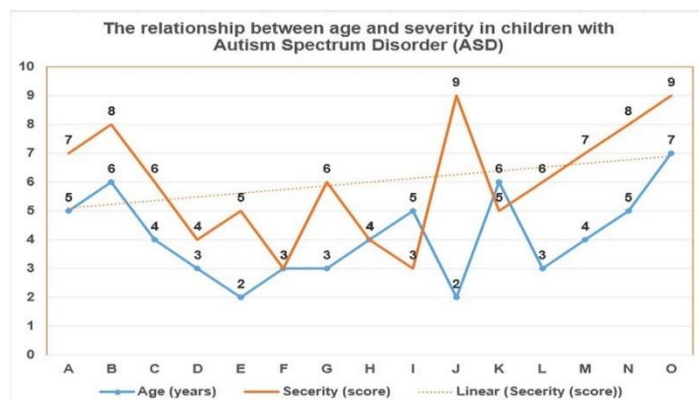


Fig 2.2 is a graph of fig 2.1 table above. The given correlation coefficient of 0.284661927 and the p-value of 0.303798881 in fig 2, indicate that there is no meaningful or significant linear relationship between age and severity in children with ASD, as indicated by the very weak correlation coefficient and the non-significant p-value.

The correlation coefficient (r) of 0.0284661927 shows a very weak positive correlation between age and severity in children with ASD. This suggests that there is almost no linear relationship between age and severity. Based on my data and statistical tests performed, the analysis suggests that age is not significantly correlated with severity in children with ASD. The dotted trend line suggests that there was no correlation between the variable.

1.3 Section C Concept of cognitive neuroscience

The mental process that involve knowledge cannot be overemphasized. The concept of cognitive neuroscience studies the relationship between the behavior, brain and cognition. The study looks into the concept of cognitive neuroscience.

The concept of cognitive neuroscience is a field that explore how brain enable cognition. Also “cognitive neuroscience is an interdisciplinary area of research that combines measurement of brain activity (mostly by means of neuroimaging) with a simultaneous performance of cognitive tasks by human subjects” (Pereira, 2007).

Some of the concepts of cognitive neuroscience are: Brain plasticity: This is the ability of the brain to adapt and change throughout a person life in response to environmental factors, experiences, and learning. Attention: This is the process that allow one to selectively focus on specific stimuli while excluding irrelevant ones. It involves the brain region and circuits, which include the parietal cortex and prefrontal cortex.

Attention Deficit Hyperactivities Disorder (ADHD): This is a disorder called neurodevelopmental disorder which is known by difficulties with attention, impulsivity, and hyperactivity, Emotion and effect: This is investigating to ascertain the neural mechanisms that is the fundamentals base of emotion or emotional regulation and its impact on emotional state and cognitive process.

Executive functions: This is a cognitive process that regulates and controls behaviors, such as decision-making, planning, problem-solving and working memory.

Language processing: This is the study of how the brain processes, produces and comprehends language. It involves the important areas for language comprehension and production, such as Wernicke’s area and Brocas’s area.

Memory: This is the enablement of the brain to store and retrieve information and how it can be influence by aging, context, and emotion. There are different kinds of memory which include episodic, long-term memory, semantic memory, short-term memory, and working memory.

Neuroanatomy: This is the study of the organization and structure of the brain, which include different lobes, regions, and their functions. **Neuronal communication:** This is the understanding of how neurons electrical and chemical signal communicate with each other, which include the action potential, neurotransmitters, synapses, and receptors.

Perception: This is how brain process and interpret sensory information from the environment, such as auditory perception (hearing), olfactory perception (smell), visual perception (vision), gustation (taste), and tactile perception (touch). **Social cognition:** This is the understanding of how the brain interact or process social information, of the mental state such as emotion, belief, empathy, decision-making, theory of mind, including recognition of faces.

The principles of cognitive neuroscience are: **Cognitive psychology:** This focused on examining mental processes such as attention, memory, decision-making, perception, reasoning, and problem-solving, and how they affect human cognition. **Cognitive disorder:** These are those conditions that affect cognitive processes, such as attention-deficit/hyperactivity disorder, schizophrenia, and Alzheimer's.

Computational: This is the understanding of brain cognition and function involving mathematical and computational model. **Neurotransmitters:** This is the transmission signals of chemical substances between neurons in the brain that play very important role in cognitive processes and behavior.

Neuroscience: This is a field of study that focuses on studying the nervous system, its structure, function, development and the effect on cognition and behavior. **Neuroscientists** has to do with the brain, how it influences behavior and cognitive functions. (Stacy Sampson, 2018) **Neuropharmacology:** This is aimed on the effect of drugs on the nervous system and how they influence behavior and cognition processes.

Neuroimaging: This involves the use of various imaging techniques, such as electroencephalography (EEG), or functional magnetic resonance imaging (fMRI) to study brain function and structure during cognitive tasks. **Neural basis of cognition:** It focus on investigating the neural mechanisms which is fundamentally cognitive processes, such as the function of different brain regions and networks contribute to perception, language, decision-making, and memory.

Cognitive neuroscience combines method and principles from neuroscience, psychology, and other disciplines in bringing into the understanding of how brain helps

cognition processes such as attention, decision-making, language, problem solving and memory.

My opinion and analysis of the concept cognitive neuroscience is that is an important field of study, particularly in this social and technological era. It serves the purpose of improving well-being, communication, education, and health, by applying the findings of cognitive neuroscience to various domains and contexts. The concept cognitive neuroscience gives an insight to our potentials and limitations as human beings.

I would apply the knowledge of the concept of cognitive neuroscience in my life, work and community as follows: In my life, the concept cognitive neuroscience would help me to understand myself better in areas such as emotion, motivation, personality, preferences, and strength. It would help me to improve my cognitive abilities, such as self-regulation, problem-solving, memory, creativity, and attention, if such need arises, by using techniques such as brain training, transcranial simulation, meditation, and neuro-feedback.

In my work, the understanding of the cognitive neuroscience would help me to enhance my well-being, performance, and productivity, by applying the principle of neuro-marketing, neuro-leadership, and cognitive ergonomics. For more understanding, neuro-marketing would help me to understand the consumer's preference and behavior, by measuring their brain responses to different pharmaceutical products in relation to benefit, risks, use of drugs and advertisements. Neuro-leadership would help me to develop an effective leadership skill, such as motivation, emotional intelligence, decision making, communication, by understanding how the brain responds to different situations and stimuli. Cognitive ergonomics would help me to optimize my cognitive resources, design work environments, and reduce fatigue and stress. The task analysis of Cognitive ergonomics is concerned with behavior and understanding of humans, as they interact with machines. (Kosky & Wise, 2021)

In my community, I would use the understanding of the concept of cognitive neuroscience to address social issues, such as security, justice and education, by providing evidence-based solutions. I would use the understanding of the concept of cognitive neuroscience to foster social cohesion, inclusion and diversity, by using the neural basis of social cognition, morality, cooperation and empathy.

For more understanding, security neuroscience would help me to prevent and counteract threats, such as cyberattacks, and terrorism, by having good understanding of the neural and psychological factors that can influence radicalization and aggression. For justice, forensic neuroscience would help me to assess the mental state and responsibility of criminals, by using techniques such as lie detection and brain imaging. Educational neuroscience would help me to design curricula and pedagogy that suit different learning styles and needs, by examining how the brain learns and develops

My personal experience of the concept of cognitive neuroscience, was a collection of case studies of patients, with neurological disorders that affect their cognition, and behavior, from the book “The man who mistook his wife for a hat, by Oliver Sacks. The first case in my arrangement was a patient who had amnesia, which is a condition that impaired his ability to form new memories. He could remember everything that happened before his brain injury, but he could not remember anything that happen after it. He lived in constant present, aware of what happen before his injury, and unaware of the passage of time.

The second case was a patient who had aphasia, a health condition that impaired his ability to comprehend language. He could only communicate with gestures, though could still sing, and utter few words. The third case was a patient who had visual agnosia, which is a health condition that impaired his ability to recognize objects and faces. He could be able to see the shapes and color, but he could not identify what they were. He mistook his wife’s head for a hat and tried to grab it. These cases had shown how damage to different part of the brain are responsible for different aspects of cognition, impairments and deficits.

Another personal experience of the concept of cognitive neuroscience was when I witness a research study that used electrical signals that are generated by the neurons in the brain. The researchers told one of the participant to wear a cap with electrodes attached to it, and then he was shown different images on a computer screen. The wanted him to see how his brain responded to different images of stimuli, such as faces, objects, numbers and words. They also asked him to perform some tasks, such as naming the images. It was very interesting to noticed how his brain activity changed depending on what he was looking at or doing. The researchers explained to him that they were studying the neural correlates of various cognitive function, such as perception, attention, memory, language, and executive control. The EEG is a method that record or measure the brain activity or the electrical signals that are generated by the neurons in the brain.

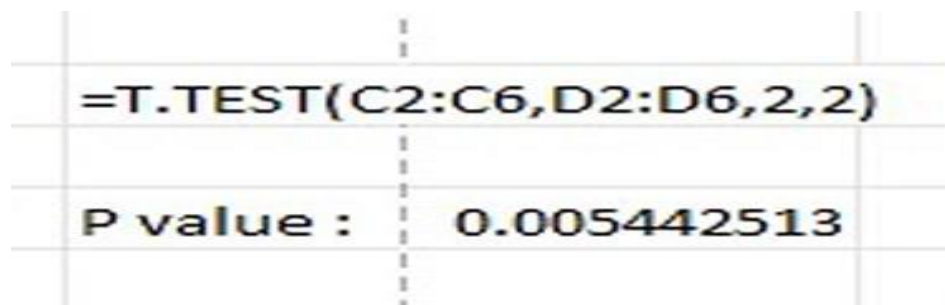
The case example to demonstrate the concept of cognitive neuroscience is a case to diagnose, and treat neurological and psychiatric disorder. cognitive neuroscience can be of a good help in identifying the brain regions and networks that are impaired in patients with, Parkinson’s disease, depression, schizophrenia, and others. It can also be used to determine or evaluate the effectiveness of interventions, such as psychotherapy, cognitive training, brain simulation and medication, while the improvement of cognitive function and quality of life is being monitored.

The picture, table and graph originally produced by me to illustrate the concept of cognitive neuroscience using 150 dpi resolution is shown below:

Fig 3 below is used to demonstrate the students t-test function in Excel, to obtain a statistical assessment of the reaction times of 10 participants, grouped into two, five for each group of condition A as intervention and condition B as placebo in a cognitive

neuroscience experiment, to test the effectiveness of new antimalarial drug (name withheld for ethical reasons), using PsychoPy software for memory recall experiment with visual stimuli after complete dosage. PsychoPy is use to build experiment and show stimuli. (Jason Ozubko, 2021) Each of the group condition A as intervention and condition B as placebo were represented alphabetically A to E. For more understanding “a t-test is an inferential statistic used to determine if there is a significant difference between the means of two groups and how they are related” (T. Editors of Encyclopaedia , 2023). The table for the test is shown in fig 3.1 below:

Fig 3



=T.TEST(C2:C6,D2:D6,2,2)	
P value :	0.005442513

The p-value 0.005442513 gotten was less than the significant level 0.05, indicate that there is a statistical significant difference between the reaction times for the cognitive responses of the two conditions (intervention and placebo). The lower mean value of cognitive response in the intervention group (263) compared to the placebo group (285) suggests that the new antimalarial drug may have a noticeable impact on cognitive function.

Given the statistical significance and the difference in means, I inferred that the new antimalarial drug might have effects on cognitive processes, which could be further investigated in the context of its side effects or potential benefits. Because the ratio of my variance is not greater than two I considered it equal variance. This serves as an indication that the difference in the reaction times between the two conditions is unlikely to have occurred only by random chance. On that note, I concluded that the conditions have different effects on reaction times.

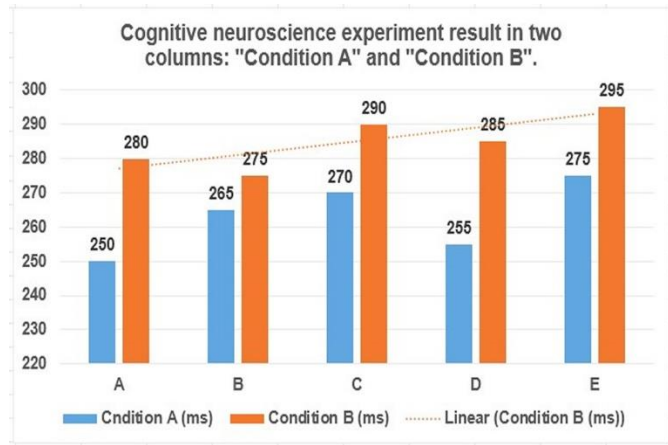
In conclusion, the cognitive neuroscience experiment suggests that the new antimalarial drug, as indicated by the significant difference in cognitive responses and lower mean value in the intervention group, may have an effect on cognitive function. However, I maintained that further research and clinical trials would be necessary to validate these findings and understand the broader implications of the intervention. Fig 3.2 is the graph of fig 3.1.

Fig 3.1

Participant	Condition A (ms)	Condition B (ms)
A	250	280
B	265	275
C	270	290
D	255	285
E	275	295

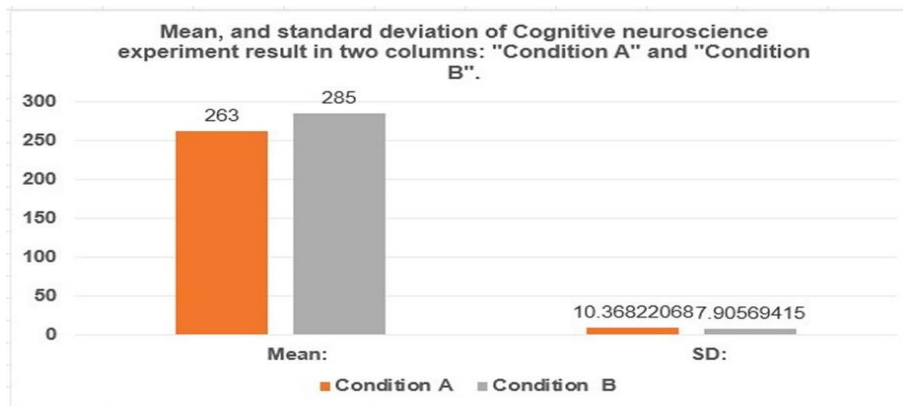
Mean: 263 285
SD: 10.36822068 7.90569415

fig 3.2



In fig 3 the mean reaction times and standard deviations in relation to the t-test analysis, is the visualization of the nature of the difference between the condition A as intervention and condition B as placebo in my cognitive neuroscience experiment.

Fig 3.3



1.4 Conclusion

In sum, neurobiology and behavioral science helps one to have a deeper and a very good understanding of their brain and cognition, in relation to human behavior and thought processes. This essay has looked into the title neurobiology and behavioral science with the following topics: The concept of neurobiology and behavior, concept of neurodevelopmental disorders, and concept of cognitive neuroscience, from different perspective and context. Such as the area of summary, description, analysis,

application, personal experience and examples of each of the concepts in addition with pictures, tables and graphs.

The essay has shown that all this concept can be applied in the real life. The essay has also shown that neurobiology and behavioral science is a complex field that needs a lot of skill and understanding. It is a broad field that plays a very important role in understanding human behavior and their social interactions. Neurobiology and behavioral science can be of a help for an individual to understand how they can improve their health standard. The essay has highlighted some of the similarities and differences among these perspectives and contexts. It has also present some of the challenges and opportunities for collaboration and interpretation.

The research supports these meaningful good words: There is the need for more robust, comprehensive and coherent way of explaining behavior without these different levels of the interactions of multiple factors, such as genes, systems, molecules, cells, cognition, circuits, culture and others. Because the developmental stage of neurodevelopmental disorders can change over time. There is the need for a robust intervention to neurodevelopmental disorders patients. There is the need to solve complex and intricate system challenges that are still affecting more understanding of the neural basis of cognition, irrespective of the valuable cognitive neuroscience framework.

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