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# Understanding human brain: A reflection of Quran and science

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**Abstract**---In the last decades, Quran and science has attracted a huge body of research and neuro-theology is a modern interdisciplinary field aimed to study brain in religious and spiritual experiences. As a multidisciplinary field neuro-theology combines distinct approaches and theoretical frameworks from Quran, religious studies, philosophy, neuroscience, and cognitive science. The human brain is the great sign among the signs of God that indicates His magnificence. The scientific studies are resplendent with Quranic signs about the realities of human brain. The purpose of this study is to provides a vital link to understand the human brain through Quranic verses and scientific findings. This paper will try to come up with some of the best Quranic testimonials both in Arabic and English translation as a testimony to the fact to prove the correlation between both. The study could be divided into certain sub headings with a conclusion at the end.

**Keywords**---neuro-theology, Quran, brain lobes, memory, neurosciences, human psychology.

**Introduction**

Neuro-theology is an interdisciplinary field that studies the neurological process of religiosity which is also known as *Biotheology*. It is an emerging field of scientific study of what happens to brain during religious or spiritual activities. The advances in brain imaging techniques like PET (Positron Emission Tomography), MRI (Magnetic Resource Imaging), fMRI (Functional Magnetic Imaging Resource Technique) made it possible to detect which part of brain is

active during religious experience. These neuroimaging studies reveals that neurotransmitters and specific neural networks are involved with these experiences. According to prominent neuroscientist Sousa, although Educators (teachers and lecturers) are not brain experts, but educators are one of the professions whose every day work changes or develops the potential of the brain (Sousa, 2012). Alireza Sayadmansour in his study titled “Neuro-theology: The Relationship between Brain and Religion”, provides an important definition:

Neuro-theology, also known as “spiritual neuroscience”, is an emerging field of study that seeks to understand the relationship between the brain science and religion.<sup>2</sup> Scholars in this field, strive up front to explain the neurological ground for spiritual experiences such as “the perception that time, fear or self-consciousness have dissolved; spiritual awe; oneness with the universe.” There has been a recent considerable interest in neuro-theology worldwide. Neuro-theology is multidisciplinary in nature and includes the fields of theology, religious studies, religious experience and practice, philosophy, cognitive science, neuroscience, psychology, and anthropology. Each of these fields may contribute to neuro-theology and conversely, neuro-theology may ultimately contribute in return to each of these fields. Ultimately, neuro-theology must be considered as a multidisciplinary study that requires substantial integration of divergent fields, particularly neuroscience and religious phenomena. More importantly, for neuro-theology to be a viable field that contributes to human knowledge, it must be able to find its intersection with specific religious traditions.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3968360/> - CIT0004 For instance, Islam is powerful, growing religion that would seem to be an appropriate focus of neuro-theology. After all, if neuro-theology is unable to intersect with Islam, then it will lack utility in its overall goal of understanding the relationship between the brain and religion. Obviously, these resulting changes of behavior would lead to a better understanding or perception of the world around us creating better harmonious, functional individuals, who can be the driving force behind change and on a larger scale of family and society as well. (Sayadmansour)

Furthermore, Sylwester’s study states that for centuries Educators developed the potential of the brain without knowledge of brain science or neuroscience (Sylwester, 2012). Suyadi in his paper titled “Hybridization of Islamic Education and Neuroscience: Transdisciplinary Studies of 'Aql in the Quran and the Brain in Neuroscience” makes an important observation in his paper taking from above mentioned quotes and comments that: “Therefore, interdisciplinary, multidisciplinary and disciplinary approach is needed to integrate Islamic education and neuroscience.” (Suyadi 237)

## **Memory**

The brain is the most complex creation of the Allah that man has bestowed with. It is the brain that differentiate us from other living creatures and makes human formidable. It consists of 100 billion neurons called nerve cells which are connected through trillions of specialized connections called synapses. In a study, it was reported that 1 synapse can store up to 4.7 bits of information and the cerebral cortex alone contain 125 trillion synapses. However, an adult human

brain can store 1024 terabytes or a million gigabytes of memories. Hafeezullah Amin et al. in their paper titled "Human Memory Retention and Recall processes" argues that:

Human memory is an important concept in cognitive psychology and neuroscience. Our brain is actively engaged in functions of learning and memorization. Generally, human memory has been classified into 2 groups: short-term/working memory, and long-term memory. Using different memory paradigms and brain mapping techniques, psychologists and neuroscientists have identified 3 memory processes: encoding, retention, and recall. These processes have been studied using EEG and functional MRI (fMRI) in cognitive and neuroscience research. This study reviews previous research reported for human memory processes, particularly brain behavior in memory retention and recall processes with the use of EEG and fMRI. We discuss issues and challenges related to memory research with EEG and fMRI techniques. (Amin 330)

Every aspect of our shared humanity is derived from this complex network. So, without the brain we could not breathe, work, play or remember. Every organ of body is blessing in itself. However, brain, a vital organ, which makes the life meaningful. Allah, says in the Holy Quran:

وَفِي أَنْفُسِكُمْ ۖ أَفَلَا تُبْصِرُونَ [٥١:٢١]

"And also, in your own selves (are signs). Will you not then, see?" (*Surah Adh-Dhariyat* 51:21)

It could be ascertained that, memory is the most wonderful thing that Allah has bestowed to humans. Certainly, it plays a significant role in individuals lives. Furthermore, is the memory that helps us to remember enormous amount of information about ourselves and the world around us. Scientists report that there are specific areas in brain responsible for holding all information. However, these are held by a group of neurons or nerve cells called assemblies. For instance, information of skills resides in the brain region called striatum and the recalling of factual memories resides in a region called hippocampus. So, it is the human brain that makes a man virtually alive without it he would be like a lifeless object. Allah, says in the Noble Quran:

وَلَوْ نَشَاءُ لَمَسَخْنَاهُمْ عَلَىٰ مَكَانَتِهِمْ فَمَا اسْتَطَاعُوا مُضِيًّا وَلَا يَرْجِعُونَ [٣٦:٦٧]

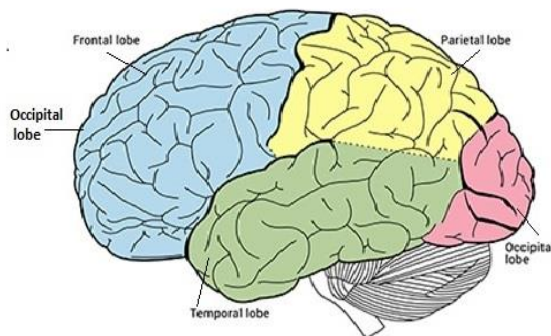
"And if it had been Our Will, we could have transformed them (into animals or lifeless objects) in their places. Then they should have been unable to go forward (move about) nor they could have turned back:" (*Surah Ya-Seen* 36:67)

Therefore, Allah mentions in the Quran that He directs His creation as He likes and this occurs through controlling the memory of all His creation. It could be inferred from this verse that there are specific regions in humans which holds information about oneself and the world around. If one loses one's memory one would lose all the information in one fell swoop. So, what scientists discovered in last 70 years was already mentioned in Quran some 1400 years ago.

## Brain Lobes

The human brain is not only one of the important organs of the human body; it is also the most complex than any other known structure in the universe. The brain is divided into four major sections known as lobes —the frontal lobe, the temporal lobe, the occipital lobe, and the parietal lobe. Each lobe has exclusive role to play and some functions associated with it are as:

1. The Frontal Lobe,
  2. The Temporal Lobe,
  3. The Occipital Lobe,
  4. The Parietal Lobe
1. *The frontal lobe* is responsible for conscious thoughts, attention span, judgement, perseverance, critical thinking, impulse control, problem solving, organising and management, supervision, self-monitoring, forward thinking, memory for skills and motor activities.
  2. *The temporal lobe* is in control of holding memories and acquiring the knowledge, interprets auditory stimuli, understands spoken form of language and controls the ordering of things.
  3. *The occipital lobe* processes visual form of information, construe shape, distance, and colour.
  4. *The parietal lobe* is in control of visually determining the depth, location, perception of touch, monitoring sensation and body position, face recognition, understanding time, goal directed voluntary movements and manipulation of objects.



## Frontal Lobe

The largest lobe in the human brain is the frontal lobe which is responsible for voluntary functions, and other higher level of cognitive functions called as executive functions. The executive function deals with a number of cognitive skills like organizing, self-monitoring, planning, initiating, supervision, maintaining observable behaviour, achieving one's goal. Frontal lobe is a house of emotional control and behaviour centre and a home to our personality.

Research carried out in recent years has revealed that the prefrontal area, an area located in the frontal lobe is responsible for the management of certain cognitive functions. This area of the cerebrum is also responsible for motivation, telling truth, or lies, initiating good or evil behaviour, ability to recognise future consequences resulting from current actions. As to voluntary motivation the prefrontal cortex is also considered to be the functional centre for aggression.

The prefrontal cortex is divided into three main parts so-called *Dorsolateral Prefrontal Cortex*, *Orbital Frontal Cortex*, and *Ventral Lateral Prefrontal Cortex*. In recent years, a few studies of the human brain have been conducted by neuroscientists, forensic psychiatrists, and criminologists. However, forensic psychiatrists and criminologists specifically focused on prefrontal cortex. Studies reveal that some parts of the prefrontal cortex are responsible for maintaining emotions in each situation, keeping an appropriate behavior, follow rules and laws of the society. This area is responsible for the wicked behavior, and greatly contributes to what makes a person inhuman. The study of patients with prefrontal cortex damage revealed that patients lost their temper on small things. For example, if his pen ran out of ink during class, he might toss it at someone and not realise that he will need a pen the next day and it is a time to go get one. The frontal lobe is the area responsible for final decision making when doing crimes such as murder, rape, robbery, etc. The Orbital Frontal Cortex which plays much of the moral decision making like what is right and what is wrong. Thus, it is very clear that prefrontal cortex is the area where lying and sinning takes place. Parallel information to these scientific facts discovered in the last 60 years was also imparted in the Quran fourteen centuries ago. Allah says in the Quran:

أَلَمْ يَعْلَم بِأَنَّ اللَّهَ يَرَىٰ [٩٦:١٤] كَلَّا لَئِن لَّمْ يَنْتَه لِنَسْفَعَا بِالنَّاصِيَةِ [٩٦:١٥] نَاصِيَةٍ كَاذِبَةٍ خَاطِئَةٍ [٩٦:١٦]

“Does he not know that Allah sees?” “No! if he does not desist, we will surely drag him by the forelock.” “A lying, sinning forelock.”

The Holy Quran also mentioned the forelock in *Surah Hood* as:

إِنِّي تَوَكَّلْتُ عَلَى اللَّهِ رَبِّي وَرَبِّكُمْ ۚ مَا مِنْ دَابَّةٍ إِلَّا هُوَ آخِذٌ بِنَاصِيَتِهَا ۗ إِنَّ رَبِّي عَلَىٰ صِرَاطٍ مُسْتَقِيمٍ [١١:٥٦]

"I put my trust in Allah, my Lord and your Lord! There is not a moving (living) creature but He has grasp of its forelock. Verily, my Lord is on the Straight Path (the truth):' (*Surah Hood* 11 :56)

يُعْرَفُ الْمُجْرِمُونَ بِسِيمَاهُمْ فَيُؤْخَذُ بِالنَّوَاصِي وَالْأَقْدَامِ [٥٥:٤١]

"The *Mujrimoon* (polytheists, criminals, sinners) will be known by their marks (black faces), and they will be seized by their forelocks and their feet:' (*Surah Ar-Rahman* 55:41)

The expression *A lying sinful forelock* reveals a close parallel to the activities executed in the frontal lobe of the brain. So, the Allah specifically points out that the forelock, the front area of the head is the lying and sinning region.

## **Temporal Lobe**

Temporal lobe is associated with emotional experience, responsible for mood elevation, and maintains our sense of self. Some researchers considered temporal lobe as a God-spot or a centre of spirituality. It is a seat of experiencing the divine. Many people report that religion experience have changed their lives may be due to the over-activation of temporal lobe. This neural activation may act as an antenna to make us tune in to the divine. Electro-encephalogram has shown that changing of frequency and amplitude of the brain waves in temporal lobe during spiritual activities and intense prayer. However, neuro imaging studies such as PET (Positron Emission Tomography) and fMRI (Functional Magnetic Resource Imaging) have shown that certain areas of the brain are active during meditation and prayer while other areas in the brain remain inactive. For instance, the prefrontal cortex which is the house of attention centre lights up and the parietal lobe which is the seat of orientation is blanked off.

Some researchers cast doubt on the link between temporal lobe and religiosity and considered it as mental disorder called Temporal Lobe Epilepsy. Temporal lobe epilepsy (TLE) is frequently associated with hyper-religiosity among some individuals. TLE is a condition in which patients experience seizures due to the abnormal activity in the temporal lobe of the brain. These seizures may be simple i.e., without the loss of consciousness or complex i.e., with a loss of consciousness. Individuals with TLE experience religious hallucination i.e., hear divine voices or have divine visions. Some individuals report that they can sense mystic aura before the attack.

Several studies believe that TLE individuals are obsessed with the matters of the spirit. Research carried out in recent years report that TLE individuals show weak magnetic field in temporal lobe which produces sensation that individuals feel as mystical, super-natural and out-of-body experience. And this spiritual experience or the sense of divine may occur due to anxiety, lack of oxygen, low sugar level in blood and fatigue.

## **Effect of the Dhikr and Quran**

As a source of peace of mind, Dhikr and Quran plays an essential role in the lives of Muslims. It is the simplest way to get closer to Almighty and seek peace and love from Him. In recent years, some researchers are actively seeking the connection between religion and science. Several studies have been conducted on meditation states using EEG, ERP, and other neuroimaging studies. The studies found that EEG waves like Alpha and Theta are most active after meditation. However, studies were conducted to find the neurological changes during the recitation and listening to Dhikr and Quran as compared to reading a book. Studies reveal that the EEG power spectrum is high in range of Alpha wave (associated with relaxed state of the brain) at the parietal cortex of the brain during the recitation of Dhikr and Quran in comparison to reading a book. Other studies report that reciting Dhikr and Quran increases the Delta wave in the brain. Delta wave is linked with deep relaxation and spiritual activities and are also used as a therapy in sleeping disorder. Thus, recitation of Dhikr and Quran have calming effect and reduces stress.

## Conclusion

From the presentation of holy verses and scientific analysis of human brain, it could be argued that the Holy Quran is the book of signs what scientists came to know some 60 years before was already mentioned in Quran some fourteen hundred years ago. Allah, the most powerful, at another place says in his holy book:

سُنُرِيهِمْ آيَاتِنَا فِي الْآفَاقِ وَفِي أَنْفُسِهِمْ حَتَّىٰ يَتَبَيَّنَ لَهُمْ أَنَّهُ الْحَقُّ ۗ أَوَلَمْ يَكْفِ بِرَبِّكَ أَنَّهُ عَلَىٰ كُلِّ شَيْءٍ شَهِيدٌ [٤١:٥٣]

"We will show them Our Signs in the universe, and in their own selves, until it becomes manifest to them that this (the Qur'an) is the Truth." (*Surah A/-Fussilat/ 41 :53*)

By concluding, now all the findings so far established in this study, proves the fact there is a great deal to observe what the science today's claims, that have been come down from the heaven in Quran. Without qualms, it could be ascertained that, Quran is a universal book, that have been proven as a source of logic, knowledge, and scientific observation of the world from time to time. The signs, from time to time that the science has proved logical and truthful has already been mentioned in this holy book some fourteen hundred years ago.

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