

HASIL CEK_+1. THE CONCEPT OF \bar{A} Q \bar{L} AND BRAIN IN THE QURAN

by +1. The Concept Of \bar{A} q \bar{l} And Brain In The Quran Suyadi

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THE CONCEPT OF 'AQL AND BRAIN IN THE QURAN AND NEUROSCIENCE: A CONCEPT ANALYSIS OF NĀṢIYAH IN SALMAN'S TAFSIR

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Abstract: The purpose of this study is to analyze the meaning of Nāṣiyah in Tafsir Salman from a neo-scientific perspective. The development of neuroscience and Islamic education in this modern era is in line with the emergence of new findings, namely research about the meaning (Nāṣiyah) in the Quran which some commentators define as "the crown" or, in a neuroscience perspective 'behind the crown', namely the prefrontal cortex. Data of this research are sourced from literature studies through manual and digital searches, focusing on the Nāṣiyah interpretation paradigm in Surah al-'Alaq verses 15-16. Results of the study show that the meaning of Nāṣiyah is identical to the meaning (forehead). In Salman's interpretation, what is meant by the crown is the brain, especially the prefrontal cortex. Therefore, Nāṣiyah is a neurobiological trace of the brain in the Quran. The discovery of the concept of Nāṣiyah as the neurobiological basis of the brain in the Quran will have broad implications for the development of the potential of 'aql (reason) in Islamic education. The essence of Islamic education, of which is the development of the potential of reason as a manifestation of brain function (Nāṣiyah) in the Quran.

Keywords: The Quran; Nāṣiyah; Neuroscience; Islamic Education; Tafsir Salman.

Abstrak: Tujuan penelitian ini adalah menganalisis makna Nāṣiyah dalam Tafsir Salman dalam perspektif neurosains. Perkembangan neurosains dan pendidikan Islam di era modern ini, sejalan dengan munculnya temuan baru, yakni penelitian tentang makna (Nāṣiyah) dalam Al-Qur'an yang oleh sebagian mufassir diartikan sebagai "ubun-ubun" atau dalam perspektif neurosains di balik ubun-ubun, yaitu kortek prefrontal. Data penelitian ini bersumber dari studi pustaka melalui penelusuran manual dan digital, fokus pada paradigma penafsiran Nāṣiyah dalam surat Al-Alaq ayat 15-16. Hasil penelitian menunjukkan bahwa makna Nāṣiyah identik dengan arti ubun-ubun. Dalam Tafsir Salman, yang dimaksud ubun-ubun adalah otak, khususnya kortek prefrontal. Oleh karena itu, Nāṣiyah merupakan jejak neurobiologis otak dalam Al-Qur'an. Penemuan konsep Nāṣiyah sebagai basis neurobiologis otak dalam Al-Qur'an akan berimplikasi secara luas terhadap pengembangan potensi akal dalam pendidikan Islam. Salah satu hakekat pendidikan Islam adalah pengembangan potensi akal sebagai manifestasi fungsi otak (Nāṣiyah) dalam Al-Qur'an.

Kata kunci: Al-Qur'an; Nāṣiyah; neurosains; Pendidikan Islam; Tafsir Salman.

14 Introduction

The main problem in this study is the emergence of a new interpretation of the term "Nāṣiyah" in QS. Al-Alaq [96]: 15-16. In classical commentaries and even some modern ones, Nāṣiyah is interpreted as "the crown." For example, in Al-Maraghi's interpretation, it is stated that Nāṣiyah is interpreted as "the rope of death", meaning that humans are pulled out by Allah SWT through the rope of death (the crown).¹ Meanwhile, in Buya Hamka's Al-Azhar interpretation, Nāṣiyah is interpreted as "the front part of the brain". Quraish Sihab in his interpretation of Al-Misbah also explains that Nāṣiyah is defined as "the crown in his tafsir". Quraish Sihab emphasizes that humans are supervised by Allah SWT through the crown".² However, in contrast to the literature in these various interpretations, Tafsir Salman defines Nāṣiyah as "behind the crown", namely the brain. Therefore, further research on the term Nāṣiyah in Salman's interpretation needs to be analyzed more deeply. From the perspective of Islamic education, accurate interpretation of the term Nāṣiyah has serious implications in the theory and practice of Islamic education.³ The reason is, that the essence of education is to develop all human potential which rests on the brain. Considering that neuroscience is the only science that studies the brain, then its perspective is used to analyze the concept of Nāṣiyah in Salman's interpretation.

It is found that, research on the concept of Nāṣiyah in Ruri and Suyadi's 2020 entitled *Al-Farabi's Multilevel Concept of Intellect* is using the descriptive-analytical approach to Neuroscience. Results of their research

show that according to Al-Farabi, the reason is divided into three parts, namely: 1) God as reason, 2) reason in the philosophy of emanation from one to ten, 3) reason explained in human beings. Besides the results of the study above, it also has a contribution to Islamic Education.⁴ A similar study was also reviewed by Astuti and Suyadi entitled *The Relevance of Ibn Sina's Multilevel Concept of Intellect in a Literature Study Way*. The results of their research showed that according to Ibn Sina, reason is divided into four parts, namely: 1) material reason, 2) talent mind, 3) actual reason, and 4) acquired reason. This study provides an innovative way to develop the potential of students.⁵ Previous relevant research had also been studied by Faiz and Suyadi on "Interpretation of Neuroscience Versus" with an interpretative hermeneutics approach. Results of the research proved that the interpretation of Neuroscience verses can be traced through a study of the concepts of *tafakkur*, *tadabur*, *ta'aul*, and so on. This research becomes a theological normative foundation in the development of critical, creative, and innovative thinking in Islamic education.⁶

Due to this research literature as a novelty to previous research, it becomes an answer or innovation within this sphere. Thereby, this research is different from previous research, because the previous research was only discussed the concept of reason and brain according to a review of Islamic sciences and existing theories at that time. Although those studies were concerned with the interpretation of neuroscience verses, they still seemed to be theoretical, and the implications of Islamic education had not been seen.⁷ Therefore, this research could be considered as the one that raises studies in "the concept of 'Aql and Brain in the Quran and Neuroscience: Concept Analysis *Nāṣiyah* in *Tafsir Salman*" which is dedicated to multidisciplinary Intellectual property rights.⁸

The purpose of this study is to analyze the concept of *Nāṣiyah* in the interpretation of *Tafsir Salam*. This goal is covering three aspects. First, the mind and brain in the Quran and neuroscience. Second, tracing the lines of neuroscience in Islamic thought. Third, is the implication of the concept of *Nāṣiyah* in the interpretation of *Tafsir Salam* on the theory and practice of Islamic education.⁹ Finding traces of Neuroscience in Islamic thought as mentioned above could open up many opportunities within studies of the mind and brain in the perspective of the Quran and Neuroscience in an interactive-collaborative way (Post Integrative).¹⁰ The findings of this study reject the secularists' justification which states that Neuroscience has long been considered a secular science as there is no explicit trace of this in the Quran.¹¹ That is why, this science is underdeveloped in Islamic education because it does not have any formal legitimacy in the sources of

Islamic law related to scientific studies, namely the Quran and Hadith.¹² Thus, the specification of the study of Neuroscience in Islamic Education is now proved to be focused on the concept of reason and brain in the Quran, especially on *fitrah*, *nafs*, *qalb*, spirit, and *'aql* which are related to the meaning of *Nāṣiyah* in the Quran. *Nāṣiyah* does have a brain neurobiological basis in the Quran, which would have broad implications for Islamic Education and Neuroscience nowadays.

This research is based on the argument that in the history of the word, the term *Nāṣiyah* has appeared long before the Quran was revealed while the term brain has only emerged in the 19th century. On this basis, it is natural that classical interpretation has not used a neuroscientific approach to understand *Nāṣiyah* and that Neuroscience has a fairly long scientific history, especially in the tradition of Islamic thought.¹³ The rapid development of Neuroscience can be traced to the treasures of Islamic thought, both classical and modern.¹⁴ These traces can be found in the study of Islamic philosophy, Sufism, and *uṣūl fiqh*. The findings of the Neuroscience tracing rest on the concept of “reason” as the keyword.¹⁵ This concept needs serious attention in Islamic education, considering that studies of these concepts are still normative in the divine metaphysical area, not grounded in the scientific field so it is difficult to implement in the pragmatic *'amaliyah* realm.¹⁶

The method of this research is library research with a qualitative approach.¹⁷ The scientific paradigm applied is an integration-interconnection (Amin Abdullah⁵) which is a dialogue between religion, interpretation, and science. The data sources of this research are literature in the fields of Tafsir The Quran (Tafsir Salman), Islamic Education, and neuroscience. The data collection technique was carried out in a manuscript manner, while the data analysis technique was carried out in a Hermeneutic (interpretative) manner.¹⁸

This study offers an alternative critical analysis of Neuroscience studies in the perspective of the Quran and Hadith as a researcher's contribution to the implications of Neuroscience in the field of Islamic Education, as well as following up the research of Suyadi (Expert of Neuroscience and Islamic Education) in his book “Trace Traces of *'aql* and Brains in The Quran.

Brain and Intellect in Salman's *Interpretation* from a Neuroscience Perspective

Neuroscience studying the brain as something unique is worth like a diamond from the human body, which is understanding the last part

of the functioning of living things which is very perfect because it has implications for all subjects of human life from the atomic level to the global community.¹⁹ Taufiq Pasiak termed Neuroscience as a science that specializes in scientific studies of the nervous system, especially on neurons or nerve cells with a multidisciplinary approach.²⁰ According to him, the brain is only termed when it is associated with the mind (mind).²¹ The main purpose of the study of Neuroscience is to study the biological basis of each behavior. In the context of Islamic education, the study of Neuroscience can be traced to Salman's interpretation as stated in the Quran 96:15-16. This interpretation only examines a few letters contained in the Quran, namely Juz 'Amma. Here, the study is more focused on the short letters that are easy to memorize, study, and use for prayer practices, so the presence of the book of Salman's interpretation makes it easy for the community to apply it.²² Among his studies is to examine the existence of the brain and reason explicitly in the Quran Surah al-Alaq verses 15-16: "Know that if he doesn't stop (doing so) we will certainly pull his crown, that is, the crown that denies and is disobedient (Surat al-Alaq: 15-16).

Salman's interpretation is one of the works of scientific interpretation of leading scientists who devote their knowledge to universities in the Indonesia archipelago especially the Bandung Institute of Technology (ITB).²³ This interpretation was compiled in a book gradually starting from a weekly study held at the Salman ITB mosque led by Yan Origanus started from 2010 to 2011.²⁴ The said book of commentaries is a resume of routine studies that are processed and completed by a team led by Yan Origanus. This is one of the interpretations which is not the same in shape as the interpretations produced by previous scholars. It is an interpretation that only examines a few letters contained in the Quran, namely *Juz 'Amma*.

Statement in Surah al-Alaq confirms one of the many evil infidels who forbid the Prophet Muhammad SAW to pray in the Ka'bah, Know, really if he does not stop (that is) Allah SWT will surely pull *Nāṣiyah* (the front of the head or the crown), namely *Nāṣiyah* of the people who deny and disobey. In the quote from QS. al-Alaq (96): 15-16, the notion of *Nāṣiyah* (forehead) is an understanding intended to refer to the brain. In the history of the word, the term brain was not present in the VIIth century AD or the time when the Quran was revealed, so the Quran used a general term that was understood by the public, namely *Nāṣiyah* or the crown²⁵, while Neurobiologically, the part of the brain behind the crown is the prefrontal cortex.²⁶ This part of the brain is in charge of critical thinking, planning, motivation, and initiation of doing good and bad, including

stating honesty or lies. On this basis, it is possible that what is meant by “*Nāṣiyah*” in QS *al-Alaḳ* (96): 15-16 above is the human brain, especially the prefrontal cortex.²⁷ See the following image:

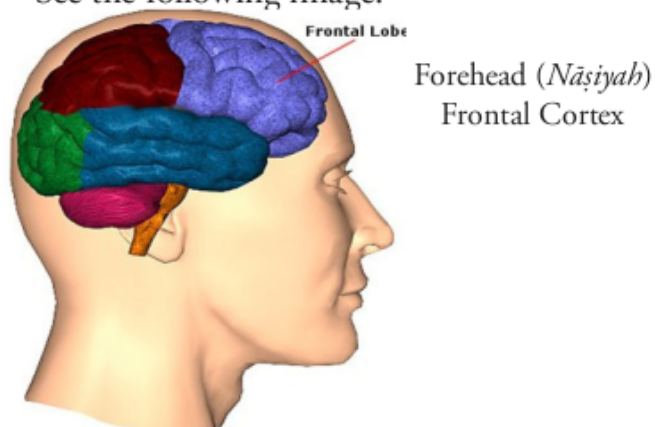


Figure 1. The brain in the Quran.²⁸

In the context of Surah *al-Alaḳ* verses 15-16 which casuistically addressed infidels who interfere with the worship of the Prophet, it is quite natural that the pagan prefrontal cortex is synonymous with cheating and lying. Therefore, in a different context, the brain is not always synonymous with reason, which in the Indonesian dictionary is oversimplified into aligned, subterfuge, rotten reason, and the like.²⁹ Thus, it is the brain (especially the prefrontal cortex) that controls healthy thoughts and good or bad human behavior.³⁰ In Surah *Hud* verse 56 it is stated that all creatures (humans and animals: good and bad) are all controlled through the crown (*Nāṣiyah*).³¹ See the following image:

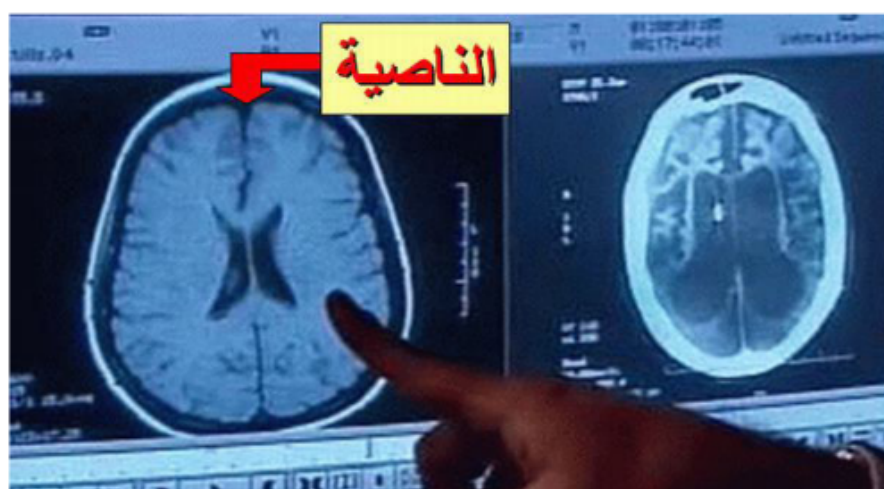


Figure 2. “*Nāṣiyah*” in the Quran.³²

Previously, scientists did not know which part of the brain affects humans to cheating and lying. All assume that false speech in humans arises from just a speech without any stimulus from the brain and is not related to certain parts of the brain. Thus, Muslim scientists refute this argument with relevant research related to *Nāṣiyah*.³³ Many people only know that the function of the brain, in general, is as the center of thought and control of all body systems. However, in line with the rapid development of research, it is proven that the function of the brain is not only as a stimulus tool for the movement of the human body but also as an impetus for someone to lie or lie when referring to the anatomy and physiology of the human brain.³⁴ The prefrontal part that is responsible for the brain is located in the part close to the skull (frontal cortex) *Nāṣiyah*; this part is the one that functions in regulating the planning function and the initiation of movement. In other words, the cerebrum or big brain serves as a planner, driver, and starter of human behavior involved in telling the truth or lying.³⁵ Long before the latest research by anatomists from medical science, Allah Almighty has clearly explained 15 centuries ago in the surah *Al-Alaq*: 15-16.³⁶ It is evident that the word of God which states “the crown of the person who denies and is disobedient” is concerning what is called the big brain, the part of the crown (Cortex Prefrontal) *Nāṣiyah* which demands to do good and bad.

Scientists have long known that the Prefrontal Cortex plays a role in personality formation. The background of this research dates back to 1848, when in a very tragic accident, an iron rod hit the head of a railroad worker named Phineas Gage, stuck his skull 1.25 inches thick and 31/2 feet long, as shown in the following picture:

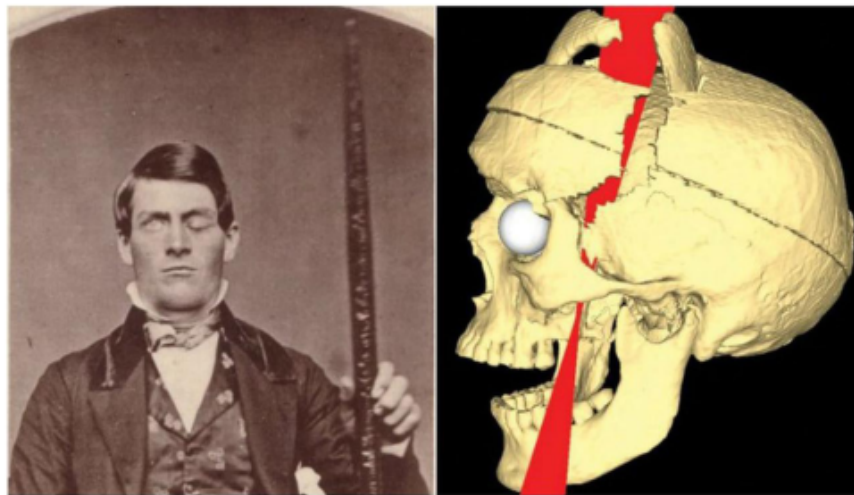


Figure 3. Phineas Gage's “*Nāṣiyah*” iron stuck (Cortex Prefrontal).³⁷

The iron rod entered from under the left eye then came out above the head and heavily destroyed the prefrontal cortex. Phineas survived this trauma, and in general, he can still talk and think. However, the former Phineas was different from the current one. In the aftermath of the accident, he is not the real Phineas like before. Before the accident, Phineas Gage was a professional, competent, best architect, and has an intelligent mind. After the accident, his personality changes into a wasteful, anti-social, liar, dirty talker, has a bad character, and is rigid, who does not survive in his job.³⁸ According to Taufik Pasiak, the prefrontal area is closely related to changes in behavior.³⁹ Dr. Taufik Pasiak also quotes neuroscientist Joseph de Loux, that the prefrontal area functions in managing human emotions. Uncontrolled reactions triggered by the thalamus and amygdala connections can be suppressed by the prefrontal.⁴⁰ According to Safii, the damage to the left prefrontal will make a person anxious and afraid that someone will be too cheerful because the right front is a repository of anger, anxiety, and fear. This emotion is inhibited by the left frontal. This means that the left frontal acts as a bumper for the right frontal.⁴¹

In its development, research in the field of Neuroscience has crossed into the realm of theology (Neurotheology), spirituality (Neurospiritual), to Education (education) Neuroeducation. Among the three developments of Neuroscience, Neuroeducation is the closest to this research. However, neuroeducation is still limited to initiation and research, which was pioneered by John Hopkins University in the form of a consortium of neurologists, psychologists, and artists.⁴² In a more practical educational context, Neuroscience studies focus more on the area of brain-based learning methods, such as Brain-Based Learning, Teaching With Brain Mind, and Arth the Brain in Mind, the learning method by Eric Jensen. How Brain Learns, How the ELL Brains Learn - are both works by David A. Sousa including George Lazanov's Accelerated Learning, Bobby De potter's Quantum Learning, Mel Silberman's Active Learning, and so on. Suyadi as an expert in Neuroscience and Islamic Education believes that in Indonesia, two books are relatively popular, namely Genius Learning by Adi W. Gunawan and Smart Learning; Brain-Based Learning, by Jalaluddin Rakhmat,⁴³

Tracing the Footprints of Neuroscience in Islamic Thought

The rapid development of Neuroscience and its recent expansion into various fields did not occur suddenly. If traced historically, Neuroscience has a fairly long scientific history, especially in the tradition of Islamic thought. That is, the rapid development of Neuroscience can be traced to

the treasures of Islamic thought, both classical and modern. These traces can at least be found in the study of Islamic philosophy, Sufism, and *uṣūl fiqh*. The findings of the Neuroscience trial search are based on the concept of “reason” as the keyword.⁴⁴ Both the study of Islamic philosophy, Sufism, and *uṣūl fiqh* and other fields of scientific study may have the concept of reason in it, although using different terms. The study of philosophy related to the concept of reason is an emanation theory. The study of Sufism related to reason is *insān kāmil*, including (*aql, nafs, qalb, and ruh*).⁴⁵ The study of *uṣūl fiqh* related to reason is *maqosid shari’ah*, especially *Hifz ‘aql*. If the imprint of Neuroscience in Islamic thought is read with the distance of Education and Neuroscience of Sashank Varma, then its position is in the metaphysical realm of the Divine.⁴⁶

1. Imprints of Neuroscience in Islamic Philosophy

Suyadi divides the tracing of Neuroscience in Islamic philosophy into three eras, namely: 1) the era of theology, 2) the era of astronomy, and 3) the era of brain mi.⁴⁷ The traces of Neuroscience in the era of theology are marked by debates on the role of reason and revelation.⁴⁸ The traces of Neuroscience in the era of brain mi are marked by the discourse on the hierarchical reasoning of the philosophers and the findings of the god spot/god circuit by psychologists and neurologists.⁴⁹ Philosophers through the concept of emanation say that humans can relate to God through the emanation of their mind, God Spot states that humans can relate to God through certain points on the brain, God Circuits states that humans can relate to God through various brains; it can be concluded that theology Islam (emancipation) has a Neurobiological basis on the God Spot or God Circuit. This is the imprint of Neuroscience in Islamic philosophy.⁵⁰

2. Traces of Neuroscience in the Study of Sufism (Insān kāmil)

In the Sufism discourse, the search for traces of Neuroscience can be carried out through the concept of *insān kāmil* by inductive and verification. In this case, the concept of *insān kāmil* (perfect human) in the study of Sufism is supported by the concept of intelligent humans (multiple intelligences) in the study of Neuroscopy and then abstracted metaphysically by *al-asmā’ al-ḥusnā*.⁵¹ Thus, if *insān kāmil* and multiple intelligences identification state that a perfect human is a unique human who develops all of his potentials, multiple intelligence objectification and *al-asmā’ al-ḥusnā* conclude that a perfect human is a human who develops 99 bits of intelligence.⁵² Although this argument is still normative-metaphysical and requires its own more specific research, this view can

be a variant of the integration (induction) in Islamic education and neuroscientist, especially *insān kāmil* and multiple intelligences.⁵³

3. Neuroscience Traces in *Uṣūl Fiqh*, *Maqāṣid al-Sharī'ah* (*Ḥifẓ al-'Aql*)

The study of *Uṣūl Fiqh* related to Neuroscience is the *maqāṣid of Sharī'a*, especially *ḥifẓ al-'aql* (maintaining reason). The argument is that both the 'aql is the study of *uṣūl fiqh*, and the brain in the study of neuroscience -both lead to normal thinking (common sense).⁵⁴ In many cases, Islamic law only applies to a Muslim who has common sense, including *balīgh*, in the definition of being able to think.⁵⁵ The same thing happens in the study of Neuroscience. Initially, Neurosians (neurology) focused more on studies on brain disorders or diseases. In its development, the study of Neuroscience explores the potential of the brain more.⁵⁶ The three traces of Neuroscience in Islamic thought, both originating from the study of Islamic philosophy (Emancipation and God Circuits / God Spot), Sufism (*insān kāmil*, *al-asmā' al-ḥusnā*, and multiple *entlegences*), and *uṣūl fiqh* (*ḥifẓ al-'aql*) (maintaining reason, Neurology, and brain potential development) will have implications for empirical-scientific scientific findings.⁵⁷ If the three traces of Neuroscience in Islamic studies above are tabulated, they will appear as follows:

Table 1. Imprints of Neuroscience in Islamic Thought.⁵⁸

Imprints of Neuroscience in Islam	Theological Era	Astronomy Era	Brainomy era
Philosophy	Reason and Revelation	Emancipation	God Spot and God Circuits
Sufism	<i>Kāmil</i>	<i>al-asmā' al-ḥusnā</i>	Multiple Intelligences
Usul Fiqh	<i>ḥifẓ al-'aql</i>	<i>ḥifẓ al-'aql</i>	Brain Potential

Based on the traces of Neuroscience in Islamic thought as tabulated above, it can be concluded that conceptually, Neuroscience has traces in Islamic thought with three studies, namely philosophy (emancipation), Sufism (*insān kāmil*), and *uṣūl fiqh* (*ḥifẓ al-'aql*). Then, in a post-structuralist Hermeneutic discussion with an emphasis on the meaning of creativity,⁵⁹ Neuroscience traces in Islamic thought will be clearer if viewed periodically, namely from the era of theology, astronomy, and brainomy.⁶⁰

Implications of the *Nāṣiyah* (Brain) Concept in Salman's *Tafsir* on Islamic Theory and Education

The essence of Islamic education, in addition to the transfer of values and knowledge, is the optimization of all human potential.⁶¹ Most of the human potential rests on the brain. The science that studies the brain exists is called Neuroscience. Therefore, Islamic Education and Neuroscience can be hybridized.⁶² The hybridization of Islamic Education and Neuroscience has the potential to find varieties of new branches of science called in the term of Islamic Education Neuroscience or a kind of Islamic educational neuroscience.⁶³ The variety of this new branch of science (Islamic Education Neuroscience) has the potential to become a scientific branch that is equivalent to other scientific branches, such as the philosophy of Islamic education, psychology of Islamic education, and anthropology-sociology of Islamic education. Islamic Education Neuroscience can also be positioned as one of the “products” of scientific integration studies as Abdullah's theory, but specific to only two fields of science, namely Islamic Education and Neuroscience.⁶⁴

Neuro means nerves, and science means science. Neuroscience is knowledge of the future, a knowledge whose multilevel complexity is too challenging and fascinating because it relies on reason or the brain as the heart of activity.⁶⁵ The brain or Mantik forms a diamond from the throne of the human body.⁶⁶ Members of the body not only humans, but animals also have it. When the mind acts and between the actions of the mind, it is assumed that the brain or logic that acts or plays a role is contained in the power of thought. A person who has no sense is someone who does not use his brain to think. Mantik can be associated with an important trait of developing brain potential in Neuroscience.⁶⁷ The verse that relates to the brain is the crown in the Quran Surah Al-Alaq (96): 15-16. The brain or mental activity is regulated as a thinking power. Well, this is what distinguishes between humans and animals, and humans and humans, “*al-insān ḥayawān nāṭiq*, humans are animals that think” the brain without reason - he will not be able to understand as well as spoken or written since 14 decades. See The Quran Surah Al-Anfal (8): 22.

In general, the brain's structure consists of two hemispheres (right and left) that control various brain functions such as thinking, abstraction, and language.⁶⁸ According to Suyadi, the anatomy of the brain which is divided into two is only the big brain or what is called the forebrain, not the whole brain itself.⁶⁹ The brain forms lobes, outside the brain. Then in the middle, there is the thalamus, which is a clump of sensory nerves from all over the body that transfers information to other parts of the brain.⁷⁰

You can see the image of the structure of the brain below:

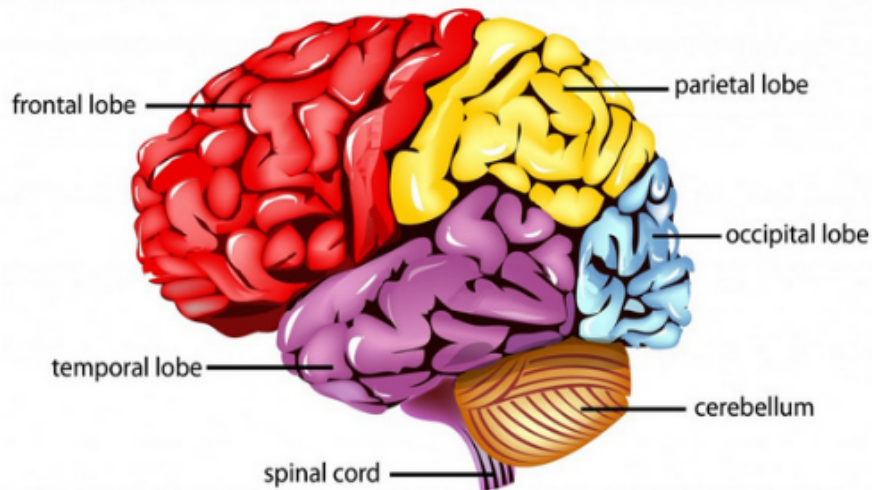


Figure 4. Structure of the Human Brain.⁷¹

The frontal lobe is the leading part in the structure of the cerebrum or the part of the brain located behind the forehead. The frontal lobe functions in recognition of speech, movement, memory, behavior, personality, emotion, and intellectual functions, such as reasoning, thought processes, problem-solving, planning and decision making, intellectual processes, and interactions. The occipital lobe is the most posterior part of the cerebrum.⁷² Associated with human vision (visual), so that the body can distinguish various things seen by the eye.⁷³ And its function is to receive, process, and translate sensory information. The parietal lobe is part of the structure of the cerebrum which is located in the middle. Responsible for the human senses.⁷⁴ Functions to control spatial orientation (understanding of shape, size, and direction) and control sensations, such as pressure, touch, pain, and temperature. The temporal lobe is part of the structure of the cerebrum located on the right and left sides of the brain. And its function is to regulate sensory input, production of language and speech, perception of driving, and memory.⁷⁵

Reasoning proceeds through the mediation of the intensity that exists between reasoning which receives the dexterity to reach the images of entities that are often obtained for the five senses, restoring these entities into his mind while remembering the foreign images of the images of these entities.⁷⁶ The explanation obtained by the power of thought is reserved in 2 arrangements in the form of effective and non-effective energy. The form of the described explanation is the number of nerve impulses transmitted for the axons per second.⁷⁷ According to Suyadi, neuroscience is the science

9 of the brain or the science of thinking, including critical and creative thinking, to produce innovative and credible works.⁷⁸ According to al-Ghazali, metaphysical concepts in Islam, such as *fitrah*, *spirit*, *qalb*, *nafs*, and all have two definitions, namely biologically and metaphysically.⁷⁹ The concept of *nafs*, for example, is understood as (a) the forces that drive anger and (b) the vices of human beings.⁸⁰ Likewise, with other metaphysical concepts, all are interpreted as having two dimensions. In the context of education, al-Ghazali provides more ways how to maintain *fitrah*, maintain the spirit and *qalb*, control the *nafs* and use 'aql.⁸¹

8 Conclusion

Based on the results of research and discussion, it turns out that conceptually the mind and brain have traces of Islamic thought based on the discourse of Neuroscience and Islamic education. These traces have implications for the realm of philosophy, Sufism, and *uṣūl fiqh*. The study of philosophy leads to emancipation, Sufism to *insān kāmil* (the perfect man), and *uṣūl fiqh* known as *ḥifẓ al-'aql* (guarding reason). These findings can be traced to Neuroscience and Islamic education which relies on the concept of «reason» as the keyword, based on philosophical studies of Islamic education in the *ilāhīyah* metaphysical area and Neuroscience in the scientific field. Neuroscience and Islamic education have lines of a neurobiological basis that can be traced in the interpretation of Salman as stated in the Quran Surah Al-Alaq verses 15-16 which is the keyword «*Nāṣiyah*» (the crown). In other words, it is the Prefrontal Cortex that influences human behavior in being honest and lying. This study may have limitations, maybe in the research's content and substance in studying Neuroscience and Islamic Education. Therefore, the researcher recommends that further research be carried out to find a more comprehensive study, to yield better examples of Neuro-Hermeneutics, and Neurospiritual, within the study of Islamic education and scientific experimentation.

Endnotes

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