Pakistan Journal of Criminology
Vol. 16, No. 03, July—September 2024 (729-746)

Neuroscience and Islamic Law: Contemporary Perspectives

Pidari Sinaga[1], Yusriyadi Yusriyadi[2],
Ana Silviana[3] & Zico Junius Fernando[4]

Abstract

Neuroscience and Islamic law intersect in a novel way, providing insights into the biological underpinnings of behavior and how they relate to the legal norms governing Muslim life. This study employs normative legal research, utilizing a variety of approaches, including conceptual, comparative, historical, and futuristic, to explore how brain function influences adherence to or deviation from Islamic law. This study aims to understand the motivations behind actions that comply with or contravene Islamic principles by analyzing how the brain responds to stimuli. Additionally, it delves into the concepts of responsibility and justice within Islamic jurisprudence, examining the impact of neurological conditions on an individual's accountability. Using content analysis to categorize legal materials, this study describes and prescribes ways in which a deeper understanding of neuroscience could inform legal decisions in complex cases. The goal is to gain a more thorough understanding of human behavior in the context of law and its broader implications for Muslim societies, potentially guiding the development of a legal system that integrates individuals' biological, psychological, and moral dimensions.

Keywords: Neuroscience, Islamic law, Brain and Behavior, Contemporary

Introduction

In this modern era, the development of science and technology has significantly impacted various aspects of life, including law and religion.(Apriani Zarona Harahap et al., 2021) Neuroscience, a branch of science currently developing rapidly, provides a new understanding of how the human brain works, influences behavior, and interacts with the surrounding environment.(Bush & Tussey, 2013) The contribution of neuroscience to law has begun to be recognized, for example, in the context of criminal law, where understanding human behavior from a neuroscience perspective can provide a new understanding of legal responsibility.(Aharoni et al., 2013) Neuroscience also helps to understand the extent of individual freedom in making decisions, an essential concept in determining legal responsibility.(David E. J. Linden et al, 2021)

[1]Fakultas Hukum, Universitas Diponegoro, Semarang, Indonesia, pidarisinaga.law@gmail.com
[2]Fakultas Hukum, Universitas Diponegoro, Semarang, Indonesia. yusriyadi@lecturer.undip.ac.id
[3]Fakultas Hukum, Universitas Diponegoro, Semarang, Indonesia. silvianafhundip@gmail.com
[4]Fakultas Hukum, Universitas Bengkulu, Bengkulu, Indonesia. zjfernando@unib.ac.id

On the other hand, Islamic law, as a legal system that has existed for a long time, has a vital role in regulating the lives of Muslims in various parts of the world.(Jones, 1992) Islamic law has its principles and ethics that govern various aspects of life, including morals, laws, and social behavior.(Fletcher, 2006) However, the interaction between neuroscience and Islamic law is still an under-explored area. This raises the question of how neuroscientific findings and concepts can be understood and applied within the framework of Islamic law. Furthermore, what challenges and opportunities may arise in integrating these two fields is another interesting question to research.

This study aims to bridge the gap between neuroscience and Islamic law, focusing on how principles and concepts in neuroscience can be understood and applied in the context of Islamic law, and how this understanding can impact legal practice in contemporary Islamic society. To achieve this goal, this study will start by understanding the basics of neuroscience and how its main concepts work. This will include understanding how the brain works, how brain processes affect human behavior, and how the brain interacts with its environment.(Morse, 2015) This research will also examine how neuroscience has been applied in general legal contexts, such as criminal law. It will explain how neuroscience's understanding of human behavior and decision-making can influence legal accountability and punishment.(David E. J. Linden et al, 2021)

After understanding neuroscience and its applications, this research will explore how these concepts and findings can be applied to Islamic law. It will involve exploring Islamic legal texts and contemporary interpretations of Islamic law to see how new understandings of the brain and human behavior can be translated into this context. This research will also look at how this understanding can assist in applying and interpreting Islamic law, particularly in modern Islamic societies. This will include a discussion of how new understandings of the brain and human behavior can aid in determining Islamic laws and punishments, as well as how this can impact legal practice in Islamic societies. This research will identify the challenges and opportunities in the integration process of neuroscience and Islamic law. It will include an explanation of how differences in approach and understanding between science and religion can be overcome, as well as how these two fields can influence and inform each other for the benefit of Islamic society and society at large.

Method

Research with the title "Neuroscience and Islamic Law: Contemporary Perspective" the method uses normative research.(Fletcher, 2006) This method is suitable for this study because the main focus is on the existing norms, principles, and laws in the context of Islamic law and how they interact with concepts and discoveries in neuroscience. This type of research is also referred to as documentation research because the majority of the data sources needed come from legal documents such as laws, legal journals, legal dictionaries, legal research reports, and court decisions in the library.(Hatta et al., 2019) This study will be descriptive-prescriptive in that it will describe the status quo between neuroscience and Islamic law and provide recommendations on how these two fields can be better integrated in the future.(Sirman Dahwal et al, 2020) Analytical content will deepen it and produce a more comprehensive and detailed understanding of how neuroscience and Islamic law interact and influence one another.(Fernando, Rosmanila, et al., 2023)

Understanding the Brain in the Context of Sharia: Interpretation of Neuroscience in Islamic Law

Neuroscience, the branch of science that studies the brain and nervous system, has made important discoveries about how humans perceive and interact with the world.(Tigano et al., 2019) On the other hand, Islamic law, or Sharia, is the legal framework that regulates the lives of Muslims based on the Qur'an and Hadith. In this context, it is essential to understand how the findings and concepts of neuroscience can be translated and understood in the context of Sharia.

According to neuroscience, the human brain is the center of all mental activity and processes, including emotions, thinking, and behavior.(Rivalina, 2020) This affects the way humans understand and interact with the world around them.(Amelia et al., 2020) Islamic law, reason, intention, and freedom of decision-making are vital in determining legal responsibility and accountability. Concrete examples of the relationship between neuroscience and Islamic law can be seen in discussions about intentions and actions. In Islamic law, intention has an important role. According to Amirul Mukminin, Abu Hafsh 'Umar bin Al-Khattab radhiyallahu 'anhu said that he heard the Prophet sallallaahu 'alaihi wa sallam say:

> *"Verily, every deed depends on its intention. Everyone will get what he intends. Whoever makes hijra for the sake of Allah and His Messenger, then his hijra is for Allah and His Messenger. And whoever makes hijra for the sake of the world or for the sake of the woman he marries, then his hijra is for the sake of what he is aiming for." (Narrated by Bukhari and Muslim)*

On the other hand, neuroscience has shown that the brain plays a role in forming intentions and influencing actions.(McCay & Kennett, 2021) With this understanding, humans can see how neuroscience's understanding of the brain and mental processes can provide new insights into how intentions and actions are understood in Islamic law. For example, knowing how the brain processes information and makes decisions can provide new insights into how intentions are formed and how this can influence legal accountability in Islamic law. In addition, knowledge of how the brain influences emotions and behavior can provide new insights into how emotions and behavior are understood in Islamic law. For example, in Surah Ar-Rum Verse 22:

> *"And among His signs is the creation of the heavens and the earth and the diversity of your languages and the colors of your skin. Verily in that there are signs for those who know."*

It is stated that differences in language and color are a sign of Allah's greatness, indicating that individual differences, including emotions and behavior, are recognized and valued in Islam. Neuroscience knowledge of how the brain influences emotions and behavior can provide new insights into how these differences can be understood and accepted in Islamic law.

This understanding can also influence how laws and punishments are determined in Islamic law. For example, knowing how certain brain conditions or disorders affect a person's behavior can provide new insights into how punishments and legal liability are determined. For example, suppose someone has a brain disorder that affects their ability to make decisions or understand the consequences of their actions. In that case, this can affect how they are tried and punished under Islamic law.

Apart from that, neuroscience knowledge can also provide new insights into how Islamic law can be applied and understood in modern society. For example, knowledge of how the human brain interacts with technology can provide new insights into how Islamic law can be applied in the context of modern technology.(Ienca, 2021) For example, how are privacy and copyright laws applied to social media and the Internet? However, it is essential to note that while neuroscience can provide new and valuable insights, this does not mean that all neuroscience discoveries or concepts can or should be automatically applied to Islamic law. Islamic law has its principles and ethics, and it is essential to ensure that the translation of neuroscience concepts and findings into this context is done with care and respect for these principles. For example, Surah Al-Isra verse 36 states.

This understanding can also influence how laws and punishments are determined in Islamic law. For example, knowing how certain brain conditions or disorders affect a person's behavior can provide new insights into how punishments and legal liability are determined. For example, suppose someone has a brain disorder that affects their ability to make decisions or understand the consequences of their actions. In that case, this can affect how they are tried and punished under Islamic law.

Apart from that, neuroscience knowledge can also provide new insights into how Islamic law can be applied and understood in modern society. For example, knowledge of how the human brain interacts with technology can provide new insights into how Islamic law can be applied in the context of modern technology:

> *"And do not follow something that you do not know. Because of hearing, sight and conscience, they will be held accountable."*

This verse reminds us of the importance of knowledge and judgment in all actions and decisions, including in translating and applying new knowledge, such as neuroscience in Islamic law. Thus, neuroscience's understanding of the brain and mental processes can provide new and valuable insights into how the laws and principles of Islamic law are understood and applied. However, it is essential to ensure that this is done in a manner that respects the principles and ethics of Islamic law and has a clear understanding of the context and boundaries of each field of knowledge.

In addition, knowledge of neuroscience can also influence the understanding of the concept and practice of worship in Islamic law. For example, neuroscience has shown that the human brain can change and adapt throughout life, a concept known as neuroplasticity.(Gynther et al., 1998) In the context of worship, this understanding can provide new insights into how worship and other religious practices can affect the brain and a person's mental and emotional well-being. For example, several studies in neuroscience have shown that meditation and prayer can positively affect a person's brain and mental health. In Surah Ar-Ra'd verse 28, it is stated:

> *"(namely) those who believe and their hearts find rest in the remembrance of Allah. Remember, only by remembering Allah will the heart find peace."*

This verse shows that worship and remembrance of Allah can bring peace and tranquility, a concept supported by neuroscientific findings about the positive effects of prayer and meditation. It can also provide new insights into how worship and other religious practices can be adapted or modified to meet specific

individual needs and conditions. For example, knowledge of how certain brain conditions or disorders can affect a person's ability to worship or participate in other religious practices can be used to develop new or alternative ways of worship that suit their needs and circumstances.

Neuroscience can offer fresh insights into the application and understanding of Islamic law by examining how the brain and mental processes influence behavior. However, it is critical to carefully integrate neuroscience findings into Sharia law, respecting its principles and ethics. Sharia, derived from Islamic teachings, encompasses morals, laws, ethics, and spiritual values, guiding various aspects of daily life. Adhering to these principles is not only an obligation for Muslims but also essential for living in accordance with Islamic teachings. By respecting the ethical and moral values of Sharia, neuroscience and Islamic law can synergistically enhance understanding and help Muslims apply these teachings effectively in their lives.(Bratton, 2018)

The Interaction Between Neuroscience and Islamic Law: Challenges and Opportunities in Integration

Integrating knowledge from neuroscience and Islamic law is challenging but also holds many opportunities. On the one hand, there is a challenge in ensuring that neuroscience knowledge integrated into Islamic law is separate from the basic principles and beliefs of this religion. On the other hand, there is an excellent opportunity to increase the understanding and practice of Islamic law by adding new perspectives and knowledge from neuroscience. One of the main challenges in this integration is ensuring that neuroscience knowledge remains the same as the view of Islamic law regarding humans and the universe. In the Qur'an (95:4), it is stated:

"*Indeed, we have created human in the best form."*

This verse describes the Islamic view of human dignity and uniqueness, which must be respected and protected. Therefore, it is essential to ensure that the knowledge of neuroscience is not used to reduce humans to a series of biological or chemical processes in the brain.

Instead, neuroscience knowledge should be used to add to and deepen the understanding of Islamic law about humans and the world. For example, neuroscience knowledge about how the brain processes information and makes decisions can provide new insights into concepts such as intention and accountability in Islamic law. With knowledge of neuroscience, humans can have a deeper understanding of how intentions are formed in the brain and how this can affect one's actions and responsibilities under Islamic law. In addition, the

integration of neuroscience and Islamic law also holds opportunities to broaden and enrich the ways in which Islamic law is applied and understood in modern society. For example, neuroscience knowledge of how the brain interacts with technology can be used to provide new insights into how Islamic law can be applied in modern technological contexts, such as the use of social media or the Internet. However, it is essential to ensure that this integration is carried out in a way that respects the basic principles and values of Islamic law. For example, Surah Al-Isra verse 36 reminds us:

> *"And do not follow what you have no knowledge of. Truly hearing, sight, and heart, all of that will be held accountable."*

This verse emphasizes the importance of the knowledge that is considered and responsible for all actions and decisions, including the integration of new knowledge, such as neuroscience, into Islamic law.

The interaction between neuroscience and Islamic law also provides an opportunity to better understand and respond to the contemporary challenges faced by Muslim societies. For example, neuroscience knowledge of mental and psychological disorders can assist in developing a more sensitive and inclusive approach to Islamic law regarding mental health issues. Surah Al-Insyirah, verses 5 and 6, say:

> *"Verily, with hardship there is ease, indeed, with difficulty, there is ease."*

Combining neuroscience knowledge can assist in identifying 'difficulties' in mental health contexts and formulating 'conveniences' in more effective forms of legal and social support.

Furthermore, this integration also provides an opportunity to bridge the gap between religion and science in contemporary society. In many ways, religion and science are often seen as two opposing or even conflicting fields. However, in Surat Al-Ankabut, verse 20, Allah says:

> *"Say: 'Walk on the earth, then watch how Allah created (creatures) the first time. Then Allah created the last life. Surely Allah has power over all things."*

This verse shows that science and knowledge about Allah's creation are valued and encouraged in Islam. By integrating neuroscience and Islamic law, humans can formulate new ways of understanding and applying Islamic law that reflect human life's complex and varied realities. Furthermore, humans can demonstrate how religion and science can work together to provide deeper and richer insights and understandings about the world and the human place in

it.(Schacht, 1965) However, it is essential to remember that human knowledge is always limited and must always be balanced with humility and awareness of the greatness and mystery of God. As stated in Surah Luqman verse 27:

> *"And if all the trees on earth became pens and the oceans (turned into ink), plus seven more seas after that, the words of Allah would not run out. Indeed, Allah is Mighty, Most Wise."*

In exploring the interaction between neuroscience and Islamic law, one also needs to know that while neuroscience provides deep biological and psychological insights into the human brain and its behavior, Islamic law looks at humans from a more holistic and spiritual perspective. Therefore, respecting and maintaining this balance through an integrative approach is essential.

For example, in responding to challenges in the field of mental health, apart from applying neuroscience knowledge, Islamic law also emphasizes the importance of spiritual and community support. In the Hadith of Rasulullah SAW, narrated by Muslims, he said:

> *"There is no sick among Muslims who are sick then he is patient with the pain, but Allah will erase his sins like a tree whose leaves fall: (HR Muslim)*

In an effort to integrate neuroscience and Islamic law, it is not only enough to see how the brain works from a biological perspective but also how Islamic spiritual teachings can support and complement understanding and knowledge. This integration not only provides an opportunity to combine two different fields of knowledge but also provides an opportunity to broaden and deepen them.

Finally, one of the most significant opportunities in integrating neuroscience and Islamic law is how it can help humanity better understand and respond to the ethical and social challenges arising from new knowledge and technology. For example, neuroscience's knowledge of the brain and mental processes can influence how to understand and deal with issues such as privacy, consent, human rights, and justice in the context of new technologies and knowledge developments.(Pernu & Elzein, 2020)

For example, the Hadith of the Prophet Muhammad, which Al-Bukhari and Muslims narrated, says, "Every one of my people will be forgiven except for those who commit blatant sins." This hadith can help us understand the importance of privacy and individual rights in the context of neuroscience and new technologies, and how Islamic law can help us formulate a just and ethical response to these challenges.

Evolution and Adaptation: The Role of Neuroscience in the Future of Islamic Law

Islamic law's understanding and practice have evolved and adapted over time, changing social, cultural, and scientific contexts. The integration of neuroscience into Islamic law has staged this process of evolution and adaptation in an innovative way and has the potential to change the way Islamic law is understood and applied in the future. Evolution is a gradual change over time, while adaptation involves changes or adjustments that allow a system or organism to survive and thrive in a new environment or situation.(Laszlo, 1997) In the context of Islamic law, evolution can be seen in how the understanding and practice of Islamic law have changed and developed since the time of the Prophet Muhammad. In contrast, adaptation can be seen in how Islamic law has responded and adapted to changing contexts and challenges throughout history.

Integrating neuroscience into Islamic law demonstrates this potential for evolution and adaptation in several ways. First, neuroscience provides new insights and knowledge about the human brain and mental processes that can provide a new understanding of concepts and practices in Islamic law. For example, neuroscience knowledge about how the brain processes information and makes decisions can provide new insights into concepts such as intention and accountability in Islamic law. In Surah Al-Isra's verse 36, Allah says:

> *"And do not follow what you have no knowledge of. Verily hearing, sight, and heart, all of that will be held accountable."*

With this new understanding from neuroscience about how the human brain works, humans can better understand how they process information, make decisions, and are ultimately responsible for actions in Islamic law.

Second, integrating neuroscience into Islamic law can assist in responding to and adapting to new challenges and opportunities arising from technological and knowledge developments. For example, neuroscience's understanding of how the brain interacts with technology can assist in formulating and applying Islamic law in the context of modern and digital technology. In Surah An-Nahl verse 78, Allah says:

> *"Allah brought you out of your mother's belly in a state of not knowing anything, and He gave you hearing, sight and heart (mind), so that you are grateful."*

The Hadith of Rasulullah SAW, narrated by Bukhari, says: "There is nothing better for humans than reason." Through neuroscience, humans can formulate new

ways to understand and apply Islamic law that reflect how the brain interacts with the world and technology while maintaining the value and the basic principles of Islamic law. In addition, in the context of new knowledge and ethical challenges arising from neuroscience and related technologies, Islamic law has a vital role in helping Muslim societies formulate ethical and responsible responses. For example, in Surah Al-Hujurat, verse 6, Allah says:

> *"O you who believe, if a wicked person comes to you with news, then examine it carefully, so that you do not inflict a calamity on a people without knowing the circumstances that cause you to regret what you did."*

This verse shows the importance of knowledge, wisdom, and responsibility in responding to new information and changes.

Integrating neuroscience and Islamic law also offers opportunities to develop new approaches to education and learning in Islamic law. Neuroscience can provide insight into how the brain learns and how best to teach and learn Islamic law effectively and meaningfully. In the Hadith of Rasulullah SAW, narrated by Bukhari and Muslim, he said: "Whoever takes a path to seek knowledge, Allah will make it easy for him to find heaven."

Finally, the integration of neuroscience into Islamic law provides an opportunity to promote dialogue and collaboration between science and religion. In many ways, science and religion are often seen as two opposing or even conflicting fields. However, in Surah Al-Baqarah verse 269, Allah says:

> *"He gives wisdom to whom He wills, and whoever is given wisdom, then indeed he has been given a lot of virtues. And no one can take lessons (from him) except those who are intelligent."*

Thus, the role of neuroscience in the future of Islamic law is part of a continuous process of evolution and adaptation and reflects Islam's commitment to knowledge, justice, and human progress.

Third, incorporating neuroscience into Islamic law can contribute to a more informed and evidence-based decision-making process in a legal and ethical context. For example, neuroscience's understanding of how the brain works can influence how humans understand and evaluate concepts such as consciousness, mental capacity, and moral and legal responsibility, all of which have important implications for Islamic law. Concrete examples can be seen in determining laws related to mental health conditions in Islamic law. Knowledge gained from neuroscience can assist in providing evidence and a better understanding of mental health conditions, which can then influence the way Islamic law understands and responds to these issues. For example, in Surah An-Nisa's verse 59, Allah says:

"O you who believe, obey Allah and obey the Messenger (His), and ulil amri among you. Then if you differ in opinion about something, then return it to Allah (Al Quran) and His Messenger (sunnah), if you are right - truly believe in Allah and the Last Day. That is more important (for you) and better the consequences ".

Hadith of the Prophet Muhammad narrated by Bukhari and Muslims: "No fatigue, no pain, no worry, no sadness, no hardship, and no distress befalls a Muslim, even to the thorns that stab him, but Allah will erase some of his mistakes because of it.

The Influence of Neuroscience on the Understanding and Practice of Contemporary Islamic Law

Neuroscience, as the study of the nervous system, provides profound new insights into how the human brain works.(Borbón, 2022) Advances in this field have opened up many opportunities to understand the self and the human world.(McWilliams et al., 2020) Within Islamic Law, Neuroscience has the potential to influence and shape contemporary understanding and practice in several ways.(Meynen, 2019)

First, neuroscience helps clarify how the human brain processes information and makes decisions. This has the potential to influence how we understand and apply concepts in Islamic law. For example, "intention" is fundamental in Islamic law. Neuroscience has shown that the decision-making process in the brain involves multiple areas and systems, which can help better understand how intentions are formed and how this can be accounted for in Islamic law. Surah Al-Baqarah, verse 284, Allah says:

"To Allah belongs all that is in the heavens and whatever is on the earth. And if you give birth to what is in your heart or you hide it, surely Allah will make an account with you about your actions. So Allah forgives whom He wills and tortures whom He wills; and Allah has power over all things."

Return all the contents of your heart to Allah. This understanding can be deepened with neuroscience knowledge about how the brain forms intentions and how feelings and thoughts influence decision-making processes.

Second, neuroscience can provide insight into how the human brain develops moral and ethical values.(Chandler et al., 2019) This is important in Islamic law, a legal system based on ethics and moral values. Neuroscience has shown that there are areas of the brain involved in moral understanding and judgment, and this can help humans better understand how moral and ethical values are acquired and how

this influences behavior.(Anderson & Kiehl, 2020) The hadith of the Prophet Muhammad, narrated by Bukhari, reads, "Indeed, what is lawful is clear and what is unlawful is clear, and between the two of them, there are vague matters (sunhat) that many people do not know. Whoever protects himself from doubtful matters, then he has guarded his religion and his honor".

With knowledge from neuroscience, humans can better understand how the human brain processes and evaluates moral information and how this influences behavior, which in turn can assist in understanding and applying Islamic law in a more effective and evidence-based way. Third, neuroscience can help us better understand how humans learn and remember information, which can influence how humans teach and learn Islamic law. The Al-Quran repeatedly emphasizes the importance of learning and seeking knowledge, as in Surah Al-'Alaq verses 1–5, which read: "Read in (mentioning) the name of your Lord who created; He has created man from a clot of blood; read, and your Lord Who created Most Gracious,

Likewise, the Hadith of Prophet Muhammad SAW, narrated by Bukhari and Muslims, reads, "Seeking knowledge is an obligation for every Muslim." With knowledge from neuroscience about how the brain learns and remembers information, humans can develop more effective teaching and learning methods for Islamic law, which in turn can assist in enhancing the understanding and application of Islamic law.

Fourth, neuroscience can provide insight into mental health conditions, influencing how Islamic law understands and responds to these issues. For example, depression and anxiety are common mental health conditions that can affect a person's capacity to understand and comply with Islamic law. Knowledge from neuroscience about these conditions and how they affect the brain and behavior can assist in the development of more informed and empathetic responses in Islamic law. For example, in the Hadith of the Prophet Muhammad, narrated by Bukhari and Muslims, Rasulullah SAW prayed, "O Allah, I seek refuge in You from weakness, laziness, fear, and bad mentality." This hadith acknowledges the reality and impact of mental health conditions, as well as the importance of praying and seeking protection. As such, neuroscience has significant potential to influence and shape the contemporary understanding and practice of Islamic law. Through better knowledge and understanding of the human brain and its workings, humans can develop a more informed, evidence-based, and empathetic understanding and practice of Islamic law.

Fifth, an understanding of neuroscience can assist in interpreting and applying Islamic laws in a broader context. Islamic law involves interpreting and applying religious teachings in various aspects of life, including family law,

criminal law, civil law, and business ethics. By understanding how the brain works and human behavior from a neuroscience perspective, humans can have better insight into applying Islamic law more precisely and effectively. For example, Surah Al-Isra's Verse 36 says:

> *"And do not follow what you have no knowledge of. Truly hearing, sight, and heart, all of that will be held accountable."*

This verse emphasizes the importance of knowledge and understanding in applying religious teachings, and knowledge of neuroscience can provide important additional insights into this process.

Sixth, Neuroscience can help humans better understand how to interact with the world and how this affects the understanding and practice of Islamic law. neuroscience has helped to better understand how the human brain processes information from the environment and how this influences thinking, feeling, and behavior.(van Dongen & Franken, 2019)

Neuroscience in Legal Responsibility: Implications and Challenges in Contemporary Islamic Law

Legal accountability has long been at the center of discussion in various legal traditions, including Islamic law. Determining individual capacity and accountability for their actions is often complex and multifaceted, involving a broad consideration of moral, social, and justice values. In the modern era, developments in neuroscience have opened new horizons for understanding human behavior and how the human brain works.(Alimardani & Chin, 2019) This new knowledge has the potential to provide a better explanation of various aspects of human behavior that could have significant implications for how legal responsibility is understood and applied, such as the example of accountability in criminal law.(Wang et al., 2022)

Applying neuroscience to criminal responsibility in Islamic Law can have several important implications. First, neuroscience can provide insight into the neurobiological factors that influence a person's criminal behavior.(Llamas & Marinaro, 2020) By understanding how the brain works, we can see how mental health disorders, trauma, or addiction can affect a person's ability to control their criminal behavior. This can assist in assessing the degree of individual responsibility and determining a more equitable approach to dealing with perpetrators of crimes.(Ligthart, 2019) For example, Surah An-Nisa's verse 29 states:

"O you who believe, do not eat each other's wealth in a vanity way, except by way of commerce that applies with mutual consent between you. And do not kill yourselves, verily Allah is Most Merciful to you."

This verse shows the importance of considering a person's mental state and health when evaluating their actions. In neuroscience, understanding mental health conditions and how they influence behavior can provide deeper insight into understanding and assessing individual criminal responsibility.(Jun & Yoo, 2018) While neuroscience can provide benefits in understanding criminal responsibility in Islamic law, some challenges must be overcome. First, there are ethical challenges related to privacy and the use of neuroscience technologies. Neuroimaging technology to evaluate individual brains can raise fairness and privacy concerns. Therefore, there is a need for a clear legal framework and strong ethics in the use of neuroscience in criminal liability. In addition, there are also challenges in determining the limits and criteria for using neuroscience in assessing criminal responsibility. There needs to be a careful approach to ensure that judgments become more flexible and pay attention to the relevant social and religious context in Islamic law.(Alimardani, 2018) In this context Examples of Relevant Quranic and Hadith Verses:

In the Al-Quran, Surah An-Nisa' verse 135 states:

"O you who believe, be true upholders of justice, bear witness for Allah, even against yourselves or your parents and relatives. If he is rich or poor, then Allah knows better his benefit. So do not follow your passions because you want to deviate from the truth. And if you twist (the words) or refuse to be a witness, then surely Allah is All-Knowing of all that you do."

This verse emphasizes the importance of justice in carrying out the law. In criminal liability, an understanding of neuroscience can help ensure that the assessment and application of punishment are based on fair and balanced justice principles. The Prophet Muhammad SAW's Hadith also provides relevant guidance regarding criminal liability. For example, the Prophet Muhammad SAW said: "There is no retribution for sins and crimes, except according to the deeds that have been done." This hadith emphasizes the principle that a person must be held responsible for his criminal actions by the actions that have been committed, taking into account relevant factors, including the understanding of neuroscience about individual capabilities.

Conclusion

Neuroscience provides significant insights into human brain function that can enhance the understanding and application of Islamic law in a variety of ways. By

studying how the brain processes decisions and moral values, we can better understand concepts like intention in Islamic law, improve educational methods, and develop more empathetic responses to mental health issues within the legal framework. The challenge of integrating neuroscience into Islamic law involves balancing scientific findings with religious values and ethics. This integration could lead to a more informed, evidence-based approach to Islamic law, making it more relevant to addressing contemporary issues and enhancing the practice of justice. Additionally, applying neuroscience to areas like criminal responsibility could help clarify the neurobiological factors that influence behavior, aiding in fairer assessments of individual accountability. However, this approach must be carefully managed to respect the principles of justice and the ethical boundaries of Islamic law. Overall, merging neuroscience with Islamic law could provide deeper insights into human behavior and a more profound application of religious teachings in modern society.

References

Aharoni, E., Vincent, G. M., Harenski, C. L., Calhoun, V. D., Sinnott-Armstrong, W., Gazzaniga, M. S., & Kiehl, K. A. (2013). Neuroprediction: Brain Scans Foretell Criminal Behavior. *Proceedings of the National Academy of Sciences of the United States of America*, *110*(15), 146–160. https://doi.org/10.1073/PNAS.1219302110

Alimardani, A. (2018). Neuroscience, Criminal Responsibility and Sentencing in An Islamic Country: Iran. *Journal of Law and the Biosciences*, *5*(3), 724–742. https://doi.org/10.1093/jlb/lsy024

Alimardani, A., & Chin, J. (2019). Neurolaw in Australia: The Use of Neuroscience in Australian Criminal Proceedings. *Neuroethics*, *12*(3), 255–270. https://doi.org/10.1007/s12152-018-09395-z

Amelia, R., Sartono, K. E., & Pasani, C. F. (2020). Kajian Neuroscience dalam Pengembangan Ilmu Sekolah Dasar. *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, *4*(1), 1–15. https://doi.org/10.24036/jippsd.v4i1.110447

Anderson, N. E., & Kiehl, K. A. (2020). Re-wiring Guilt: How Advancing Neuroscience Encourages Strategic Interventions Over Retributive Justice. *Frontiers in Psychology*, *11*(March), 1–12. https://doi.org/10.3389/fpsyg.2020.00390

Apriani Zarona Harahap, W., Syarifuddin, A., & Hermawan, B. (2021). Pengaruh Perubahan Sosial dalam Perkembangan Hukum di Indonesia. *Jurnal Hukum Fakultas Hukum Universitas Balikpapan*, *Vol 3,No 1*(1), 549–565. https://jurnal.law.uniba-bpn.ac.id/index.php/lexsuprema/article/view/462/pdf

Borbón, D. (2022). Neurosociology and Penal Neuroabolitionism: Rethinking Justice With Neuroscience. *Frontiers in Sociology*, *7*(January), 1–5. https://doi.org/10.3389/fsoc.2022.814338

Bratton, M. (2018). Shari'a Law and Modern Muslim Ethics. *Journal of Contemporary Religion*, *33*(2), 358–360. https://doi.org/10.1080/13537903.2018.1473212

Bush, S. S., & Tussey, C. M. (2013). Neuroscience and Neurolaw. *Psychological Injury and Law*, *6*(1), 1–2. https://doi.org/10.1007/s12207-013-9144-0

Chandler, J. A., Harrel, N., & Potkonjak, T. (2019). Neurolaw Today – A Systematic Review of The Recent Law and Neuroscience Literature. *International Journal of Law and Psychiatry*, *65*, 1–12. https://doi.org/10.1016/j.ijlp.2018.04.002

David E. J. Linden et al. (2021). *Neurolaw: Advances in Neuroscience, Justice & Security* (G. M. Sjors Ligthart, Dave van Toor, Tijs Kooijmans, Thomas Douglas (ed.); pp. 3–4). Palgrave Macmillan Cham.

Fernando, Z. J., Kristanto, K., Anditya, A. W., Hartati, S. Y., & Baskara, A. (2023). Robot Lawyer in Indonesian Criminal Justice System: Problems and Challenges for Future Law Enforcement. *Lex Scientia Law Review*, *7*(2), 1–24. https://doi.org/10.15294/LESREV.V7I2.69423

Fernando, Z. J., Rosmanila, Ratna, L., Cholidin, A., & Nunna, B. P. (2023). The Role of Neuroprediction and Artificial Intelligence in the Future of Criminal Procedure Support Science: A New Era in Neuroscience and Criminal Justice. *Yuridika*, *38*(3), 593–620. https://doi.org/10.20473/YDK.V38I3.46104

Fletcher, M. (2006). How Can We Understand Islamic Law Today? *Islam and Christian–Muslim Relations*, *17*(2), 159–172. https://doi.org/10.1080/09596410600604427

Gynther, B. D., Calford, M. B., & Sah, P. (1998). Neuroplasticity and Psychiatry. *Australian and New Zealand Journal of Psychiatry*, *32*(1), 119–128. https://doi.org/10.3109/00048679809062718

Hatta, M., Zulfan, & Srimulyani. (2019). Autopsi Ditinjau dari Perspekif Hukum Positif Indonesia dan Hukum Islam. *Ijtihad: Jurnal Wacana Hukum Islam Dan Kemanusiaan*, *19*(1), 27–51. https://doi.org/10.18326/ijtihad.v19i1.27-51

Ienca, M. (2021). On Neurorights. *Frontiers in Human Neuroscience*, *15*(September), 1–11. https://doi.org/10.3389/fnhum.2021.701258

Jones, M. (1992). Islamic Law in Saudi Arabia: A Responsive View. *International Journal of Comparative and Applied Criminal Justice*, *16*(1–2), 43–56. https://doi.org/10.1080/01924036.1992.9688979

Jun, J., & Yoo, S. (2018). Three Research Strategies of Neuroscience and the Future of Legal Imaging Evidence. *Frontiers in Neuroscience*, *12*(MAR), 1–9. https://doi.org/10.3389/fnins.2018.00120

Laszlo, E. (1997). A Note on Evolution. *World Futures*, *49*(3–4), 205–211. https://doi.org/10.1080/02604027.1997.9972631

Ligthart, S. L. T. J. (2019). Coercive Neuroimaging, Criminal Law, and Privacy: A European Perspective. *Journal of Law and the Biosciences*, *6*(1), 296–316. https://doi.org/10.1093/jlb/lsz015

Llamas, N. E., & Marinaro, J. Á. (2020). Neuroscience in Youth Criminal Law: Reconsidering the Measure of Punishment in Latin America. *Frontiers in Psychology*, *11*(February), 11–14. https://doi.org/10.3389/fpsyg.2020.00302

McCay, A., & Kennett, J. (2021). Neuroscience and Punishment: From Theory to Practice. *Neuroethics*, *14*(3), 1–14. https://doi.org/10.1007/S12152-018-09394-0/METRICS

McWilliams, A., Fleming, S. M., David, A. S., & Owen, G. (2020). The Use of Neuroscience and Psychological Measurement in England's Court of Protection. *Frontiers in Psychiatry*, *11*(December), 1–14. https://doi.org/10.3389/fpsyt.2020.570709

Meynen, G. (2019). Forensic Psychiatry and Neurolaw: Description, Developments, and Debates. *International Journal of Law and Psychiatry*, *65*, 1–6. https://doi.org/10.1016/j.ijlp.2018.04.005

Morse, S. (2015). Neuroprediction: New Technology, Old Problems. *SSRN Electronic Journal*, *8*, 128. https://doi.org/10.2139/SSRN.2722765

Pernu, T. K., & Elzein, N. (2020). From Neuroscience to Law: Bridging the Gap. *Frontiers in Psychology*, *11*, 1–23. https://doi.org/10.3389/FPSYG.2020.01862/BIBTEX

Rivalina, R. (2020). Neuroscience Approaches Improving High Order Thinking Skills of Basic Education Teacher. *Kwangsan, Jurnal Teknologi Pendidikan*, *Rivalina*,(01), 83–109. http://doi.org/10.31800/jtp.kw.v8n1.p83--109%0APENDEKATAN

Schacht, J. (1965). Modernism and Traditionalism in a History of Islamic Law. *Middle Eastern Studies*, *1*(4), 388–400. https://doi.org/10.1080/00263206508700026

Sirman Dahwal et al. (2020). Penal Mediation as A Medical Dispute Settlement For Hospital Malpractice Cases in Indonesia. *Jurnal Ilmiah Kebijakan Hukum*, *14*(1), 539–556. https://doi.org/http://dx.doi.org/10.30641/kebijakan.2022.V16.539-556

Tigano, V., Cascini, G. L., Sanchez-Castañeda, C., Péran, P., & Sabatini, U. (2019). Neuroimaging and Neurolaw: Drawing the Future of Aging.

Frontiers in Endocrinology, *10*(APR), 1–15. https://doi.org/10.3389/fendo.2019.00217

van Dongen, J. D. M., & Franken, I. H. A. (2019). Neuroscience in Forensic Psychiatry and Psychology: An Introduction to the Special Issue. *International Journal of Forensic Mental Health*, *18*(3), 179–186. https://doi.org/10.1080/14999013.2019.1652708

Wang, W., Chen, Z., & Ding, X. (2022). Cyberbullying Victimization and Disordered Eating Behaviors: The Mediating Roles of Self-Compassion and Self-Objectification. *Appetite*, *178*, 1–2. https://doi.org/10.1016/J.APPET.2022.106267