




Neuroscience, criminal responsibility and sentencing in an islamic country: Iran

Armin Alimardani *

School of Law, University of New South Wales, Sydney, NSW 2052, Australia
Corresponding author. E-mail: a.alimardani@unsw.edu.au

ABSTRACT

The implications of neuroscience in the legal context have been considered in many countries; however, there has been very little (if any) research on the use of neuroscience in criminal law in Iran. Furthermore, because Iran's legal system incorporates Islamic rules, the legal implications of neuroscience might be fundamentally different from those of other countries. Accordingly, this paper will discuss the potential use of neuroscientific evidence in the evaluation of criminal responsibility and the assessment of sentencing within the Islamic legal system of Iran. The study will conclude that while there are a number of issues that may prevent the use of neuroscience in Iran's criminal justice system, there is a potential for the neuroscience to be used for purposes such as establishing the insanity defense and mitigating the punishment.

KEYWORDS: criminal law, criminal responsibility, Iran, neurolaw, neuroscience, sentencing

* Armin is a Ph.D. candidate in law at UNSW, Australia, and he is conducting an empirical study of the use of neuroscience in sentencing in Australian Criminal Courts. He commenced his Bachelor of Law in 2007 in Iran and completed his Master of Criminal Law and Criminology in 2014 in Iran. His thesis focused on the relationship between genetics and criminal law and published it as a book titled 'Genetics and Crime'. He was elected as the author of the distinguished Persian book of the year in students' section by Iranian Students Book Agency (ISBA). In 2016, Armin joined the Australian Neurolaw Database Project (neurolaw.edu.au) on analysing cases in the Australian courts that involve neuroscience. Although Armin's main focus is on biological sciences and law, he is also passionate about the intersection of other areas with law, such as mathematics and computer sciences.

INTRODUCTION

Neuroscience is a relatively new area of scientific inquiry in the legal context, and it contributes to the way that criminal justice systems (CJS) view criminality. Some researchers have claimed that neuroscientific examination techniques can detect abnormalities of the brain that might influence criminal behavior.¹ These techniques come in various forms, one of which is the brain scan (or ‘neuroimaging’). Generally, neuroimaging tools such as computed tomography and magnetic resonance imaging (MRI) scans can show the structure of the brain, while neuroimaging tools such as functional MRI (fMRI) can indicate the function of different areas of the brain.² For instance, an fMRI may show which areas of the brain are more active when the subject conducts a specific task. By using these tools, neuroscientists have shown how the structure and function of different areas of the brain are associated with cognitive processes and executive functions.³ For example, abnormalities in the prefrontal cortex, which is involved in planning and decision-making, may result in impulsive and antisocial behavior.⁴ From a criminal law perspective, these abnormalities of the brain may result in reduced or limited ability to control or understand criminal behavior and may consequently affect criminal responsibility and sentencing.⁵ Accordingly, neuroscientific tools can be used as evidence in courts to indicate the existence of brain abnormality for different purposes, such as establishing the insanity defense or mitigating the sentence due to reduced capacity to control behavior.

The growing scholarly interest in the intersection of neuroscience and law⁶ resulted in the evaluation of the *potential* use of neuroscientific evidence in various CJS,⁷ a few studies also adopted an empirical methodology and examined how this evidence has

¹ See Martin Aigner et al., *Brain Abnormalities and Violent Behavior*, 11 J. PSYCHOL. HUMAN SEX. 57 (2000); Rebecca Umbach, Colleen M. Berryessa & Adrian Raine, *Brain Imaging Research on Psychopathy: Implications for Punishment, Prediction, and Treatment in Youth and Adults*, 43 J. CRIM. JUSTICE 295 (2015); ADRIAN RAINE, *THE ANATOMY OF VIOLENCE: THE BIOLOGICAL ROOTS OF CRIME* (2013); Julian C. Motzkin et al., *Reduced Prefrontal Connectivity in Psychopathy*, 31 J. NEUROSCI. 17348 (2011); Kent A. Kiehl et al., *Temporal Lobe Abnormalities in Semantic Processing by Criminal Psychopaths as Revealed by Functional Magnetic Resonance Imaging*, 130 PSYCHIATRY RES. NEUROIMAGING 27 (2004); María A. Bobes et al., *Linkage of Functional and Structural Anomalies in the Left Amygdala of Reactive-Aggressive Men*, 8 SOC. COGN. AFFECT. NEUROSCI. 928 (2013); Kolja Schiltz et al., *High Prevalence of Brain Pathology in Violent Prisoners: A Qualitative CT and MRI Scan Study*, 263 EUR. ARCH. PSYCHIATRY CLIN. NEUROSCI. 607 (2013); Sarah M. Bannon, Katie Lee Salis & K. Daniel O’Leary, *Structural Brain Abnormalities in Aggression and Violent Behavior*, 25 AGGRESS. VIOLENT BEHAV. 323 (2015).

² Semir Zeki & Oliver Goodenough, *Law and the Brain: Introduction*, 359 PHILOS. TRANS. R. SOC. B BIOL. SCI. 1661 (2004); Oliver R Goodenough & Micaela Tucker, *Neuroscience Basics for Lawyers*, 62 MERCER L. REV. 945 (2011).

³ Laura Klaming & B. J. Koops, *Neuroscientific Evidence and Criminal Responsibility in the Netherlands*, in *INTERNATIONAL NEUROLAW: A COMPARATIVE ANALYSIS* (Tade Matthias Spranger ed., 2012).

⁴ See RAINE, *supra* note 1, at 65–67; Montgomery C. Brower & B. H. Price, *Neuropsychiatry of Frontal Lobe Dysfunction in Violent and Criminal Behaviour: A Critical Review*, 71 J. NEUROL. NEUROSURG. PSYCHIATRY 720 (2001).

⁵ See Nita A. Farahany, *Neuroscience and Behavioral Genetics in US Criminal Law: An Empirical Analysis*, 2 J. L. BIOSCI. 485 (2016); C. H. de Kogel & E. J. M. C. Westgeest, *Neuroscientific and Behavioral Genetic Information in Criminal Cases in the Netherlands*, 2 J. L. BIOSCI. 580 (2015).

⁶ Francis X. Shen, *The Law and Neuroscience Bibliography: Navigating the Emerging Field of Neurolaw*, 38 INT. J. LEGAL INFO. 352 (2010).

⁷ See *INTERNATIONAL NEUROLAW: A COMPARATIVE ANALYSIS* (Tade Matthias Spranger ed., 2012).

been used in criminal courts in *practice*.⁸ However, in Iran, there is relatively little interest in the biological explanation of criminal behavior and its relationship with criminal law. The criminological studies mainly focus on psychological factors such as mental disorders and social factors such as peer groups, the economy, poverty, unemployment, education, addiction, cultural conflict, parenting, and family factors.⁹ Only a few studies have examined the potential use of genetics as a factor in criminal behavior in the CJS,¹⁰ and it seems that no study has evaluated the use of neuroscientific evidence in Iran's criminal courts. As such, the overall aim of this study is to fill this gap and to discuss whether, and to what extent, Iran's CJS permits the use of neuroscientific evidence in the evaluation of criminal responsibility and the assessment of sentencing.

This paper does not aim to examine how neuroscientific evidence has been used in practice; instead, the discussions will center on the potential use of neuroscientific evidence within the existing legal framework. The main reason for this methodology is the limited accessibility of criminal case transcripts. In Iran, cases are not uploaded to any database (or converted to an electronic format). Consequently, finding a sufficient number of criminal cases that refer to neuroscientific evidence in order to draw conclusions about how neuroscience has been used in practice is not feasible. The discussions in this study are occasionally simplified (for example, omissions are made in relation to exceptional circumstances of cases and legal rules that are rarely applied), as Iran's CJS is complex and there is insufficient space here to discuss all aspects of, and perspectives on, the use of neuroscientific evidence in courts.¹¹ However, these simplifications have no impact on the general conclusions of this study.

As Iran's CJS is fundamentally different from many other countries, this paper first gives a brief overview of the Iranian CJS. Following this overview, the paper examines how neuroscience may be relevant to criminal responsibility and sentencing within Iran's criminal law. It then explores the applicability of neuroscientific evidence,¹² first

⁸ See Jennifer A. Chandler, *The Use of Neuroscientific Evidence in Canadian Criminal Proceedings*, 2 J. L. BIOSCI. 550 (2016); Paul Catley & Lisa Claydon, *The Use of Neuroscientific Evidence in the Courtroom by those Accused of Criminal Offenses in England and Wales*, 2 J. L. BIOSCI. 510 (2015); de Kogel & Westgeest, *supra* note 5; Farahany, *supra* note 5; Deborah W. Denno, *The Myth of the Double-Edged Sword: An Empirical Study of Neuroscience Evidence in Criminal Cases*, 56 B.C. L. REV. 493 (2015).

⁹ For some examples of studies in Iran that discuss underlying social and psychological factors of criminal behavior, see Abdulrahim Asadullahi & Mohammed Baratvand, *Effects of Child Abuse on Criminal Behavior*, 5 SOC. WELFARE. 225 (2006); Mohammad Mehdi Ghasemi Kia & Abdol-Mohammad Kurdi, *External Factors and Offending*, 1 POLIT. SCI. LAW JURISPRUD. 11 (2016); Fakhr al-Din Taghadosi Nezhad et al., *Schizophrenia and Antisocial Personality Disorder and Criminality*, 28 FORENSIC SCI. IRAN 5 (2003); Hadi Abdollah Tabar, *Investigating the Role of Economic and Cultural Poverty in the Proliferation of Murder in Society*, 2 MANAG. STUD. ENTREP. 247 (2017); Mohsen Noghani Dokht Bahmani & Seyed Ahmad Mir Mohammadtabar, *The Influence of Economic Factors on Crime*, 4 SECUR. SOC. ORDER STRATEG. STUD. 85 (2016); Mansour Atasheneh & Mehdi Amiri, *The Causes of Theft in Ahvaz (Between 1996 and 2006)*, 4 J. SOC. SCI. 103 (2011).

¹⁰ See ARMIN ALIMARDANI, ALI M ARDEKANI & MOSTAFA VAHEDI, *GENETICS AND CRIME* (2015); AMIR BASTANI, SEYED MOHAMMAD AKRAMI & VAHIDEH KARIMIRAD, *THE BIOLOGICAL AND GENETIC FACTORS ON CRIMINAL BEHAVIOUR* (2011).

¹¹ For instance, in the following section, I will note that there is no jury in Iran's CJS. However, the jury does exist but only in very specific types of crime, such as political crimes and press offenses (see Principle 168, Constitutional Law and Article 305, Criminal Code of Procedure). Further, the jury's system in Iran is very different from other countries. For instance, according to article 43 of Iran's *Press Code* (2000), if the jury finds the accused guilty or not guilty, the court can rule otherwise.

¹² That is, whether evidence only of *mental* and *psychological* conditions is applicable to Iran's CJS, or if evidence of brain impairment may also be also applicable.

to Iran's Islamic Penal Code (2013) and then to key sources of Islamic legal norms, with reference to an empirical study. Finally, the process of raising neuroscientific evidence in criminal procedure, including the admissibility of this evidence and at which stages this evidence might be raised, is discussed.

CRIMINAL LAW IN IRAN

In 1979, an Islamic revolution in Iran ended the 2500 years of Persian monarchy. Following the revolution, Iran's legal system that was adopted from the European legal code was heavily influenced by Islamic rules and an Islamic constitution was formed.¹³ According to Principle Four of Iran's Constitution, '[a]ll legal rules including civic, penal, financial, economic, administrative, cultural, political and so on, must comply with Islamic rules [Shari'a]. This principle applies to all the principles of constitution, and other laws and regulations...'. Shari'a is derived from Islamic sources such as Quran (Koran).¹⁴ Therefore, judges' sources of decision-making are derived from, or acknowledge, Islamic rules.

There are two main legal sources for judges that are related to this study, and I will briefly explain both. The first source is Iranian *legal codes*, which are issued by the Parliament (Majles).¹⁵ All legislation made by the Parliament must be approved by the Council of Guardians, a body which consists of 12 members and decides if the legislation passed by the Parliament complies with the Constitution and Shari'a. If it does not, the Council of Guardians will ask the Parliament to modify the legislation.¹⁶

The second source is *fatwa*, and it applies when a matter has not been determined by legal codes. In order to understand and apply Islamic sources of law (Shari'a) following the death of the prophet Mohammad, Islamic jurists—through the use of Fiqh (Islamic jurisprudence)—have been understanding and interpreting the divine sources of Shari'a and transforming them into Islamic legal rules to answer enquiries regarding contemporary issues and to regulate people's lives.¹⁷ Interpretation of Islamic sources requires Islamic jurists to be Marja'-e-Taqlaed (in English, a 'source of emulation'), meaning a person with a high level of knowledge of Islamic rules.¹⁸ There are several Marja'-e-Taqlaed in Iran and their opinions are occasionally different from each other.

¹³ VANESSA MARTIN, CREATING AN ISLAMIC STATE: KHOMEINI AND THE MAKING OF A NEW IRAN (2003). For more information about the history of the legal system in Iran, see Nader Entessar, *Criminal Law and the Legal System in Revolutionary Iran*, 8 B.C. THIRD WORLD L.J. 91 (1988).

¹⁴ Other Islamic sources are the Prophet's tradition (ie legal matters that Prophet Muhammad noted), the Consensus of jurists (ie where a decision about a legal matter cannot be determined with reference to the Quran and the Prophet's tradition, it should be approved by a majority decision of Islamic legal scholars), and Islamic legal reasoning (ie where all of the other sources have not discussed a legal matter, judges may use legal reasoning such as analogy). For instance, alcohol is prohibited by Islam. If scientists produce a new liquid that has a similar influence to alcohol, it may be prohibited by analogy to alcohol). See Entessar, *supra* note 13, at 94–95; HOSSEIN MODARRESSI-TABATABA'I, AN INTRODUCTION TO SHI 'I LAW: A BIBLIOGRAPHICAL STUDY (1984).

¹⁵ Parliament members are elected by the people's vote.

¹⁶ Ziba Mir-Hosseini, *Sharia and National Law in Iran*, in SHARIA INCORPORATED: A COMPARATIVE OVERVIEW OF THE LEGAL SYSTEMS OF TWELVE MUSLIM COUNTRIES IN PAST AND PRESENT 319 (Otto Jan Michiel ed., 2010).

¹⁷ PARVIN PAIDAR, WOMEN AND THE POLITICAL PROCESS IN TWENTIETH-CENTURY IRAN (1997).

¹⁸ MOHAMMAD HASHIM KAMALI, SHARI'AH LAW: AN INTRODUCTION (2008); also see Asifa Quraishi, *Interpreting the Qur'an and the Constitution: Similarities in the Use of Text, Tradition, and Reason in Islamic and American Jurisprudence*, 28 CARDOZO L. REV. 67 (2006).

Different groups of people may choose different Marja'-e-Taqleed and follow their particular interpretation of Islamic rules in their everyday lives. The legal opinion of Marja'-e-Taqleed is called *fatwa* and is a binding rule for their followers.¹⁹ If a judge cannot find a specific legal matter in legal codes (issued by the Majles), he or she can use *fatwa* (Marja'-e-Taqleed legal opinion) to resolve the legal issue.²⁰

However, as noted above, there are different Marja'-e-Taqleed who may have different opinions regarding a similar inquiry. This can result in different decisions by judges who follow different Marja'-e-Taqleed. That said, legal issues are usually addressed in codes and only some specific matters (ie scientific and recent issues) are not. For instance, sex change surgery has relatively recently been made possible and accessible by modern medical sciences. In Iran, sex changes are not codified by Parliament, which means Marja'-e-Taqleed have interpreted Islamic rules and issued *fatavai* (pl. *fatva*) in this regard. Some Marja'-e-Taqleed have permitted sex change surgery; however, there are other Marja'-e-Taqleed that have not allowed it.²¹ As a consequence, some courts allow this surgery and others do not based on which Marja'-e-Taqleed the judge follows.²²

With regard to criminal procedure, Iran's criminal system is *inquisitorial*. This means that the judges, along with the parties, play an active role in investigating and fact-finding. The investigation of crime is conducted by the interrogator (also known as the inquisitor or the examining magistrate) under the supervision of the prosecutor.²³ During the investigation, the interrogator should be impartial to the defendant and should provide all the available evidence.²⁴ Similarly, the prosecutor, who represents the interest of the society,²⁵ should remain neutral and strive to uncover all the facts—even if they support the defendant.²⁶ In Iran's criminal courts, there are no juries,²⁷ so decisions in both the guilt and sentencing phases are made by the trial judge.²⁸ For more serious crimes, these decisions are made by three judges.²⁹

NEUROSCIENCE, CRIMINAL RESPONSIBILITY, AND SENTENCING IN IRAN'S CJS

In this section, I will discuss whether, and in which areas, neuroscience may be relevant to assessment of criminal responsibility and sentencing. In jurisdictions which have examined the role of neuroscience in criminal courts, it has been suggested that neuroscience may affect criminal responsibility and sentencing in three

¹⁹ Zara Saeidzadeh, *Transsexuality in Contemporary Iran: Legal and Social Misrecognition*, 24 FEM. LEG. STUD. 249 (2016); for more information about Marja'-e-Taqleed, see MOOJAN MOMEN, *AN INTRODUCTION TO SHI'Ī ISLAM: THE HISTORY AND DOCTRINES OF TWELVER SHI'ISM* (1985).

²⁰ Principle 167, Constitutional Law of Iran, 1979.

²¹ Mostafa Vahedi et al., *Gender Dysphoria in Iran: Legal and Islamic Jurisprudence Perspectives*, 1 BIOETHICS HEALTH L. J. 41 (2017).

²² Saeidzadeh, *supra* note 19, at 259; Vahedi et al., *supra* note 21, at 94–95.

²³ Article 73, 76, 89, 92, Criminal Code of Procedure for Public and Revolutionary Courts (2013) [hereinafter Criminal Code of Procedure].

²⁴ Article 93, Criminal Code of Procedure.

²⁵ Article 22, Criminal Code of Procedure.

²⁶ Article 3, Criminal Code of Procedure.

²⁷ See *supra* note 11.

²⁸ It can be said that the guilt and sentencing phases are combined into one phase.

²⁹ Article 296, Criminal Code of Procedure.

circumstances.³⁰ First, neuroscientific evidence can help establish the ‘insanity defense’,³¹ which can entitle the accused to an acquittal. Second, neuroscience can contribute to the defense of ‘diminished responsibility’, which reduces the punishment for murder to that of manslaughter.³² Third, neuroscientific evidence can also play a role in mitigating and aggravating sentencing factors.

In Iran’s legal codes, there is no reference to the brain or, more generally, to biological factors (ie genetics) and only matters regarding the accused’s *mental* and *psychological* conditions are outlined and as this study is not based on empirical research, it is not possible to indicate whether courts recognize neuroscience as being relevant to criminal responsibility and sentencing. As such, in the following section, I will initially *assume* that Iran’s CJS acknowledges the relationship between the brain and mental conditions in order to explore circumstances in which neuroscience is potentially relevant to criminal responsibility and sentencing. This assumption is plausible because in some (though admittedly not many) studies by Iranian scholars, the relationship between biological factors, mental conditions, and crime is recognized.³³ Furthermore, many studies throughout the history of neuroscience have supported the connection between the brain and mental functions (eg anxiety and decision making).³⁴ Accordingly, a defense lawyer may argue for the defendant’s mental condition via neuroscience: eg the defendant’s brain injury has resulted in impaired judgement, disorganized thinking, and an inability to control their behavior.³⁵

In the following section, by focusing on the three potentially relevant areas outlined above, and based on the previous discussion, I will return to this assumption and provide a more detailed discussion of the applicability of neuroscience within Iranian legislation and according to Islamic sources.

According to Iran’s Penal Code, an individual is responsible for committing crime if, at the time of the incident, he/she is sane, pubescent,³⁶ and has free will.³⁷ Exceptions may be made where some special circumstances (such as being under duress,³⁸ being

³⁰ See Farahany, *supra* note 5; Catley & Claydon, *supra* note 8; de Kogel & Westgeest, *supra* note 5.

³¹ Also known as the ‘defense of mental illness’.

³² Also known as ‘substantial impairment by abnormality of mind’.

³³ See Seyed Mohamad Hoseini & Masoud Mostafapoor, “Neurocriminology”, *A New Approach To The Analysis Of Juvenile Violent Crime (With Emphasis On Age-Crime Curve)*, 5 J. CRIM. LAW RES. 165 (2017). Arian Petoft, *Neurolaw: A Brief Introduction*, 14 IRAN. J. NEUROL. 53 (2015). Arian Petoft et al., *Controversial Brain Imaging as a Terrorism Emergency Measure in Neurolaw Discourse*, 2 NEUROL. NEUROTHER. 000118 (2017). BASTANI ET AL., *supra* note 10. ALIMARDANI ET AL., *supra* note 10. Ali Ardekani, *Genetic, Behavior and Culture*, 3 MED. ETHICS J. 65–83 (2009).

³⁴ See NIKOLAS ROSE & JOELLE M. ABI-RACHED, *NEURO: THE NEW BRAIN SCIENCES AND THE MANAGEMENT OF THE MIND* (2013). For the relationship between schizophrenia and the brain, see also Neeltje E. M. van Haren et al., *Schizophrenia as a Progressive Brain Disease*, 23 EUR. PSYCHIATRY 245 (2008); Lynn E. DeLisi et al., *Understanding Structural Brain Changes in Schizophrenia*, 8 DIALOGUES CLIN. NEUROSCI. 71 (2006).

³⁵ In other words, the defense may attempt to connect (or translate) what the court may not find applicable (brain issues), to what the criminal law finds applicable (mental issues).

³⁶ Age of puberty is about 9 years for girls and about 15 years for males. Article 147, Islamic Penal Code of the Islamic Republic of Iran (2013) [hereinafter Islamic Penal Code].

³⁷ Article 140, Islamic Penal Code.

³⁸ Article 151, Islamic Penal Code.

a minor,³⁹ or being legally insane)⁴⁰ are established.⁴¹ The sentence may also be mitigated if the offender's mental condition is impaired at the time of the offense⁴² (I will return to this point later). The applicability of these special circumstances varies based on the type of crime. The *Islamic Penal Code of the Islamic Republic of Iran* (2013) divides crimes into four categories based on the type of punishment for each category of offense. The four types are *Hadd*, *Qisas*, *Diyyeh*, and *Ta'zir*.⁴³ While in all types of crimes an individual who has *no criminal responsibility* (ie where the insanity defense has been established) receives *no punishment*, for *Hadd*, *Qisas*, and *Diyyeh* punishment is fixed and cannot be *mitigated* or *aggravated*, and consequently mental (or brain) conditions evidence cannot influence the sentence. The four categories of crime are explained below:

*Hadd*⁴⁴ (mandatory punishments) are acts prohibited by God and punished with *mandatory* and harsh punishments derived from Quran.⁴⁵ These punishments rarely apply in practice as a high standard of proof is demanded.⁴⁶ *Hadd* is a fixed punishment and cannot be mitigated or aggravated.⁴⁷ An example of a *Hadd* crime is 'adultery' (*Zina*), which is the act of intercourse between a man and a woman who are not married to each other, unless the act is committed unwittingly. Punishment for this offense is 100 lashes.⁴⁸ In some circumstances, the punishment for this crime is execution. For instance, where *Zina* is committed by force (similar to rape).⁴⁹ *Zina* can only be proved by four male witnesses who have directly observed the offense.⁵⁰

Qisas (retaliation) is a *primary* punishment for *intentional* bodily crimes against life, limb, and abilities.⁵¹ Similar to 'lex talionis' (also known as 'an eye for an eye'), an offender should be punished (injured) exactly equally to the injury he/she imposed upon the victim.⁵² Accordingly, in the case of murder, the punishment is execution. *Qisas* is a fixed punishment and cannot be mitigated or aggravated.

Diyyeh (blood money) is compensation for the death or injury and is a *secondary* punishment that replaces *Qisas* punishment in two situations: (i) where the criminal act is *intentional* but the victim, or his/her family (in case of murder), request *Diyyeh* instead of *Qisas* as a form of compensation;⁵³ (ii) where the criminal act is

³⁹ Article 146, Islamic Penal Code.

⁴⁰ Article 149, Islamic Penal Code.

⁴¹ There are exceptional circumstances that may have different consequences. For instance, duress in murder does not eliminate criminal responsibility. The individual under duress would be executed and the person who used duress to cause the murder would receive life imprisonment. Article 375, Islamic Penal Code.

⁴² Articles 18 and 36, Islamic Penal Code.

⁴³ Article 14, Islamic Penal Code; Entessar, *supra* note 13, at 96–98.

⁴⁴ *Hodud* is the plural of *Hadd*.

⁴⁵ Entessar, *supra* note 13, at 97; Mir-Hosseini, *supra* note 16, at 358. Article 15, Islamic Penal Code.

⁴⁶ See Article 199, Islamic Penal Code. To read more about the high standard of proof for *Hadd* crimes, see Gamil Muhammed Hussein, *Basic Guarantees In Islamic Criminal Justice System*, in *CRIMINAL JUSTICE IN ISLAM: JUDICIAL PROCEDURE IN THE SHARI'AH* (Muhammad Abdel Haleem, Adel Omar Sherif & Kate Daniels eds., 2003); MASHOOD A BADERIN, *INTERNATIONAL HUMAN RIGHTS AND ISLAMIC LAW* (2003).

⁴⁷ Article 219, Islamic Penal Code.

⁴⁸ Article 229, Islamic Penal Code.

⁴⁹ Article 224, Islamic Penal Code.

⁵⁰ Article 199, Islamic Penal Code.

⁵¹ Article 16, Islamic Penal Code.

⁵² Jeremy Waldron, *Lex Talionis*, 34 ARIZ. L. REV. 25, 25 (1992).

⁵³ Article 17, Islamic Penal Code.

unintentional, only Diyyeh applies.⁵⁴ Diyyeh is a fixed sum and, for each type of bodily harm, the law has determined a certain amount of compensation.

Ta'zir (discretionary punishment) applies when the crime is not in the category of Hadd, Qisas, and Diyyeh.⁵⁵ *Ta'zir* forms the majority of punishments in Iran's criminal code.⁵⁶ The judge considers the public interest and the particular context of the case, using his/her *discretion* to determine an appropriate punishment.⁵⁷ The judge will then decide if mitigating and aggravating factors exist and reduce or increase the punishment accordingly. However, a judge's discretion is limited to a range of punishment options within the range of minimum and maximum sentences, which are defined and codified in the Islamic Penal Code for each *Ta'zir* crime.⁵⁸

In summary, Qisas, Hadd, and Diyyeh involve mandatory punishments. Criminal responsibility and sentencing in Iran's criminal law in the case of Qisas, Hadd, and Diyyeh are binary and only two options are available: that the person has no criminal responsibility and receives no sentence (ie the insanity defense), or that the individual is fully responsible and receives complete punishment. A finding of anything between these two ends of the spectrum will result in the person being held fully responsible, and mitigating or aggravating factors will have no influence on the sentence. This is different to *Ta'zir*, where mitigating and aggravating factors can influence the sentence and the individual can be held *partially* responsible. There is an exceptional situation in Qisas punishment that might make neuroscientific evidence applicable in sentencing. When the Qisas punishment is not imposed (for instance, when the victim requests Diyyeh instead of Qisas), it is possible for the court to order *Ta'zir* punishment in addition to Diyyeh.⁵⁹ In these circumstances, the court may diminish the *Ta'zir* punishment (ie based on the individual's mental condition).

Given this explanation of the different types of crime in Iran's CJS, I will now explain the three circumstances in which neuroscience may be relevant: the insanity defense, the defense of diminished responsibility, and mitigating and aggravating sentencing factors.

Insanity defense

This defense is set out in Article 149 of Iran's Penal Code and can be applied if, at the time of the crime, the individual lacked the ability to control their actions or could not differentiate between good and bad due to a *mental disorder*. When the defense is raised, the defendant may argue that the accused is suffering from some brain abnormality (ie damage to the prefrontal cortex)⁶⁰ and he/she was not able to control their behavior when they committed the crime. If this abnormality is severe enough that the insanity defense is successful, the individual has no criminal responsibility.

While neuroscientific evidence can contribute to a successful insanity defense and therefore prevent the accused from being sentenced, the defense can also lead to

⁵⁴ An example of an unintentional crime is accidentally hitting a person while driving a car. In these situations, only Diyyeh applies.

⁵⁵ Article 18, Islamic Penal Code.

⁵⁶ Mir-Hosseini, *supra* note 16, at 359.

⁵⁷ Entessar, *supra* note 13, at 98.

⁵⁸ Article 13, Islamic Penal Code.

⁵⁹ Article 382, Islamic Penal Code; Entessar, *supra* note 13, at 98.

⁶⁰ As I described in the introduction, the prefrontal cortex is involved in planning and decision-making.

negative consequences. For example, if it is proved (through expert evidence) that the individual poses a danger to the community, *security measures*, such as detaining the individual in a psychotherapy facility,⁶¹ are imposed for an indeterminate period.⁶² The detention will continue until it is proved that the individual is treated and no longer poses a danger to society.⁶³

As such, neuroscientific evidence may have two opposing functions. On the one hand, neuroscientific evidence can result in a successful defense of insanity and result in the individual's acquittal. On the other hand, if it indicates abnormality of the brain that may put the community in danger (this includes problems such as impulsive behavior), the offender will not be set free. While security measures are not defined as punishment in Iran's Criminal Code,⁶⁴ they are still unpleasant, and remove the individual's liberty. Neuroscientific evidence has also been called a 'double-edged sword' for this reason⁶⁵ and it seems this double-edged sword may apply in an Iranian legal context.

Diminished responsibility (murder to manslaughter)

As murder falls into the category of *Qisas*, mental and psychological conditions cannot diminish the sentencing decision. That means the defense of diminished responsibility is not identified in Iran's Penal Code. Accordingly, even if an offender experiences a substantial mental disorder at the time of the offense (yet not severe enough to result in a successful insanity defense), they would still be executed.

Mitigating and aggravating factors in sentencing

As discussed before, *Qisas*, *Hadd*, and *Deyyeh* are fixed punishments and even if the ability to control acts or differentiate between right and wrong is significantly reduced (but not completely impaired), the offender will receive the full punishment. Therefore, the only type of punishment for which neuroscientific evidence can be used to formulate claims to mitigate or aggravate the sentence is *Ta'zir* (the discretionary punishment).

In Iran's Criminal Code, there is no aggravating factor related to mental conditions and subsequently brain impairment (as noted before, security measures are not considered punishment). However, there are a number of codes that can be used to reduce the sentence.

One application of neuroscientific evidence is where *Ta'zir* punishment has a negative influence on the illness of the offender, or where the illness adds to the custodial hardship.⁶⁶ Another use of neuroscience is related to the circumstances of the offense and where the impairment exists at the time of the crime. Two articles of the Iranian Criminal Code have elaborated on this matter:

⁶¹ Article 150, Note 2, Islamic Penal Code.

⁶² Article 150, Islamic Penal Code.

⁶³ Article 150, Islamic Penal Code.

⁶⁴ Article 14 and 150, Islamic Penal Code.

⁶⁵ Denno, *supra* note 8, at 493–94; Owen D. Jones & Francis X. Shen, *Law and Neuroscience in the United States*, in *INTERNATIONAL NEUROLAW: A COMPARATIVE ANALYSIS* (Tade Matthias Spranger ed., 2012).

⁶⁶ Articles 18(d) and 38 (e), Islamic Penal Code.

- The judge *can mitigate* the punishment based on the '[s]pecific circumstances that contributed to the commitment of crime ...';⁶⁷ as such, a judge based on their discretion *may* consider brain impairment as one of the specific circumstances that predispose the offender to commit the criminal behavior.
- '... In *determining* the Ta'zir [punishment], the court considers ... the offender's ... *mental and psychological conditions* at the time of committing the crime' (emphasis added).⁶⁸ Similarly, a judge based on their discretion could consider the influence of brain impairment on mental and psychological conditions of the offender at the time of crime.

While both sections might be seen as diminishing the sentence, the first section is concerned with mitigating the punishment, while the second section is focused on determining a proportionate punishment based on the circumstances of the offense. The outcome of this difference may be significant. In *determining* the sentence when mental and psychological conditions contribute to a decreased ability to control the behavior or differentiate between right and wrong, the Act *requires* the judge to consider the reduced criminal responsibility and proportionally determine the sentence on that basis. However, when it comes to *mitigating* factors, consideration of those elements is *not mandatory* for the judge. Also, mitigating factors can only modify the determined sentence within a specific range that is defined by the Code⁶⁹ and cannot proportionally change the sentence.

In practice, it appears that there is no common procedure for *determining* proportionate punishment for criminals with mental issues, and consequently, there may be no correlation between the degree of impairment and the sentence. Accordingly, some scholars have gone so far as to opine that Iran's CJS does not incorporate the determination of sentencing based on the degree of criminal responsibility.⁷⁰ Also, both the *Islamic Penal Code* (2013) and the *Criminal Code of Procedure for Public and Revolutionary Courts* (2013) more clearly define and refer to the insanity defense. Similarly, legal discourse about psychological abnormality is centered on the insanity defense and there is much less reference to *mitigating* or *determining* punishment based on a mental condition.⁷¹ As such, it would seem that in circumstances where the mental condition is

⁶⁷ Article 38(c), Islamic Penal Code.

⁶⁸ Article 18(a), Islamic Penal Code.

⁶⁹ Articles 37 and 19, Islamic Penal Code.

⁷⁰ Ali Mahmoudi Ghafar et al., *Evaluation of Momentary Insanity of the Defendant at the Time of Committing the Crime: Criminal Cases Referred to Forensic Psychiatry Commission of Provinces of Lorestan and Ilam in 2006-2007*, 19 FORENSIC LAW 351 (2014); Asghar Mehrnia & Abulghasem Fallahi, *Evolution of the Concepts of Insanity and Criminal Responsibility in Islamic Penal Code of Iran*, 4 TA'LI HOUGHUGH 135 (2013); Behzad Joodaki & Mahmoud Abbasi, *Enforcement of Sentences against Insane Person in Iranian Criminal Law*, 8 IRAN. J. MED. LAW 101 (2014); Mansur Rahmdel, *Mental Illness and the Burden of Proof in the Criminal Justice System of Iran*, 9 PRIV. LAW 5 (2005); Atefeh Abbasi & Abbas Mansourabadi, *Burden of Proof of Mental Disorders in the Criminal Justice Process*, 43 J. PRIV. LAW STUD. 235 (2013). It is noteworthy that while these scholars differentiate between determining and diminishing the sentence, they still use 'diminishing' to describe both situations.

⁷¹ From personal experience, I am aware that a number of lawyers and judges in Iran do not recognize reduced responsibility. For some, a mental condition that is not severe enough to establish legal insanity is irrelevant to sentencing the offender. In other words, criminal responsibility is a binary matter, a person is either fully responsible or legally insane (with no criminal responsibility). This attitude suggests that it is not common for judges to consider *mitigating* the sentence where some mental issues existed at the time of the crime. There-

not severe enough to result in a successful insanity defense, its relevance to sentencing may be overlooked.⁷²

Interestingly, in Article 36 of Iran's Penal Code of 1973⁷³ (in contrast to the current criminal code's definition of the insanity defense) the Act also referred to circumstances where the accused's mental condition was not severe enough to meet the insanity defense. It was noted that the sentence could be *mitigated* where the ability to control acts and to differentiate between right and wrong were partially impaired at the time of the offense. This act was not referring to *determining* an appropriate punishment based on proportionality, but did at least provide a basis for mitigating the punishment where mental issues contributed to the crime. This section was removed in subsequent criminal acts and there is no clear reason for this decision.⁷⁴

Overall, acknowledging that this study is limited in that it has not empirically reviewed the criminal cases involving neuroscientific evidence, it seems that even if courts find brain impairment to be a condition similar to mental issues, it is more likely that judges would find neuroscientific evidence to contribute to the criminal proceeding where the insanity defense is raised, rather than a justification for mitigating the punishment (the summary of the applicability of the insanity defense and mitigating and aggravating factors in Hadd, Qisas, Dyyeh, and Ta'zir is illustrated in Figure 1).

THE APPLICABILITY OF NEUROSCIENCE: LEGISLATION, AND ISLAMIC SOURCES AND FATWA

As noted earlier, the above discussions about the insanity defense and the sentencing of the offender were based on the *assumption* that Iran's CJS acknowledges the influence of brain impairment on an individual's behavior (ie controlling acts) and their mental condition (ie capacity to differentiate wrong from right).⁷⁵ Since the *Islamic Penal Code* (2013) makes no reference to brain impairment (or biological abnormalities in general) and its relationship with criminal responsibility and sentencing, it seems that Iran's CJS is only familiar with mental conditions (I will return to this point in the following paragraph). For instance, only 'psychological disorders' are mentioned as factors that can lead to the insanity defense⁷⁶ or, in determining Ta'zir punishment, only the offender's 'mental and psychological conditions' are outlined.⁷⁷ However, in cases where Ta'zir punishment has a negative influence on the *illness* of the offender, or where the *illness* adds to the custodial hardship (as previously discussed in 'Mitigating and aggravating factors in sentencing' section), 'illness' may be interpreted more widely than just mental issues to include physical illness or brain impairment.

It is noteworthy that the mere fact the *Islamic Penal Code* (2013) makes no reference to brain impairment does not mean that Iran's CJS or courts do not recognize brain

fore, it seems that both *determining* considerations and *mitigating* factors are overlooked by judges while sentencing criminals with a mental condition or brain impairment at the time the crime was committed.

⁷² See Rahmdel, *supra* note 70, at 20; Armin Alimardani et al., *The Influence of Mental Disorders on Criminal Behavior and Different Degrees of Criminal Responsibility*, 35 J. MED. COUNC. IRAN 61 (2017).

⁷³ The title of this Act is 'General Criminal Law'.

⁷⁴ No reason has been found for this decision. See Rahmdel, *supra* note 70, at 20.

⁷⁵ Conditions such as custodial hardship caused by brain impairment seem to be more easily acknowledged by Iran's CJS than the complex matter of criminality due to brain abnormality.

⁷⁶ See Article 149, Islamic Penal Code.

⁷⁷ See Article 18(a), Islamic Penal Code.

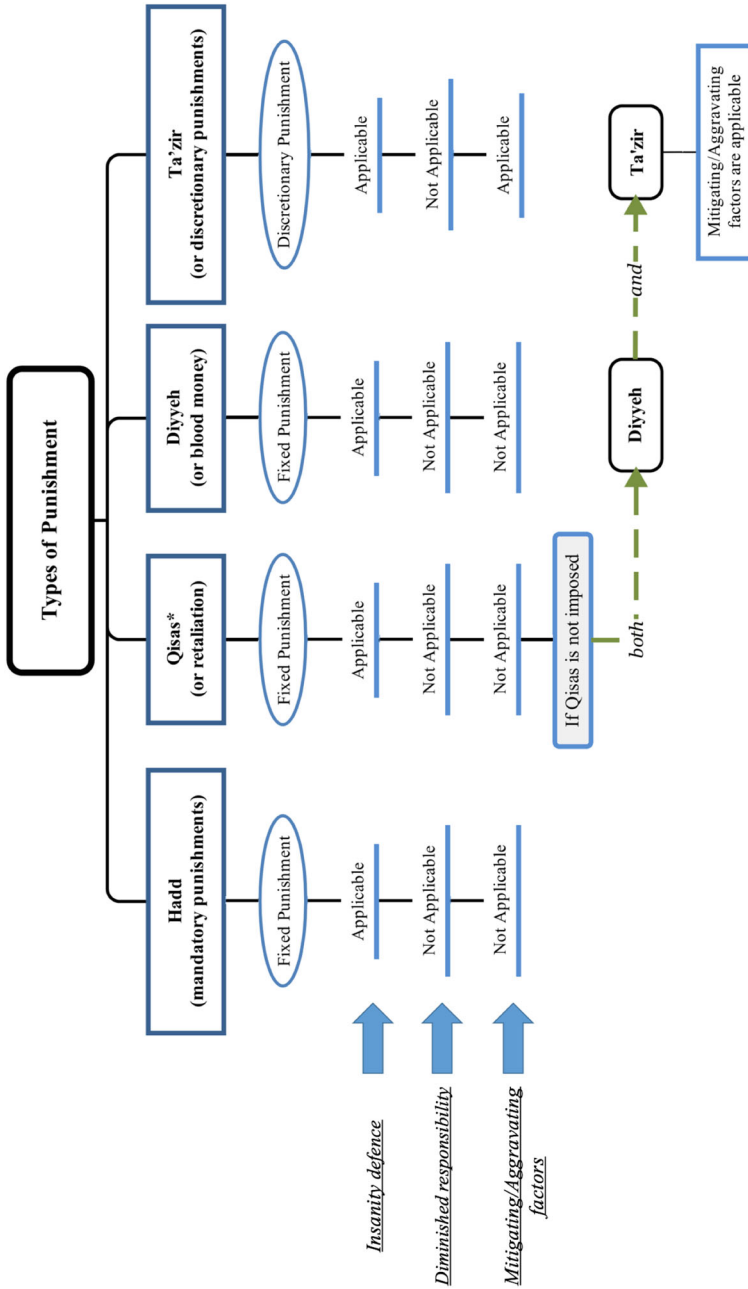


Figure 1. Different types of punishments and applicability of insanity defense, defense of diminished responsibility, and mitigating and aggravating sentencing factors.

impairment and its relationship with criminal responsibility and sentencing *in practice*. The penal codes of some other countries also omit specific mention of brain impairment, and yet in practice neuroscientific evidence is considered in legal proceedings.⁷⁸ However, one reason to be concerned about the assumption that Iran's CJS acknowledges mental conditions and the influence of brain impairment on an individual's behavior is the change to the Penal Code of 1973 regarding conditions that may establish the insanity defense. Article 36 of this code does not refer to 'psychological disorders', and instead mentions 'congenital' and 'adventitious' causes as grounds for raising the insanity defense. The use of the terms 'congenital' and 'adventitious' may mean that the legislator intended to consider a wide array of factors including brain abnormalities. The exclusion of these terms in the subsequent criminal codes and their replacement with 'psychological disorders' in the current criminal code implies a narrower range of factors, which may no longer include brain conditions.

If judges do not interpret the Islamic Penal Code in a way that means brain impairment falls within the category of psychological or mental conditions, or more broadly, they do not find that brain impairment is associated with psychological or mental conditions, it may mean that the act is unclear about the role of brain impairment in sentencing. Principle 167 of the Constitutional Law (1979) requires judges to adopt Islamic sources or fatwa (legal opinion of Marja'-e-Taqlaed) where there is a gap in legislation. Since neuroscience began to flourish in 20th century⁷⁹ and is a relatively new field, Islamic sources (ie Quran) do not address the question of brain impairment and criminality. This means that it is the responsibility of Marja'-e-Taqlaed to answer this enquiry. There is no evidence that this question has been asked of any of the Marja'-e-Taqlaed. Therefore, to evaluate the Marja'-e-Taqlaed's legal opinions, I refer to another study in Iran about genetics and crime⁸⁰—a different biological factor.

According to my research, in 2012 some enquiries were made to five Marja'-e-Taqlaed⁸¹ in Iran to understand if they recognize the association between genes and criminal behavior and if this relationship can be used as evidence in criminal courts. None of the Marja'-e-Taqlaed permit the use of genetic evidence for fixed punishments—Hadd and Qisas (and Diyyeh). However, with respect to Ta'zir they have different opinions. Two of the Marja'-e-Taqlaed (Ayatollah Sobhani⁸² and Ayatollah Alavi Gorgani)⁸³ were against the use of genetic evidence for the purposes of diminishing the punishment and establishing the insanity defense.

⁷⁸ For instance, Stephen Morse in 'Lost in Translation?: An Essay on Law and Neuroscience' explains that in the USA criminal law's criteria of criminal responsibility is not biological abnormalities but only matters of the individual's mental state. That said, empirical studies in the USA indicate that courts find evidence of brain abnormality relevant to criminal procedure. See Stephen Morse, *Lost in Translation?: An Essay on Law and Neuroscience*, 13 in *LAW AND NEUROSCIENCE, CURRENT LEGAL ISSUES* 529, 530–31 (Michael Freeman ed., 2011); Denno, *supra* note 8.

⁷⁹ See ROSE & ABI-RACHED, *supra* note 34, at 25–52.

⁸⁰ ALIMARDANI ET AL., *supra* note 10, at 170–72.

⁸¹ Marja'-e-Taqlaed were chosen based on the discretion of the authors. The elements used in choosing Marja'-e-Taqlaed included their popularity, their experience in legal and political positions, and geographical locations (where their offices are located) in the country.

⁸² For more information about this Marja'-e-Taqlaed, see Jafar Sobhani, *Grand Ayatollah Jafar Sobhani's Office Information Website*, <http://tohid.ir> (accessed Jan. 18, 2018).

⁸³ For more information, see Seyed Mohammad Ali Hosseini Alavi Gorgani, *Grand Ayatollah Seyed Mohammad Ali Hosseini Alavi Gorgani's Office Information Website*, <http://www.gorgani.ir> (accessed Jan. 18, 2018).

Ayatollah Sobhani noted that explaining crime by genetic factors would help criminals to get away with their crime. Ayatollah Alavi Gorgani stated that as God is aware of everything, using genetics as a sentencing factor is not permissible, otherwise God would have noted it (ie in Quran).

The other three Marja'-e-Taqleed (Ayatollah Gerami,⁸⁴ Ayotallah Makarem Shirazi,⁸⁵ and Ayatollah Musavi Ardebili)⁸⁶ agreed that genetic evidence can be used as a mitigating factor, but they had different opinions regarding the insanity defense. Ayatollah Gerami stated that genetic evidence can be used as a basis for the insanity defense. Ayotallah Makarem Shirazi approved that use of genetic evidence for the insanity defense; however, he found it farfetched that genetic factors could completely remove an individual's behavioral control. Ayatollah Musavi Ardebili did not believe that the influence of genes is significant enough to make an individual lose control.

Since every judge may follow a different Marja'-e-Taqleed, relying on the opinions of Marja'-e-Taqleed may result in inconsistent decisions by courts. As noted earlier, the same issue is evident regarding applications for sex change surgery.⁸⁷

Overall, the discussions above indicate that if neuroscientific evidence is being used in courts, there is a possibility of inconsistency in judicial decisions with regard to its applicability. Clearly, acknowledging the applicability of neuroscience (or biological factors generally) in future legal codes could be a step towards consistent judicial decisions on matters involving neuroscience. That said, the lengthy process of passing legislation is a considerable issue in Iran. For instance, the Islamic Penal Code (1991) was an experimental act that was supposed to be terminated and updated in five years; however, this process took approximately 22 years.

The conclusions and discussions in this section are subject to certain limitations. First, it was not possible to access cases in which neuroscience was used by courts; therefore, it is unclear whether courts recognize neuroscience as applicable to Iran's CJS, and whether it is seen to be relevant to the individual's criminal responsibility and sentencing. Second, Marja'-e-Taqleed opinions were consulted in regard to the applicability of genetics. While both genetics and neuroscience are areas only relatively recently considered in the legal context and have roots in the biological sciences, there are some differences between these two areas that may lead to different opinions by Marja'-e-Taqleed. Accordingly, for more insights into the use of neuroscience in Iran's CJS, further studies, which take these methodological limitations into account, will need to be undertaken.

Having discussed the circumstances in which neuroscience may be relevant to Iran's Criminal Law, the following section of this paper describes the procedural matters of

⁸⁴ For more information, see Mohammad Ali Gerami Qomi, *The Official Website of Grand Ayatollah Gerami*, <http://www.ayat-gerami.ir> (accessed Jan. 18, 2018).

⁸⁵ For more information, see Naser Makarem Shirazi, *The Official Website of Grand Ayatollah Makarem Shirazi*, <https://makarem.ir/index.aspx?lid=1> (accessed Jan. 18, 2018).

⁸⁶ For more information, see Seyyed Abdul-Karim Mousavi Ardebili, *Grand Ayatollah Mousavi Ardebili Official Website*, <http://www.ardebili.com/EN/Home/Index/> (accessed Jan. 18, 2018).

⁸⁷ Sex change surgery in Iran requires court permission; however, none of the acts have recognized transsexuality. As noted above, according to Principle 167 of the *Constitutional Law* (1979), judges should explore Islamic Law to fill the gap in the legislation. Nine Marja'-e-Taqleed allow this surgery while many others are against it. As the result of different Islamic opinions about sex change surgery, some courts in Iran permit this surgery, while others do not. See Vahedi et al., *supra* note 21, at 44–45; Saeidzadeh, *supra* note 19, at 259.

the use of neuroscience in the CJS. Again, in this section discussions are based on the *assumption* that neuroscience is applicable within Iran's CJS in a similar way to evidence of mental condition.

NEUROSCIENTIFIC EVIDENCE IN CRIMINAL PROCEDURE

The use of neuroscientific evidence in courts has been criticized based on the scientific limitations of neuroscience and its unreliability as evidence.⁸⁸ While I have no intention of discussing whether neuroscientific evidence *should* be admitted into the courts or not, it is still important to know how courts may react to the submission of neuroscientific evidence based on the rules of admissibility. In the first part of this section, I will discuss the admissibility of neuroscientific evidence and how it may prove a factual matter within Iran's CJS. In the second part of this section, I will discuss the stages of criminal procedure at which neuroscientific evidence may be raised, as well who may submit this evidence and for what purpose.

Admissibility and standard of proof

Rules of admissibility in Iran's criminal law are mostly focused on proving a crime based on the standard of proof. When it comes to expert evidence, there are no specific rules for declaring expert reports inadmissible as in other justice systems.⁸⁹ If the judge is doubtful about the certainty and reliability of expert evidence, he/she can request other experts to provide evidence about the subject of the report.⁹⁰

Under Iran's Penal Code, the standard of proof is the 'knowledge of the judge'. Article 211 of this act defines 'knowledge of the judge' as the *certainty* arising from the evidence presented to the court.⁹¹ This means that for a factual matter to be proven, the judge must consider that all the submitted evidence is sufficient for him/her to be certain about the factual matter. While the degree of 'certainty' required is not defined clearly, it seems to be a relatively high standard.

In accordance with this high standard, the opinion of an *expert* is necessary for diagnosing mental abnormalities and establishing the insanity defense⁹² (it also means that *if* neuroscientific tools are used, they are always evaluated by experts). That said, it appears that experts only outline the conclusion of their assessment and do not elaborate on the approaches and tools that they used. It is not clear how judges evaluate expert's report to meet the degree of 'certainty' required. It seems that there is a level of trust placed in experts' reports by courts. One reason for this trust is that forensic experts work for the CJS and are chosen based on a set of criteria to ensure they are qualified. Further, experts are generally called by the judge and interrogator and not by the defendant or the prosecutor. This may increase independence and reduce partisan evidence.⁹³ However, the interrogator and the judge are not obliged to accept the

⁸⁸ For instance, see W. Glannon, *What Neuroscience Can (and Cannot) Tell Us about Criminal Responsibility*, in 13 LAW NEUROSCIENCE CURRENT LEGAL ISSUES (Michael Freeman ed, 2011).

⁸⁹ *Daubert* in the United States. See David McClure, *Focus Group on Scientific and Forensic Evidence in the Courtroom*, NATL. INST. JUSTICE 1 (2007). Also see *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993).

⁹⁰ Article 165, Criminal Code of Procedure.

⁹¹ Article 211, Islamic Penal Code.

⁹² Abbasi & Mansourabadi, *supra* note 70, at 246.

⁹³ While some may suggest that this increases independence and reduces partisan evidence, others may argue that the expert may be biased in favour of prosecution as both parties work for CJS.

expert opinion.⁹⁴ To exclude expert evidence from the criminal procedure, the judge and interrogator must provide reasons⁹⁵ such as that the facts and circumstances of the crime do not correspond with the expert opinion, or when there are contradictory expert opinions.

While the inquisitorial system, as I will explain in more detail below, has provided some approaches for judicial officers to address such contradictions, there is no cross-examination in the inquisitorial system to allow questions to be raised over how an expert reached their conclusion. As such, it appears that the approaches and tools used by experts are not the subject of argument, and instead challenges are directed at the conclusions drawn. For instance, an expert may use *different types of brain imaging techniques* (approaches and tools) and state that *some brain abnormalities caused the criminal behavior such that the offender could not understand what she/he was doing at the time of the crime and is therefore legally insane* (findings and conclusion). In this scenario, as experts do not elaborate on their approaches—ie which types of brain imaging techniques were used to diagnose the brain abnormality—any objection is related to the conclusion that the individual is legally insane. For instance, contradictory evidence may be adduced by a witness claiming that the defendant could understand his/her acts.

Relying on the conclusions drawn by experts is a matter of concern in Iran's CJS. If an expert uses a relatively unreliable neuroscientific tool in finding an outcome and the limitations of that tool are ignored, the expert report may skew the court's decision regarding the offender's mental condition.

Raising neuroscientific evidence

The inquisitorial system within Iran's CJS has created the potential for neuroscientific evidence to be used during two stages of the criminal procedure: investigation and trial.

The inquisitorial criminal system requires investigation and evidence gathering to be conducted by the prosecutor and the interrogator. If, during the investigation, the interrogator suspects that the accused was insane at the time of the crime, he/she should conduct an interview of the accused's relatives and friends, and request a forensic assessment. If insanity is established, the interrogator sends the case to the prosecutor to confirm the insanity of the accused. If this occurs, the investigation of crime is terminated and the accused acquitted.⁹⁶ Similarly, if, during the trial, the judge suspects that the accused was insane at the time the crime was committed, the same procedure should take place at the initiation of the judge⁹⁷ (in this case, there is no need for the prosecutor's confirmation).

Another way of raising neuroscientific evidence is for the defense to directly request a mental assessment. However, this requires the permission of the interrogator or the judge during the investigation and trial⁹⁸ and the expert is chosen at the court's discretion, rather than by the defendant.⁹⁹

⁹⁴ Articles 165–66, 202 and 370, Criminal Code of Procedure.

⁹⁵ Articles 165–66, Criminal Code of Procedure.

⁹⁶ Article 202, Criminal Code of Procedure.

⁹⁷ Article 370, Criminal Code of Procedure.

⁹⁸ Article 155, Criminal Code of Procedure.

⁹⁹ Articles 155–56, Criminal Code of Procedure.

For more severe crimes¹⁰⁰ (ie crimes that according to the Penal Code have a minimum punishment of more than five years of imprisonment),¹⁰¹ a request for a Personality Dossier (PD) by the interrogator is compulsory during the pre-trial investigation.¹⁰² The PD includes a social worker's report about the family and social situation of the accused, as well as medical and psychiatric reports.¹⁰³ This can mean that if there are some records of brain abnormalities in the medical history of the accused, or if an abnormality is revealed during the medical and psychiatric examinations, these are included in the case report and submitted to the court. Unfortunately, while it is compulsory to request a PD for severe crimes, it seems that this requirement is rarely complied with in practice.¹⁰⁴

It may be that the expert report requires further explanation or investigation. The inquisitorial system permits further explanation by the expert at the request of the judge or interrogator.¹⁰⁵ If the expert report indicates that the accused needs further assessment by experts from other areas (for instance, the psychological report suggests an abnormality in the brain), the judge and the interrogator can request the opinion of other experts.¹⁰⁶ The defendant can also ask for a further expert opinion or for further assessment by experts from other areas, but the judge or interrogator must give permission for this request and the court choose an appropriate expert.¹⁰⁷

Reports by different experts, in particular from different areas of expertise, may result in contradictory opinions and confusion for courts. To resolve this issue, the court may request further explanation from the same experts or request a new forensic expert opinion. Another way to deal with this issue is to request a *special forensic committee*. In discussions about medicine and related areas during the investigation and trial,¹⁰⁸ special committees may be organized in a number of circumstances in order to increase the accuracy of the forensic (medical) evaluation. These circumstances include cases where there is a need for special expertise and when experts' opinions are contradictory.¹⁰⁹ The committee members are selected according to the features of each specific case. For instance, a neurologist might be invited when the brain is under investigation. If the committee realizes that there is a need for another expert from

¹⁰⁰ This matter applies in all types of crimes. The usefulness of DP in Hadd and Qisas crimes is after determination of the sentence. The DP may support the existence of a mental disorder, and if the punishment worsens the offender's condition, the judge in charge of executing judgements (the executive judge) postpones the punishment after receiving the confirmation of a forensic expert. With respect to Ta'zir crimes, in cases where the punishment increases the severity of the illness the executive judge postpones the punishment. However, if there is no hope of treating the offender, the executive judge will send the case to the sentencing court. The sentencing court will consider the illness and the primary punishment then change the sentence to something more appropriate. Articles 489 and 502, Criminal Code of Procedure.

¹⁰¹ Articles 19 and 203, Islamic Penal Code.

¹⁰² Article 203, Criminal Code of Procedure.

¹⁰³ Article 203, Criminal Code of Procedure.

¹⁰⁴ Sara Mohammadian & Babak Mohammadrezapour, *Personality Dossier Necessity in Iran Criminal Process*, 19 IR. J. FORENSIC MED. 321 (2014).

¹⁰⁵ Article 163, Criminal Code of Procedure.

¹⁰⁶ Articles 163 and 165–66, Criminal Code of Procedure.

¹⁰⁷ Article 155, Criminal Code of Procedure.

¹⁰⁸ Article 614, Criminal Code of Procedure. This reference to the special committee might also occur when the defendant or the judge objects to the expert's opinion.

¹⁰⁹ Regulation of the Instruction of Special Medical Committees in the Forensics Organisation (1993).

a different area, it is possible for such an expert to be added to the committee.¹¹⁰ To receive more reliable reports from the committee, some criteria are determined for the selection of committee members, such as choosing more experienced and knowledgeable individuals.¹¹¹ Each member of the committee evaluates the case based on their specialized knowledge but members discuss the case with one another and determine the final opinion collaboratively.¹¹² The initial committee is composed of at least three experts, but if the judge or interrogator is not satisfied with their opinion, or one of the parties make a compelling objection, the case can be sent to a higher committee composed of different experts.¹¹³ This procedure might be repeated until the case is sent to a 'central committee', composed of the highest ranked experts in the relevant areas.¹¹⁴

CONCLUSION

The main goal of the current study was to determine the potential applicability of neuroscientific evidence in Iran's CJS for the purposes of evaluating criminal responsibility and assessing the sentence. This study has shown that neuroscientific evidence can be used for different purposes, including establishing the insanity defense and mitigating or determining the punishment. While the latter application is limited to Ta'zir punishments, Ta'zir forms the majority of punishments in Iran's criminal code. The paper also concluded that there are many opportunities for the use of neuroscientific evidence in Iran's CJS.

That said, there are a number of issues that may prevent the use of neuroscience in criminal proceedings. One of these problems is that Iran's Penal Code is generally concerned with *mental* and *psychological matters*, and as this study has not empirically reviewed the criminal cases involving neuroscientific evidence in practice, it is unclear whether judges consider *brain* impairment a relevant factor in determining the sentence or as a basis for establishing the insanity defense. A source that could provide guidance on this issue is Marja'-e-Taqleed legal opinions. However, with regard to the use of genetic evidence in criminal courts, Marja'-e-Taqleed have different opinions. Similarly, it might be the case that Marja'-e-Taqleed have different views about applicability of neuroscience which may result in inconsistent legal decisions.

Undoubtedly, if the Parliament chose to include brain condition in the Penal Code, similarly to the Criminal Law of 1973, the use of neuroscience in criminal courts would be more likely in practice and this also would prevent any inconsistent decisions by courts. Regrettably, legislative reform in Iran is a lengthy process and, as a result, the inclusion of brain impairment in the Penal Code may not happen in the near future.

¹¹⁰ Article 7, Note 3, Regulation of the Instruction of Special Medical Committees in the Forensics Organisation (1993).

¹¹¹ Articles 4 and 7, Regulation of the Instruction of Special Medical Committees in the Forensics Organisation (1993).

¹¹² Articles 13 and 14, Regulation of the Instruction of Special Medical Committees in the Forensics Organisation (1993).

¹¹³ Articles 17, Regulation of the Instruction of Special Medical Committees in the Forensics Organisation (1993).

¹¹⁴ Articles 18, Regulation of the Instruction of Special Medical Committees in the Forensics Organisation (1993).

ACKNOWLEDGEMENTS

Special thanks to Rozita Hasani (Lawyer), Dr Behnam Youssefian (Lawyer), MohammadReza Behrouzih (Judge), Mostafa Vahedi (Judge), Mohammad DaneshPazhooh (Lawyer), and others who provided insight into, and expertise of, the Iranian Criminal Justice System, as well as information about applicability of neuroscience in practice.

I am also immensely grateful to Oliver Ray for editorial assistance and Dr Allan McCay, Professor Nicole Vincent, Brianna O'Shea, Milda Istiqomah, Megan McElhone, Joe Chigwidden, and Joseph Hoare by providing feedback that greatly improved the manuscript.