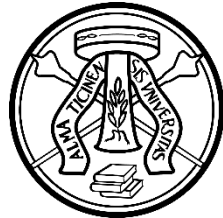


UNIVERSITY OF PAVIA – IUSS SCHOOL FOR ADVANCED STUDIES PAVIA

Department of Brain and Behavioral Sciences (DBBS)
MSc in Psychology, Neuroscience and Human Sciences



UNIVERSITÀ
DI PAVIA



IUSS

From Mild to Severe: Analyzing the influence of Neurological and Psychological Disorders on Judicial Decision Making

Supervisor:
Prof. Andrea Lavazza

Thesis written by:
Madhulika Jaldeep Bhansali
514464

Academic year 2023-2024

Table of Contents

<u>ABSTRACT.....</u>	<u>3</u>
<u>INTRODUCTION.....</u>	<u>4</u>
<u>CHAPTER 1- LAW AND MENTAL DISORDERS.....</u>	<u>6</u>
1.1 THE EFFECTS OF MENTAL AND NEUROLOGICAL ILLNESSES ON THE LEGAL SYSTEM	6
<u>CHAPTER 2 - STATE OF THE ART OF LAW AND PSYCHIATRY</u>	<u>10</u>
2.1 EFFECTS OF NEUROLOGICAL AND PSYCHOLOGICAL DISORDERS ON CRIMINAL BEHAVIOURS.....	10
2.2 INSANITY DEFENCE.....	11
2.3 BIAS OF COURTS	12
2.4 INFLUENCE ON JURY AND CRIMINAL JUSTICE SYSTEM	14
2.5 IMPLICATION OF BIAS IN JUDICIAL SYSTEM.....	15
2.6 CRIMINAL BEHAVIOUR	16
2.7 NEUROLAW : LAW AND NEUROSCIENCE	18
<u>CHAPTER 3- AN EMPIRICAL STUDY: A SURVEY OF NON-EXPERTS' ATTITUDES</u>	<u>20</u>
3.1 RESEARCH DESIGN	20
3.2 METHODOLOGY.....	22
3.2.1 QUESTIONNAIRE DESIGN	22
3.2.2 DATA VALIDATION.....	24

3.3 EMPIRICAL METHODOLOGY	24
3.4 ETHICAL CONSIDERATIONS	27
3.5 RESULTS	27
3.5.1 HYPOTHESIS 1 (PERCEPTION OF CRIMINALITY).....	27
3.5.2 HYPOTHESIS 2 (PERCEPTION OF CULPABILITY)	28
3.6 INTERPRETATION.....	30
3.7 IMPLICATIONS.....	32
3.8 LIMITATIONS AND RECOMMENDATIONS.....	33
<u>CHAPTER- 4 CONCLUSION</u>	<u>35</u>
<u>BIBLIOGRAPHY</u>	<u>37</u>
<u>ANNEXURE.....</u>	<u>46</u>

Abstract

This study looks at how judicial decision-making is affected by neurological and psychiatric diseases, specifically how judgments of criminal accountability and guilt are influenced by the type and degree of the disorder. The legal system still harbours a substantial prejudice that influences the way crimes committed by people with mental health illnesses are assessed, despite increased knowledge of these disorders. Through the examination of data from a heterogeneous set of participants serving as a stand-in jury, one discerns trends in the perceived responsibility of defendants suffering from mild and severe illnesses. The results show that people with psychological problems are more likely to experience bias about their culpability, while people with neurological diseases are more likely to experience stigma associated with criminal liability. The research also emphasises how demographic variables, such as gender and level of education, have an impact on these views. The study has certain limitations, such as a small sample size and the absence of a neutral control group, but it nonetheless highlights the importance of increased legal knowledge and careful handling of situations involving mental health illnesses. To ensure that defendants with varied degrees of neurological and psychological problems are treated fairly, my results urge for judicial reforms.

From Mild to Severe: Analysing the influence of Neurological and Psychological Disorders on Judicial Decision Making

Introduction

It has long been known that mental health conditions, both neurological and psychological, have a major impact on cognition and behaviour in people. The recognition of these factors' potential influence on criminal behaviour is growing along with our understanding of them. But the connection between psychological wellness and criminal justice presents complex moral and legal issues regarding accountability, blame, and culpability. Determining the degree to which neurological and psychiatric problems affect a person's capacity for understanding or self-control is a challenge that courts are increasingly confronted with. Biases and misunderstandings can make it more difficult for the legal system to treat certain matters fairly, which could result in different legal outcomes.

Crimes perpetrated by people suffering from neurological or psychological conditions are often viewed through the prism of institutional and societal prejudice. Psychological conditions like schizophrenia, bipolar disorder, and personality disorders can arouse feelings of uncertainty or threat, which frequently leads to more severe assessments of guilt and accountability. On the other hand, neurological conditions such as dementia, traumatic brain injury, or epilepsy could elicit more sympathy, especially when it comes to criminal responsibility.

In order to investigate these prejudices, this study examines how people with neurological and psychological problems are viewed in the legal system, with a particular emphasis on how the type and degree of the disorder affect how decisions are made.

The study also investigates how views of mental health illnesses in legal settings are influenced by demographic characteristics, including age, gender, education, and professional background. This study looks for trends in the scoring of crimes committed by people with neurological and psychological illnesses by examining data from a large sample of proxy jurors. It explores if the perception of leniency towards individuals with severe disorders is greater than that of those with moderate diseases, and whether or not there are discernible distinctions between the treatment of neurological and psychiatric disorders with respect to criminal responsibility and guilt. Recognizing the biases that might affect the decisions made by judges in situations involving mental health concerns begins with these inquiries. Since it is a pilot study, it has various limitations like a small sample size, lack of a neutral control group and further research is necessary.

Eventually, however, the study contributes to the ongoing discussion over how the legal system ought to treat those who experience mental health problems fairly. It aims to highlight the uneven nature of court decisions and reveal any potential biases in order to encourage a better informed and objective approach to matters pertaining to mental health. It is expected that the findings would draw attention to the need for more knowledge and training throughout the legal system, laying the way for fair court processes that take the complexity of neurological and psychological disorders into account when determining the guilt of criminals. As a pilot study, it has a number of drawbacks, including a small sample size, the absence of a neutral control group, and there is a need for additional research.

Chapter 1- Law and Mental Disorders

The interaction between law, neuroscience and psychology is a complex yet an increasingly significant field for modern research scholars. The advancement in neuroscience is becoming useful in the never-ending challenges of the legal system and helping in reforms in law and policy making. There is a lot of stigma and bias regarding neurological and psychological disorders not only in the world but also the judicial system, but this advancement is improving this situation as more knowledge and information is discovered and more awareness is being spread (Goodenough, O. R., & Tucker, M., 2010).

Commonly throughout the world, the legal system framework is based on the assumption that a person who has committed a crime and is held responsible for the act has the freedom of choice to refrain from committing the act (Hart, 2008). For an act to be considered criminal and the offender liable for it, the person must have mens rea (intention or knowledge of wrongdoing) in addition to actus reus. The issue arises when a person with a neurological or psychological disorder commits a crime, mens rea and actus reus may not be applicable to them. They may lack the awareness of the fact that they are committing a crime or may not have the intention to commit a crime under the influence of various factors like hallucinations, traumatic flashbacks or other neurodegenerative factors (Tsimploulis, G., Niveau, G., Eytan, A., Giannakopoulos, P., & Sentissi, O., 2018).

1.1 The effects of mental and neurological illnesses on the legal system

The legal system has a number of difficulties in determining guilt and responsibility when a person acts while suffering from neurological disorders, traumatic flashbacks, or mental hallucinations (Slovenko, R. 1995). Neural systems linked to self-awareness, sexual

behaviour, aggression, judgement, executive function, and emotional processing can malfunction as a result of neurodegenerative disorders. These flaws may lead to antisocial behaviour that is deemed unlawful by society.

Patients with a variety of illnesses, including Alzheimer's disease (AD), frontotemporal dementia (FTD), and others, have been shown to exhibit several disagreeable behaviours that they have never before engaged in antisocial activity (Liljegren et al., 2015). According to a study, degeneration of the frontal and temporal lobes is associated with antisocial behaviour, disinhibition, and violence. The pathology in AD is posterior temporal parietal, while the pathology in FTD is anterior fronto-temporal (Miller et al, 1997). Common dementia symptoms that can lead someone diagnosed with the disease to conduct crimes include paranoia, impulsivity, disinhibition, and indifference (Cipriani et al., 2016). People with dementia present a big problem to the legal system because they raise a lot of questions about things like whether or not they should be punished, if they are competent to stand trial, and what kind of sentence is suitable (Dufner, 2013; Mendez, 2010; Sfera, Osorio, Gradini, & Price, 2014). Such questions being raised not only causes awareness regarding trials being conducted in a certain way but also the issue of bias in decision making.

The second most common neurodegenerative disease in the world, Parkinson's disease, was the subject of a study that examined the state of knowledge regarding the condition, including its aetiology, symptoms, and application to the legal system. It demonstrated how illnesses that coexist with one another can have negative effects, such as making a person incompetent to stand trial and significantly altering the sentence imposed on them. It further contended that a different strategy for providing healthcare is required, particularly for those with Parkinson's, FTD, and AD (Freckelton and others, 2022).

Schizophrenia is another category of condition that has been researched. It is a chronic disease and common symptoms include delusions, hallucinations, disorganised speech, social withdrawal, anhedonia, and lack of motivation (American Psychological Association, 2013).

Schizophrenia is linked to higher rates of violent crime and violence, even though the majority of those with the disease are neither dangerous or violent (Singh, Grann, Lichtenstein, Langstrom, & Fazel, 2012). Additionally, individuals with schizophrenia were investigated. Both chronic and first-episode patients with schizophrenia showed significant impairments on several categories of decision making performance according to their findings (Hutton et al. 2002). In another study conducted on individuals with schizophrenia and bipolar disorder, the triggers they were exposed to, like exposure to violence, self-harm, unintentional injuries, substance intoxication and parental bereavement, all contributed to higher risks of violent crime among patients with psychotic disorders a week after they occurred compared to earlier periods within the same individuals (Sariaslan et al, 2016).

Scientific studies have shown that there is a direct influence of our biology on criminal behaviour (Glenn et al, 2014). There is extensive literature documenting the relationship between antisocial behaviour and biological functioning (Raine et al,2013). A large number of studies testing whether specific biological factors like hormone levels, neurotransmitters etc are predictors for future offences (Tuvblad, C. et al, 2013). The use of various neuroscientific approaches and techniques in criminal courts is sparking a discussion about whether or not these techniques should be accepted as scientific evidence. It was discovered that neurobiological data presented through the testimony of specialists is typically utilised to highlight a brain lesion or other abnormality that is claimed to have impacted a person's ability to reason or control their impulses, or to show the foundation of a mental illness (Gkotsi, Gasser, & Moulin, 2018). Reduced functioning in the frontal lobe of the brain till

date is the best-replicated brain imaging correlate of antisocial and violent behaviour (Yang et al, 2009).

Brain injury studies in supposedly normal individuals suggest that head injuries could be an initial cause of antisocial behaviour, which raises the possibility of a pivotal relationship between impaired orbitofrontal cortex structure and crime or violence. It has been suggested that Traumatic Brain Injury (TBI) sometimes leads to aggressive behaviour through outcomes such as behavioural dysregulation or impulsiveness which causes individuals to in many cases become more violent and involved in criminal acts (Schofield et al, 2015). One of the landmark cases in which some particular brain lesions lead to criminal behaviour was that of Charles Whitman. He murdered 16 people after the growth of a tumour in his brain.

Lesion induced symptoms can usually come from sites connected to the lesion location and not the location of the lesion itself. A recent technique termed as lesion network mapping has identified regions that are involved in symptom generation across a variety of lesion induced disorders. The same network of brain areas was functionally linked to each lesion (Nabizadeh, F., & Aarabi, M. H., 2023). Comparing this criminality-associated connection pattern to lesions, causing four other neuropsychiatric diseases, it was distinct. This network does not include regions related to empathy or cognitive control, but it does include regions related to theory of mind, morality, and value-based decision making (Darby et al, 2018). In the case of war veterans with brain injuries localised to the prefrontal cortex, for instance, increased levels of aggression were sometimes seen (Grafman, J. et al,1996).

Chapter 2 - State of the Art of Law and Psychiatry

2.1 Effects of neurological and psychological disorders on criminal behaviours

Environmental, biological and psychological issues could have various influences which can impact an individual's behaviour negatively and cause tendencies that are more criminally inclined and out of societal bounds. Neurological and psychological disorders could have a major impact on an individual's behaviour or personality. These disorders can sometimes cause an individual to commit crimes or cause harm to people around them. The main issue arises when there is a legal proceeding for such cases and having the disorders could cause a bias amongst the jury/judicial system.

A study was conducted which focused on the biological aspects of criminal activity which included neurological and neuropsychological aspects, and reviewed the various attributes like violence etc to such behaviour. It also explored how expert witnesses could use neurological, and particularly neuropsychological data to address psycho-legal concerns in instances involving the death penalty and murder like free will and moral culpability etc (Fabian, J. M, 2010). The presence of a neurological or a neuropsychological disorder being the cause of commission of the crime is not always true and many times the person committing the crime is aware of their actions.

One other study was conducted to examine the effect on mental health diagnosis due to late adolescence on convictions for violent crimes in the future. Another goal was to research the importance of neurological disorders and various other risk factors. It was found that violent criminal behaviour was seen sometimes in men diagnosed with mental retardation or were

more prone to such activities and that testing of mental retardation should be done for further evaluation of violence risk assessment (Moberg et al, 2015).

Another study was conducted to see the relationship between neuro-biological dysfunctions and genetically determined deviant behaviour, as well as moral abnormalities and personality traits. Research showed proof of inheriting antisocial traits which therefore interfered with moral development and activities. This can therefore have an effect on decision making in the criminal justice system (Martens, W. H, 2002). Genetics are a very important factor in determining character traits of a person but it can't be the only factor as environment, peers etc play a major role in the actions committed by an individual.

2.2 Insanity Defence

The insanity defence is a legitimate defence by excuse in a criminal case which says that the defendant, due to a psychiatric illness, isn't responsible for the crime. This contrasts justification due to provocation or self defence. There are various legal definitions for the insanity defence which varies according to country, but most of them refer to the lack of Mens Rea. But there has to be enough evidence and multiple sessions and tests done in order for the insanity defence to be applicable.

A study was done to assess the variables affecting people's perceptions of the insanity defence. Negative feelings toward the insanity defence were linked to misconceptions about the usage of the argument and favourable views toward the death penalty. It also showed that the most reliable indicator of an unfavourable attitude of the insanity defence was support for the death penalty. These results point to areas for further research that may help lawyers

choose fair juries and offer important new understandings of the causes and perpetuation of bias against the insanity defence.(Bloechl et al, 2007).

According to another triple study conducted, the attitudes toward the insanity defence, legal authoritarianism, and psychiatrists were reliable indicators of conviction-proneness.

Additionally the second research compared two different measures of legal authoritarianism, and the third research examined the reliability and component structure of a newly created instrument meant to measure attitudes toward psychiatrists and the insanity defence (Cutler, Moran, & Narby, 1992).

2.3 Bias of Courts

Bias in jury decision making is a very prevalent factor in the decision making process in court cases. While evaluation of evidence is the key factor in the passing of the verdict, sometimes there is a bias amongst the jury that plays a major role in certain sentences given. This tendency can often lead to errors in the decision. It can lead to distortion of the evidence and favouritism in their preference which is known as confirmation bias. Cases where the insanity defence is raised, the perception and beliefs of the jury towards the plea greatly influences the verdict also causing unfair trials at times. A criminal act is inherently wrong but the offender's responsibility can be reduced or eliminated by the presence of a disorder or illness. But the jurors are only human and bias is inevitable. Also one should be aware that not every disorder is the cause for a crime, and mens rea is usually present.

One such study about this was conducted to understand the thought process behind the jurors decision regarding the insanity plea and it was found that various factors like the severity of

the mental disability, the inability to limit their constructs and the association of the prototypes with the information related to the case (Skeem, J.L, 2000).

According to another study, judges' decisions are greatly influenced by forensic mental health expertise (FMHE), especially when it comes to determining criminal liability and punishment. The result that psychotic defendants are more likely to be found not guilty by reason of insanity than those indicates that FMHE regularly influences the verdict. On the other hand, FMHE has a less constant impact on sentencing, which determines the length and kind of punishment based on variables including perceived behavioural control and recidivism risk (van Es, Kunst, & de Keijser, 2020).

According to a study by Mossiere & Maeder (2015) different student and community samples were used to look into the effects of sample types and the influence of defendant mental illness on juror decision-making. Juror judgments were not significantly influenced by the type of mental illness or attitude ratings. The findings also suggested that the type of sample may be particularly relevant to this research question.

In another study conducted by Mossiere & Maeder (2016), verdict decisions were not influenced by gender. It was suggested that various mental conditions affected how criminal liability was determined. It found that the results from their university sample did not match the results from an earlier community sample regarding attitudes toward forensic patients. Having majored in psychology in college, they concluded that these people were qualified to "make decisions beyond the typical stereotypes of mental illness and common misperceptions of the insanity defence."

2.4 Influence on jury and criminal justice system

A defence attorney who finds themselves representing an individual they suspect has a neurological or psychological disorder has to commission the help of other people like a neurologist or a psychologist etc for assistance in the investigation of the case and to assess the subject. They need to check the history and other risk factors involved etc of the individual regarding signs and symptoms of the disorder that can be seen.

Since neuroscientific evidence has so much potential to influence legal decisions, it is becoming frequent in the field of criminal law. Little is currently understood about this effect. Early research revealed that neuroscience was important for both lay and legal decision making, but further studies have not been able to support or expand on these findings.

A study was conducted by LaDuke, C., Locklair, B., & Heilbrun, K (2018) to determine how various forms of evidence affected an innovative approach to criminal sentencing. Regarding the circumstances of neuroscientific, neuropsychological, and psychological evidence, there were no discernible changes in the mock jurors' assessments of the evidence and sentencing judgments, nor in their opinions of violence risk, recidivism, or guilt.

The jury has numerous responsibilities in adversarial proceedings. They have the ensuing duties to complete: 1) Assess the information provided for accuracy and reliability; 2) weigh your options; and 3) make a decision. By evaluating the evidence rationally and impartially, it is expected that the jury would give the accused a fair trial. Still, research on the psychology of juries has shown that juries are fallible and prone to bias.

Curley LJ, Munro J, and Dror IE's (2002) study was the focus of the review, which sought to identify potential sources of prejudice in juries. The three main sources of prejudice that were highlighted were: Pre-trial bias, expert witness bias, and cognitive bias are the three types of bias that might occur. The review concluded that prejudice is a complex phenomena that is brought about by a variety of factors, and that during a jury trial, a number of bias sources may interact with one another to compound the effects of bias.

Another study was conducted on the impact of mental illness on the decisions made by a mock jury in a criminal case. Since mental illnesses are heavily stigmatised, the assumption, that judgments of the defendant's guilt and case choices would be significantly impacted if the defendant had a mental illness, was made. It showed that defendants with mild or no mental disorders were rated as guilty and thought to have more awareness of their actions as compared to defendants with schizophrenia etc. The verdict, sentence, penalty, and confidence all differed in a negligible way (Garrison Sydney, 2021).

2.5 Implication of bias in judicial system

There has been conflicting evidence in earlier studies evaluating juror attitudes about mental illness and how they affect verdicts and sentences. Breheny et al. (2007) discovered that mock juror judgments were significantly impacted by both gender and mental illness. Comparing defendants with a shorter psychiatric history to those who were going through their first episode of mental illness, participants showed less empathy for the former. Furthermore, participants thought that female defendants had a greater degree of responsibility for their actions and judged them guilty more frequently than male defendants.

Findings from studies on the judiciary's perceptions of mental illness and attitudes toward the death penalty are similar to those from studies on verdicts. Poulson et al. (1997) found a significant relationship between verdict judgments and attitudes against the death penalty. Faux juries in favour of the death penalty were far less likely to declare a defendant is not guilty by reason of insanity than mock juries opposed to the death penalty. They're also less likely to accept the prosecution's expert testimony and to believe that the defendant's mental illness played a role in the crime.

2.6 Criminal Behaviour

One of the most important factors that has to be taken into account is that most of the time, not every neurological or psychological disorder is a factor for the commission of a crime by an individual. The presence of the disorder could be completely unrelated to the actions of a criminal. Research shows that many criminals are intelligent and aware of the moral and legal ramifications of their conduct, yet they continue to commit crimes. Crime offenders consider the perceived advantages and disadvantages of their choices, even when engaging in unlawful activity according to the Rational Choice Theory (RCT). The RCT says that just as people voluntarily, knowingly choose to do other things, like work in a grocery store, attend college, or take recreational drugs, they also voluntarily, knowingly choose to commit crimes like assault, car theft, and burglary. According to this theory criminal acts are a product of choice, which means that people make decisions about whether they should commit the criminal act (Cornish, D. B., & Clarke, R. V. 1989). Many times, an individual's environment and upbringing plays a factor in committing a crime and they could just be a result of the situation they could be in.

Before committing a crime, an offender participates in some kind of cognitive processing, even if they might not always have perfect information or make perfectly rational conclusions. For example, people may consider subjective elements such as potential financial gain, arrest danger, and personal safety while determining whether to commit a crime or pursue a lawful alternative like earning a respectable job. These assessments influence them (Akers, R. L., 2017). This type of cognitive processing shows that there could be the presence of mens rea in the person committing the crime.

Studies on intentional criminal thinking demonstrates how certain individuals, particularly seasoned offenders, purposefully minimize the moral implications of their actions in order to maintain their illegal behavior without experiencing severe mental illnesses. These offenders usually put themselves away from responsibility and guilt, using cognitive techniques to downplay or justify their actions (Guan, X., & Lo, T. W., 2022). This indicates that people continue to perpetrate crimes by psychologically downplaying the seriousness or wrongness of their actions, without experiencing psychological anguish or regret.

Furthermore, studies look into the relevance of cognitive coping mechanisms that criminals employ to mitigate guilt-related emotions. The idea that many criminals are aware of the legality of their acts but decide to carry them out nonetheless because they believe they would benefit them personally is additionally backed by the possibility that these people will use justification strategies to help them defend their illegal behaviour (Walters, G. D., 2016). Emotional considerations influence how decisions are made. Even volatile criminals frequently weigh the pros and cons of their actions before perpetrating a crime, suggesting a rational thought process behind their actions (Benson, M. L., & Livelsberger, T., 2012). This

shows that most criminals are fully aware of their actions while committing a crime and have found ways to justify their crimes.

2.7 Neurolaw : Law and Neuroscience

The study of neurolaw is an interdisciplinary field that examines how legal norms and regulations are impacted by discoveries made in the neuroscience field.

Neurolaw is a newly growing field that is getting recognition very quickly. It has become a recognised field of study and since law requires to work with and within the human brain, therefore the efficacy of the law will rise with an improvement in its cognitive fit. This makes law and cognitive neuroscience innate partners (Goodenough et al, 2010). One article talks about neurolaw being a loose division of neuroethics. Concerning the usefulness and appropriateness of classifying them as separate branches of law and ethics, respectively, similar fundamental issues come up. A significant difference can be made in both cases between an investigation into the creation and application of brain science and technology and a self-reflexive investigation. These two types of research interact in fascinating ways in both domains. It addresses the neurolegal equivalents of the criticisms levelled at neuroethics and also proposes a conceptual framework for neurolaw (Chandler, J. A, 2018).

Advances in neuroimaging technology, such functional magnetic resonance imaging (fMRI), have accelerated the field by enabling scientists to examine anomalies and brain activity.

Whether people with specific neural conditions such as brain tumours, severe brain damage, or cognitive disorders should be held entirely accountable for their conduct is a central subject in the field of neurolaw. These situations may have an impact on moral reasoning, emotional control, and impulse control, all of which are important for determining guilt in criminal proceedings (Matsueda, R. L., 2013).

Discussions concerning determinism and free will have also been triggered by the incorporation of neuroscience into the legal system. Some contend that knowledge of the neurobiological foundations of conduct calls into question the conventional conception of free will, speculating that some behaviours might be motivated more by the chemistry and structure of the brain than by conscious decision. This has an impact on a sentence because, in cases when an offender's neurological condition profoundly impacts their conduct, judges may be required to take additional factors into account (Atiq, E. H., 2013).

Another study was conducted on the significance of the study of neuroscience on forensic psychiatry. It argued that neuroscience adapted to decision making in the criminal justice system could prove useful in forensic assessments and the research also provides a cognizance on the real impact on the decision making of defendants in the acts they are involved in (Meynen, G. 2013).

Neurolaw presents difficulties, mainly with regard to the reliability and comprehension of neuroscientific proof in court, even though it may have advantages such as more individualised and equitable sentencing. There are uncertainties surrounding brain scans and whether they can accurately predict future actions and ethical concerns concerning the confidentiality of neurological data. (Benson, M. L., & Livelsberger, T., 2012) (Matsueda, R. L., 2013).

Chapter 3- An Empirical Study: A Survey of Non-Experts' Attitudes

3.1 Research Design

Existing literature has established some key findings in this complex overlap of neurosciences, psychology, legal and judicial systems. This study aims to further explore the perception of the public towards the cases committed by neurologically and psychologically affected individuals and identify the potential behaviour of the juries towards the same. A neurological disorder is any disease that affects the brain, spinal cord and/or nerves. Since these are the systems that control our mind and body, these disorders can affect the way we think, interact and feel about the world. A neurological case is a criminal case where the individual accused of the crime has a neurological disorder. A psychological disorder is the clinical disruption in an individual's emotional and cognitive regulation, or behaviour. These are usually associated with distress or disability in the various areas of functioning. A psychological case is a criminal case wherein the person involved in the crime has a psychological disorder.

The aim of this research is to analyse the bias on the basis of specific characteristics, such as the "perception of criminality", for the individual who has committed the crime, that is, whether the perception of the participant is that the criminal act was committed by the person due to their mental disorder, without mens rea, or with mens rea. While previous research has already established this, I aim to explore if there is a difference in the perception of criminality for cases involving neurological disorder, when compared to psychological disorders. In order to test this, following hypothesis was formulated:

H_{0.1}: *There is no significant difference in the perception of criminality for Neurological and Psychological cases*

H_{1.1}: *There is a significant difference in the perception of criminality for Neurological and Psychological cases*

(1)

This hypothesis further explores the research conducted by Breheny et al. (2007), by particularly seeing the differences in the approach towards these two categories of the disorders.

Secondly, the research aims to explore the attitude and the perception of the participants towards the nature of the activity itself, whether a person was culpable for the act or not. Specifically, the level of confidence of the participant in determining the nature of the crime and culpability (whether it is a criminal offence). This reflects upon the subjective judgement of the participants towards the legal issues presented to them in the various cases. This is framed in a way so that the participant gives a response capturing their perception of responsibility for the acts committed by mentally challenged people as mentioned in the cases. In order to test this, the following hypothesis is framed:

H_{0.2}: *There is no significant difference in the perception of Culpability for Neurological and Psychological cases*

H_{1.2}: *There is a significant difference in the perception of Culpability for Neurological and Psychological cases*

(2)

This hypothesis aims to capture the subjective perception of the respondents towards the different acts committed by neurologically and psychologically disabled individuals. Thus, acting as a proxy variable to capture the bias between the two types of cases. The methodology of testing these hypotheses will be further explained in the methodology.

3.2 Methodology

3.2.1 Questionnaire Design

The current study aimed to examine the influence of the presence of a neurological or psychological disorder, in an individual involved in a criminal activity, on jury decision making. In order to test this, the appropriate method was to create a questionnaire and ask participants to answer a set of questions. The study was created using google forms. The questionnaire that was sent and the responses that were collected were all done online. The study was conducted on the general population. There were a total of 152 responses obtained over the span of 3 days and all the participants were above the age of 18. The data collected was primarily quantitative with the possibility of a qualitative analysis.

Demographic characteristics	Number of respondents	Percentage
Age		
18-22	12	7.9%
23-25	18	11.8%
26-30	9	5.9%
30 and above	113	74.3%
Gender		
Male	85	55.9%
Female	67	44.1%
Others	0	0%
Background in Psychology		
Yes	105	77.8%
No	30	22.2%
Occupation		
Student	26	17.1%

Working	83	28.3%
Others	43	54.6%

The research questionnaire has been structured into 3 main categories, firstly, the demographic analysis questions. These questions were drafted to collect the demographic data and variances of the respondents. It included multiple choice-based questions and consisted of demographic characteristics such as age group, gender, occupation and whether they have a background in psychology. In the second category, the participants read hypothetical cases in which individuals with a neurological or psychological disorder committed a crime. It was rated on a 5-point Likert Scale. They were presented with four cases, two with a neurological disorder and two with a psychological disorder. The first case presented was that of a lady with Alzheimer's Disease, the second case was that of a professor with brain tumour causing aggressive behaviour, the third case was of an individual with schizophrenia suffering from hallucinations and delusions, and the fourth case was of a war veteran suffering from Post Traumatic Stress Disorder. Five questions each were asked for the cases individually. The first question measured the perception of the nature of crime i.e how confident the respondents felt about their understanding of the crime. The second question assessed the attribution of responsibility which is whether the respondents believed that the neurological or psychological disorder is responsible for the crime. The third, fourth and fifth question measured the influence of the illness or disorder that is the extent to which people believed the disorder influenced the respective actions and that it should affect the sentencing and culpability.

The third category consisted of 10 general questions. These questions checked the perceived bias, which is whether the respondents believed that is a systematic bias against the people

with mental disorders in the judiciary system and whether changes were needed, and how respondents viewed the distinction in the treatment, authenticity and public perception of neurological vs psychological disorders in the judicial system.

3.2.2 Data Validation

Since the majority of the questions in the questionnaire had the responses collected on a 5-point likert scale. The responses had to be tested for internal consistency. In order to do this, a test using Cronbach's Alpha was run for the 20 questions based on the likert scale (20 questions for the cases, 5 each). The results obtained from the test were as follows:

Average interitem covariance:	0.2724384
Number of items in the scale:	20
Scale reliability coefficient:	0.7979

Table 1.1: *Cronbach's Alpha Test for Internal Consistency of Data*

The results indicate a moderate covariance of 0.272, which indicates that the items are reasonably correlated with each other, this is positive since the questions might have subjective answers. The scale reliability coefficient is 0.797, which is $0.7 < \alpha < 0.8$. This falls within the 'good' range, indicating that the data has good internal consistency and enabling us to use this data for further tests.

3.3 Empirical Methodology

All the data analysis for the purposes of this study has been done using STATA.

Hypothesis 1 (Criminality)

In order to test the first Hypothesis, the data analysis methodology has been described below.

Firstly, in order to capture the perception of criminality, the following question has been asked in each of the cases “*After reviewing the case, to what extent do you agree that you can determine the nature of the crime? (whether it is a criminal offence ?)*” (Q1.1, Q2.1, Q3.1, Q4.1). The answer to this question captures the perception of the participant towards the individuals mentioned in the cases and can be used as a proxy. Since the cases 1 and 2 had a subject with Neurological illnesses, the responses for the question had been transformed into a single data point using the following equation:

$$\textit{Criminality (Neurological Cases)} = (Q1.1 + Q2.1)/2$$

Equation (1)

This averages the scores for the neurological cases, since the likert scale had 5 points. This reduces the overall noise in the data and provides more consistency by reflecting on the overall attitude of the participants on the basis of their responses. The same was done for cases with Psychological disorders using the following equation:

$$\textit{Criminality (Psychological Cases)} = (Q3.1 + Q4.1)/2$$

Equation (2)

After this transformation of data, a paired T-test was run in order to compare the means of the two, (All questions answered by the same participants), in order to test for the presence of any significant difference, which will be further discussed in the results section. These results were then compared with the responses of the questions of section 3, which included open questions in order to explore the potential justifications for the results.

Following this, a linear regression analysis was carried out using a new variable which captured the difference in the values between Equation 1 and Equation 2 along with the Demographic variables as independent variables in order to analyse what could be the

possible sources of the bias on the basis of the demographic characteristics of the participants. This was done as follows:

$$\text{Difference} = \text{Criminality (Neurological Cases)} - \text{Criminality (Psychological Cases)}$$

Equation (3)

Using this difference variable, the following regression analysis was carried out:

$$Y (\text{Difference of Criminality}) = \beta_1 + \beta_2 \times \text{Age} + \beta_3 \times \text{Gender} + \beta_4 \times \text{Occupation} + \beta_5 \times \text{Background in Psychology} + \varepsilon$$

Regression Model (4)

Hypothesis 2

In order to test for the perception of culpability in the cases, the similar method such as the one in Hypothesis 1 was used by analysing the responses given by the participants for the question “*To what extent do you agree that the person is responsible for the crime over their mental illness?*” (Q1.2, Q2.2, Q3.2, Q4.2). This was then paired into single variables as done for Hypothesis 1, using the following Equations:

$$\text{Culpability (Neurological Cases)} = (Q1.2 + Q2.2)/2$$

Equation (5)

Similarly, for the Psychological cases:

$$\text{Culpability (Psychological Cases)} = (Q3.2 + Q4.2)/2$$

Equation (5)

These variables were then analysed through a paired T-test in order to determine the presence of any significant differences between Neurological and Psychological cases, which will be further discussed in the Results section.

3.4 Ethical Considerations

Participants were informed about the study's purpose and gave voluntary consent to participate. The responses are anonymous and confidential to protect their privacy, especially given the sensitive nature of mental health discussions.

3.5 Results

3.5.1 Hypothesis 1 (Perception of Criminality)

Upon running the paired T-test for hypothesis 1, the following results were obtained:

Variable	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
CriminalityNeuro	152	2.2763	0.0933	1.1506	2.0919	2.4607
CriminalityPsycho	152	2.6513	0.0930	1.1466	2.4676	2.8351
diff	152	-0.3750	0.0802	0.9888	-0.5335	-0.2165

mean(diff) = mean(CriminalityNeuro - CriminalityPsycho) t = -4.6759

H0: mean(diff) = 0 Degrees of freedom = 151

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Table 1.2: Paired T-Test Results for perception of Criminality

These paired T-test results indicate that the perception of criminality by the participants for the Neurological cases significantly differs from the perception for the psychological cases, which is indicated by the t-value of -4.675 and a two-tailed p-value of 0. The Neurological cases on average received a lower score when compared to psychological cases, with a difference of about 0.375 (not a large value considering that there are 5 points on the likert scale). Nonetheless, the difference is significant and thereby we can reject the null hypothesis and accept the alternate hypothesis.

Regression Analysis of Difference in Hypothesis 1

Upon running the regression analysis for the difference in criminality for neurological and psychological cases, the following results were obtained:

<u>Independent Variables</u>	<u>Regression Results</u>
Age of Participant	-0.0435 (0.0876)
Gender	0.311* (0.172)
Occupation	-0.170* (0.0927)
Background in Psychology	0.427** (0.191)
Region	0.316 (0.271)
Constant	-1.232** (0.621)
Observations	152
R-squared	0.078

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 1.3: *Regression results of Difference with Demographic variables*

This regression analysis of the difference between the perception of criminality for Neurological and Psychological cases with demographic factors of the participants as independent variables establishes that there was a significant effect of the Background in Psychology of the participants, which was a binary variable (Yes/No question, i.e 0 or 1), with a p-value < 0.05 . This indicates that participants with knowledge about psychology potentially display a bias. Furthermore, both the gender and occupation of the participants have a p-value < 0.1 , indicating the influence of these factors as well. Despite the significance of these results the R-squared value of this regression model is 0.078, which doesn't indicate a very good fit to the model.

3.5.2 Hypothesis 2 (Perception of Culpability)

Upon running the paired T-test for hypothesis 2, the following results were obtained:

Variable	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
CulpabilityNeuro	152	2.1184	0.0824	1.0160	1.9556	2.2812
CulpabilityPsych	152	2.7171	0.0917	1.1301	2.5360	2.8982
diff	152	-0.5987	0.0857	1.0564	-0.7680	-0.4294

$$\text{mean(diff)} = \text{mean}(\text{CriminalityNeuro} - \text{CriminalityPsych}) \quad t = -6.9869$$

$$H_0: \text{mean(diff)} = 0 \quad \text{Degrees of freedom} = 151$$

$$H_a: \text{mean(diff)} < 0 \quad H_a: \text{mean(diff)} \neq 0 \quad H_a: \text{mean(diff)} > 0$$

$$\Pr(T < t) = 0.0000 \quad \Pr(|T| > |t|) = 0.0000 \quad \Pr(T > t) = 1.0000$$

Table 2.1: Paired T-Test Results for perception of Culpability

Similar to the paired T-test for hypothesis 1, this T-test for the perception of culpability show that there is a significant difference between the perception of culpability for neurological cases when compared to psychological cases. On average, the perception of culpability for Psychological cases is higher when compared to neurological cases, by a margin of 0.598. This is statistically significant due to the t-value being -6.98 and the p-value for both the one-tailed and two-tailed tests is $0 > 0.05$. These results are statistically significant and thereby we can reject the null hypothesis and accept the alternative hypothesis that there is a significant difference.

These results go hand in hand with the responses of the participants in section 3, when asked, “Q7. In your opinion, are there significant differences in the treatment of cases involving neurological versus psychological disorders?”. The mean of the values was 3.605, indicating that the majority of the people found there is a difference in the treatment of these cases on the basis of the illness. Similar results were obtained for question 8, which stated that “Q8. To what extent do you think neurological disorders are considered more legitimate than psychological disorders in criminal cases”, and the average value of the responses was 3.375 (1=Not at all and 5= greatly). Thus indicating that the participants do perceive that there is a question of legitimacy for the cases with psychological illnesses. In Q9, the participants

responded that there should be a difference in sentencing considerations for different sets of disorders too, thus indicating that the participants clearly perceive there is a difference between the two types of disorders and indicating a bias.

3.6 Interpretation

The research indicates noteworthy patterns in participants' opinions regarding the criminal responsibility of individuals suffering from neurological and psychiatric disorders. One notable finding is the variation in prejudice towards different types and degrees of illness. "Bias" here refers to the tendency of respondents to minimize the degree to which mental health disorders—particularly severe neurological or psychiatric conditions—affect a defendant's capacity for understanding or controlling their behavior, hence impacting the defendant's guilt for criminal charges. Regarding criminality and culpability, answers for both neurological and psychological issues differed. Culpability is the blame or responsibility an individual takes for a fault. Criminality is the act that goes against the criminal law.

Age did not have any influence. There was a slight influence found of gender in the perception of criminality and respondents with a background in psychology had a significant influence on the perception of criminality which indicates that awareness regarding the disorders affects the perception regarding criminality of the act and the culpability.

There was a significant difference in the way the respondents perceived neurological and psychological disorders. The bias was more towards psychological disorders. Bias is generally the inclination towards or against a factor or group etc. Respondents were more affected in the culpability of psychological disorders as compared to the neurological

disorders which means that the respondents perceived individuals having psychological disorders to be less at fault for the crime as compared to individuals having neurological disorders. This is because the perception of the judicial system in determining guilt towards individuals with neurological disorders is more tricky (Slovenko, R. 1995).

But there was also a significant difference in the perception of the crime i.e. whether it was a criminal offence, seen in Questions 1.1, 2.1, 3.1, 4.1. Neurological disorders had a lower score than psychological disorders which means that a higher number of people thought that crimes committed by individuals having neurological disorders weren't a criminal offence as compared to crimes committed by individuals having psychological disorders. A similar significant difference was found in the criminality i.e. the responsibility of the crime over the illness as seen in Questions 1.2, 2.2, 3.2, 4.2. Neurological disorders had a lower score as compared to psychological disorders which means that more respondents thought that individuals having neurological disorders had a lesser criminal responsibility in comparison to individuals having psychological disorders. This is because it is shown that an individual's biology has an influence on criminality (Glenn et al, 2014) and that there is a relation between biological functioning and anti-social behaviour (Raine et al, 2013).

The study highlights the lack of awareness regarding mental health conditions and their impact on behavior. Despite acknowledging that pathologies impair a defendant's influence over their behavior, individuals may however demand some culpability, especially for less serious conditions. This could be an indication of the belief that, while mental health problems are significant, they shouldn't be the whole basis for criminal behavior; rather, they should be one factor to be taken into account when determining guilt.

This reading does not definitively state that those with mental illnesses should be cleared of criminal guilt.

3.7 Implications

While awareness on neurological and psychological disorders are gaining momentum, there is still a stigma and bias in opinion regarding them. The stigma also extends to the legal and judicial system. According to the study mentioned, crimes committed by individuals with a neurological or psychological disorder have a skewed perception in the judicial system as judges find it demanding to determine the unlawfulness of the act (Slovenko, R. 1995). This can lead to inconsistent or biased rulings in cases involving mental health disorders. To understand better the potential biases and misconceptions, a more in depth study on jury perspective regarding these disorders is necessary.

The perspective between peoples opinions on neurological and psychological disorders varies greatly in the public. The findings of the T- Test analysis presented in the study highlight significant differences in the way crimes committed by individuals with neurological disorders are perceived as compared to those with psychological disorders. Results indicate that there is a great bias against individuals with psychological disorders in regard to culpability. This suggests that people may be more inclined to believe that individuals with psychological disorders are more responsible for their actions as compared to individuals with neurological disorders in regards to criminal offence and criminal responsibility. But advancement in these two areas are growing with an increase in the discovery of information and awareness (Goodenough, O. R., & Tucker, M., 2010).

The judiciary system is conflicted between the crimes committed by individuals with neurological disorders and psychological disorders. The act of committing a crime is never acceptable and hence the jury has to be immensely well versed and careful with passing of the verdict in cases where the offender has a disorder as it can lead to partiality or unfair

decision making. While knowledge about psychological disorders have gained momentum, neurological disorders are still on the path of getting the same recognition. The severity of the disorder also has an impact on the judicial decision making i.e. defendants with milder disorders were said to be guilty as compared to a defendant with a more serious disorder. It causes a negligible difference in the verdict, sentence, penalty etc (Garrison Sydney, 2021).

Results may be even more significant if the study's demographic sample was made more diverse. A more realistic picture of societal prejudices toward neurological and psychological diseases could be obtained by researchers by incorporating participants with a wider variety of ages, gender identities, professions, and educational levels etc. This would improve our comprehension of the elements that lead to judicial bias in situations involving mental health disorders in addition to supporting the study's findings. In order to lessen the stigma attached to mental health illnesses, such study would be extremely helpful in creating future legislation, jury and judge training programs, and public awareness campaigns.

3.8 Limitations and Recommendations

Respondents may give answers they feel are socially acceptable i.e. social desirability bias, therefore the responses may not accurately reflect the jury's real decision-making. One possible avenue for bias in the study is the employment of specific phrases that evoke strong emotions, such as "guilt," "crime," and "culpability." Due to the strong connotations associated with these words, respondents may be greatly influenced in their judgments, forming opinions based on preconceived assumptions about criminal behaviour or traditional expectations.

The lack of a control variable in the study is one obvious drawback. To be more precise, it is challenging to evaluate how disorders themselves affect criminality and responsibility judgments because there isn't a neutral scenario involving a person who has no problems (psychological or neurological). Finding out if the bias is indeed caused by the existence of a condition or if other factors, including the type of crime, are more important, is difficult without a baseline comparison.

The restricted sample size, with respect to geographic variety and respondent origins, is another significant limitation. Few people from various nations are included in the study, which limits how broadly the results may be applied. Knowledge of these biases that is more thorough would be provided by a more varied group of respondents. There is also a significant absence of people with a background in psychology. A more comprehensive understanding of neurological and psychological diseases and potentially less prejudice in judgments are traits shared by those with psychological experiences. It would help to balance the sample and offer more knowledgeable viewpoints on the topics if there were a greater proportion of respondents having these backgrounds.

One other drawback is that the participants in this research were not real judges; rather, they served as a proxy jury. Professionals with legal training may have very different decision-making processes than laypeople. Particularly in cases involving mental health conditions, juries and judges with legal experience are likely to evaluate criminal guilt in a more systematic manner. By using a proxy jury, it is possible that the way verdicts are simulated will contain errors due to participants' lack of understanding of the legal complexity and standards of proof that are necessary in real courtroom contexts. Since this is a pilot study, subsequent research endeavours may tackle this matter by incorporating legal experts or, at

the very least, offering participants more comprehensive instruction or protocols, enabling them to gain a better understanding of their decision-making responsibilities.

Finally, without examining more intricate linkages within the data, the current study primarily compares the means of the two groups, those with neurological diseases and those with psychological disorders. Averages can give a broad picture of differences, but they don't account for the subtle elements that could be skewing impressions.

Chapter- 4 Conclusion

This study highlights the challenges judges face when making decisions when mental health illnesses are present by showing significant prejudices in the perception of neurological and psychological conditions in relation to criminal culpability. Respondents typically perceived those with psychological diseases as having greater responsibility than those with neurological conditions, which may indicate that individuals are not fully aware of the impact that psychological disorders can have on conduct and judgment. The findings show that while attitudes around mental health problems are growing in the public and judicial domains, there is still a gap between what is known scientifically about these conditions' effects on an individual's capacity for autonomy and culpability.

The study also emphasizes the need for increased knowledge and understanding in legal contexts, especially with regard to the disparate impacts of neurological and psychological diseases. Rather than depending on stereotypes or stigmatized viewpoints, judicial systems ought to make an effort to make more complex decisions that take into account the complexity of mental health. Potential solutions to address the biases shown in this study

include involving mental health practitioners in legal procedures and developing more precise rules for determining how these diseases impact criminal behavior.

Ultimately, while this study provides useful data on public opinion, it also highlights the need for more research including judges and individuals from the judicial system and a larger variety of demographic groups. Eventually, the goal should be to ensure that individuals with mental health disorders receive appropriate and equitable treatment within the legal system, while simultaneously considering the ways in which their condition may impact their behavior and the needs of public safety and the law.

Bibliography

Akers, R. L. (2017). Rational Choice, Deterrence, and Social Learning Theory in

Criminology: The Path Not Taken*. In Routledge eBooks (pp. 299–322).

<https://doi.org/10.4324/9781315095301-14>

APA PsycNet. (n.d.). <https://psycnet.apa.org/record/2013-09813-000>

Atiq, E. H. (2013). How Folk Beliefs about Free Will Influence Sentencing. *New Criminal Law Review*, 16(3), 449–493. <https://doi.org/10.1525/nclr.2013.16.3.449>

Benson, M. L., & Livelsberger, T. (2012). Emotions, Choice, and Crime. In Oxford University Press eBooks (pp. 494–510).

<https://doi.org/10.1093/oxfordhb/9780199747238.013.0026>

Bloechl, A. L., Vitacco, M. J., Neumann, C. S., & Erickson, S. E. (2007). An empirical investigation of insanity defense attitudes: Exploring factors related to bias. *International Journal of Law and Psychiatry*, 30(2), 153–161. <https://doi.org/10.1016/j.ijlp.2006.03.007>

Breheney, C., Groscup, J., & Galietta, M. (2007). Gender matters in the insanity defense. *Law & Psychol. Rev.*, 31, 93.

Chandler, J. A. (2018). Neurolaw and Neuroethics. *Cambridge Quarterly of Healthcare Ethics*, 27(4), 590–598. <https://doi.org/10.1017/s0963180118000117>

Cipriani, G., Lucetti, C., Danti, S., Carlesi, C., & Nuti, A. (2015). Violent and criminal manifestations in dementia patients. *Geriatrics and Gerontology International/Geriatrics & Gerontology International*, 16(5), 541–549. <https://doi.org/10.1111/ggi.12608>

Cornish, D. B., & Clarke, R. V. (1989). Crime Specialisation, Crime Displacement and Rational Choice Theory. In *Research in criminology* (pp. 103–117).

https://doi.org/10.1007/978-3-642-86017-1_7

Curley, L. J., Munro, J., & Dror, I. E. (2022). Cognitive and human factors in legal layperson decision making: Sources of bias in juror decision making. *Medicine Science and the Law*, 62(3), 206–215. <https://doi.org/10.1177/00258024221080655>

Cutler, B. L., Moran, G., & Narby, D. J. (1992). Jury selection in insanity defense cases. *Journal of Research in Personality*, 26(2), 165–182. [https://doi.org/10.1016/0092-6566\(92\)90052-6](https://doi.org/10.1016/0092-6566(92)90052-6)

Darby, R. R., Horn, A., Cushman, F., & Fox, M. D. (2017). Lesion network localization of criminal behavior. *Proceedings of the National Academy of Sciences*, 115(3), 601–606. <https://doi.org/10.1073/pnas.1706587115>

De Kogel, C. (1998). R. Slovenko, *Psychiatry and Criminal Culpability*, (New York: John Wiley & Sons Inc., 1995, 436 pp.). *European Journal of Crime Criminal Law and Criminal Justice*, 6(3), 304–307. <https://doi.org/10.1163/15718179820518458>

Dufner, A. (2012). Should the Late Stage Demented be Punished for Past Crimes? *Criminal Law and Philosophy*, 7(1), 137–150. <https://doi.org/10.1007/s11572-012-9194-5>

Fabian, J. M. (2010). Neuropsychological and neurological correlates in violent and homicidal offenders: A legal and neuroscience perspective. *Aggression and Violent Behavior*, 15(3), 209–223. <https://doi.org/10.1016/j.avb.2009.12.004>

Freckelton, I. (2022, June 1). PARKINSON'S DISEASE AND THE CRIMINAL JUSTICE SYSTEM. | *Journal of Law & Medicine* | EBSCOhost.
<https://openurl.ebsco.com/EPDB%3Agcd%3A5%3A6805829/detailv2?sid=ebsco%3Aplink%3Ascholar&id=ebsco%3Agcd%3A161464286&crf=c>

Garrison, S. (n.d.). Stigma and Juror Bias Toward Mentally Ill Defendants. TopSCHOLAR®.
<https://digitalcommons.wku.edu/theses/3516/>

Gkotsi, G. M., Gasser, J., & Moulin, V. (2019). Neuroimaging in criminal trials and the role of psychiatrists expert witnesses: A case study. *International Journal of Law and Psychiatry*, 65, 101359. <https://doi.org/10.1016/j.ijlp.2018.05.007>

Glenn, A. L., & Raine, A. (2013). Neurocriminology: implications for the punishment, prediction and prevention of criminal behaviour. *Nature Reviews. Neuroscience*, 15(1), 54–63. <https://doi.org/10.1038/nrn3640>

Goodenough, O. R., & Tucker, M. (2010). Law and Cognitive Neuroscience. *Annual Review of Law and Social Science*, 6(1), 61–92.

<https://doi.org/10.1146/annurev.lawsocsci.093008.131523>

Grafman, J., Schwab, K., Warden, D., Pridgen, A., Brown, H. R., & Salazar, A. M. (1996). Frontal lobe injuries, violence, and aggression. *Neurology*, 46(5), 1231.

<https://doi.org/10.1212/wnl.46.5.1231>

Guan, X., & Lo, T. W. (2022). Proactive Criminal Thinking and Restrictive Deterrence: A Pathway to Future Offending and Sanction Avoidance. *International Journal of Environmental Research and Public Health*, 19(18), 11636.

<https://doi.org/10.3390/ijerph191811636>

Hutton, S., Murphy, F., Joyce, E., Rogers, R., Cuthbert, I., Barnes, T., McKenna, P., Sahakian, B., & Robbins, T. (2002). Decision making deficits in patients with first-episode and chronic schizophrenia. *Schizophrenia Research*, 55(3), 249–257.

[https://doi.org/10.1016/s0920-9964\(01\)00216-x](https://doi.org/10.1016/s0920-9964(01)00216-x)

LaDuke, C., Locklair, B., & Heilbrun, K. (2018). Neuroscientific, Neuropsychological, and Psychological Evidence Comparably Impact Legal Decision Making: Implications for Experts and Legal Practitioners. *Journal of Forensic Psychology Research and Practice*, 18(2), 114–142. <https://doi.org/10.1080/24732850.2018.1439142>

Liljegren, M., Naasan, G., Temlett, J., Perry, D. C., Rankin, K. P., Merrilees, J., Grinberg, L. T., Seeley, W. W., Englund, E., & Miller, B. L. (2015). Criminal Behavior in Frontotemporal

Dementia and Alzheimer Disease. *JAMA Neurology*, 72(3), 295.

<https://doi.org/10.1001/jamaneurol.2014.3781>

Martens, W. H. J. (2002). Criminality and Moral Dysfunctions: Neurological, Biochemical, and Genetic Dimensions. *International Journal of Offender Therapy and Comparative Criminology*, 46(2), 170–182. <https://doi.org/10.1177/0306624x02462004>

Matsueda, R. L. (n.d.). RATIONAL CHOICE RESEARCH IN CRIMINOLOGY: A MULTI-LEVEL FRAMEWORK. In CHAPTER 8.

<http://faculty.washington.edu/matsueda/Papers/Rational%20Choice%20Final.pdf>

Mendez, M. F. (2010). The Unique Predisposition to Criminal Violations in Frontotemporal Dementia. PubMed Central (PMC).

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3139561/>

Meynen, G. (2013). A neurolaw perspective on psychiatric assessments of criminal responsibility: Decision-making, mental disorder, and the brain. *International Journal of Law and Psychiatry*, 36(2), 93–99. <https://doi.org/10.1016/j.ijlp.2013.01.001>

Miller, B. L. (n.d.). Aggressive, socially disruptive and antisocial behaviour associated with fronto-temporal dementia - ProQuest.

<https://www.proquest.com/openview/ddb25cd0163efea96296e356a664f912/1?pq-origsite=gscholar&cbl=40635>

Moberg, T., Stenbacka, M., Tengström, A., Jönsson, E. G., Nordström, P., & Jokinen, J. (2015). Psychiatric and neurological disorders in late adolescence and risk of convictions for violent crime in men. *BMC Psychiatry*, 15(1). <https://doi.org/10.1186/s12888-015-0683-7>

Mossière, A., & Maeder, E. M. (2015). Defendant mental illness and juror decision-making: A comparison of sample types. *International Journal of Law and Psychiatry*, 42–43, 58–66. <https://doi.org/10.1016/j.ijlp.2015.08.008>

Mossière, A., & Maeder, E. M. (2016). Juror decision making in not criminally responsible on account of mental disorder trials: Effects of defendant gender and mental illness type. *International Journal of Law and Psychiatry*, 49, 47–54. <https://doi.org/10.1016/j.ijlp.2016.05.008>

Mullen, P. E. (2006). Schizophrenia and violence: from correlations to preventive strategies. *Advances in Psychiatric Treatment*, 12(4), 239–248. <https://doi.org/10.1192/apt.12.4.239>

Nabizadeh, F., & Aarabi, M. H. (2023). Functional and structural lesion network mapping in neurological and psychiatric disorders: a systematic review. *Frontiers in Neurology*, 14. <https://doi.org/10.3389/fneur.2023.1100067>

Navarrete, V. (2011). HART, H. L. A., *Punishment and Responsibility*. Essays in the Philosophy of Law, 2a. ed., Oxford, Oxford University Press, 2008, liii, 277. *Problema Anuario De Filosofía Y Teoría Del Derecho*, 1(5). <https://doi.org/10.22201/ijj.24487937e.2011.5.8124>

Poulson, R. L., Wuensch, K. L., Brown, M. B., & Braithwaite, R. L. (1997, December 1).

Mock Juror's Evaluations of Insanity Defense Verdict Selection: The Role of Death Penalty Attitudes. | Journal of Social Behavior & Personality | EBSCOhost.

<https://openurl.ebsco.com/EPDB%3Agcd%3A2%3A12121954/detailv2?sid=ebsco%3Aplink%3Ascholar&id=ebsco%3Agcd%3A185178&crl=c>

Raine, A. (2014). *The anatomy of violence: The biological roots of crime*. In Vintage. Vintage.

Sariaslan, A., Lichtenstein, P., Larsson, H., & Fazel, S. (2016). Triggers for Violent Criminality in Patients With Psychotic Disorders. *JAMA Psychiatry*, 73(8), 796.

<https://doi.org/10.1001/jamapsychiatry.2016.1349>

Schofield, P. W., Malacova, E., Preen, D. B., D'Este, C., Tate, R., Reekie, J., Wand, H., & Butler, T. (2015). Does Traumatic Brain Injury Lead to Criminality? A Whole-Population Retrospective Cohort Study Using Linked Data. *PLoS ONE*, 10(7), e0132558.

<https://doi.org/10.1371/journal.pone.0132558>

Sfera, A., Osorio, C., Gradini, R., & Price, A. (2014). Neurodegeneration Behind Bars: from Molecules to Jurisprudence. *Frontiers in Psychiatry*, 5.

<https://doi.org/10.3389/fpsy.2014.00115>

Singh, J. P., Grann, M., Lichtenstein, P., Långström, N., & Fazel, S. (2012). A Novel Approach to Determining Violence Risk in Schizophrenia: Developing a Stepped Strategy in

13,806 Discharged Patients. PLoS ONE, 7(2), e31727.

<https://doi.org/10.1371/journal.pone.0031727>

Skeem, J. L. (n.d.). Understanding juror decision making and bias in insanity defense cases: The role of lay conceptions and case -relevant attitudes - ProQuest.

<https://www.proquest.com/openview/ed16b6f2a79c5b12ffecfb3d83ab326a/1?pq-origsite=gscholar&cbl=18750&diss=y>

Tsimploulis, G., Niveau, G., Eytan, A., Giannakopoulos, P., & Sentissi, O. (2018).

Schizophrenia and Criminal Responsibility. *The Journal of Nervous and Mental Disease*, 206(5), 370–377. <https://doi.org/10.1097/nmd.0000000000000805>

Tuvblad, C., Gao, Y., Wang, P., Raine, A., Botwick, T., & Baker, L. A. (2012). The genetic and environmental etiology of decision-making: A longitudinal twin study. *Journal of Adolescence*, 36(2), 245–255. <https://doi.org/10.1016/j.adolescence.2012.10.006>

Van Es, R., Kunst, M., & De Keijser, J. (2020). Forensic mental health expert testimony and judicial decision-making: A systematic literature review. *Aggression and Violent Behavior*, 51, 101387. <https://doi.org/10.1016/j.avb.2020.101387>

Walters, G. D. (2016). Decision to commit crime: rational or nonrational. *Actual Problems of Economics and Law*, 10(3). <https://doi.org/10.21202/1993-047x.10.2016.3.252-270>

Yang, Y., & Raine, A. (2009). Prefrontal structural and functional brain imaging findings in antisocial, violent, and psychopathic individuals: A meta-analysis. *Psychiatry Research Neuroimaging*, 174(2), 81–88. <https://doi.org/10.1016/j.psychresns.2009.03.012>

Zeki, S., Goodenough, O. R., Greene, J., & Cohen, J. (2004). For the law, neuroscience changes nothing and everything. *Philosophical Transactions of the Royal Society B Biological Sciences*, 359(1451), 1775–1785. <https://doi.org/10.1098/rstb.2004.1546>

Annexure

Questionnaire

Section -1

1. Age

- 18-22
- 23-25
- 26-30
- 30 and above

2. Gender

- Female
- Male
- Others

3. Nationality

4. Background in psychology

- Yes
- No

5. Occupation

- Student
- Working
- Others

Section-2

Please read the cases and answer the following questions keeping in mind that you are a judge or member of the jury.

Case 1

An elderly woman was diagnosed with Alzheimer's Disease. Despite being under the care of her family, she often suffered from memory lapses, a common symptom of her condition. One unfortunate day, due to a significant lapse in memory, she forgot to turn off the stove after cooking, leading to a fire in her kitchen. A family member who attempted to extinguish the fire suffered burns and required hospitalisation. This incident led to criminal proceedings.

1.1 After reviewing the case, to what extent do you agree that you can determine the nature of the crime? (whether it is a criminal offence ?)

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

1.2 To what extent do you agree that the person is responsible for the crime over their mental illness?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

1.3 Do you agree that the defendant's mental illness influenced their actions during the crime?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

1.4 Does the defendant's mental illness affect your perception of their culpability?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

1.5 To what extent should the defendant's mental illness be considered during sentencing?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

Case 2

A professor known for his composed demeanor and with no previous history of criminality or public nuisance suddenly started showing signs of aggression. On a quiet evening around 9 PM, he assaulted a pedestrian waiting for the bus, an act entirely misaligned with his usual character. Following this alarming event, he was arrested and charged with assault. During his medical examination, a tumor was found in his frontal lobe, a part of the brain that regulates personality and behavioral control.

2.1 After reviewing the case, to what extent do you agree that you can determine the nature of the crime? (whether it is a criminal offence ?)

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

2.2 To what extent do you agree that the person is responsible for the crime over their mental illness?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

2.3 Do you agree that the defendant's mental illness influenced their actions during the crime?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

2.4 Does the defendant's mental illness affect your perception of their culpability?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

2.5 To what extent should the defendant's mental illness be considered during sentencing?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

Case 3

A patient in his early 20s was diagnosed with schizophrenia . Despite undergoing therapy, the patient often suffered from hallucinations and delusions that distorted his reality. The patient was usually stable and did not resort to violence, but one day, under the influence of a potent delusion, he attacked a stranger at a local grocery store, believing him to be a malevolent figure from his hallucinations. He was arrested and charged with assault.

3.1 After reviewing the case, to what extent do you agree that you can determine the nature of the crime? (whether it is a criminal offence ?)

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

3.2 To what extent do you agree that the person is responsible for the crime over their mental illness?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

3.3 Do you agree that the defendant's mental illness influenced their actions during the crime?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

3.4 Does the defendant's mental illness affect your perception of their culpability?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

3.5 To what extent should the defendant's mental illness be considered during sentencing?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

Case 4

A war veteran found himself in a controversial situation. Despite his heroic status during his military service, he was plagued by recurring flashbacks and nightmares of his experiences in combat. One afternoon, during an intense flashback, he attacked his neighbour while watering plants, mistakenly identifying him as an enemy soldier. He was arrested on grounds for assault.

4.1 After reviewing the case, to what extent do you agree that you can determine the nature of the crime? (whether it is a criminal offence ?)

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

4.2 To what extent do you agree that the person is responsible for the crime over their mental illness?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

4.3 Do you agree that the defendant's mental illness influenced their actions during the crime?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

4.4 Does the defendant's mental illness affect your perception of their culpability?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

4.5 To what extent should the defendant's mental illness be considered during sentencing?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

Section- 3

General Questions

1. If you were a judge/jury member to what extent do you think the defendant's disorder would influence your decision on the nature of their guilt?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

2. As a jury member, how much would the defendant's disorder affect your decision on the appropriate punishment?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

3. How difficult do you believe it would be to separate your personal feelings about mental disorders from your role as a jury member?

1. Not Difficult 2. Slightly Difficult 3. Moderately Difficult 4. Very Difficult

5. Extremely Difficult

4. Do you think the severity of the disorder should affect the severity of the punishment in a criminal case?

1.Should not affect at all 2. Should slightly affect 3.Should moderately affect 4.Should affect 5.Should greatly affect

5. Do you think there is a general bias in the criminal justice system towards people with mental illnesses?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

6. To what extent do you agree that changes are needed to improve the fairness of sentencing for defendants with mental illnesses?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

7. In your opinion, are there significant differences in the treatment of cases involving neurological versus psychological disorders?

1.No difference 2.Slight Difference 3.Moderate Difference 4.Considerable Difference 5.Significant Difference

8. To what extent do you think neurological disorders are considered more legitimate than psychological disorders in criminal cases?

1. Not at all 2. Slightly 3. Moderately 4. Very 5. Greatly

9. Do you believe that sentencing considerations should differ between cases involving neurological versus psychological disorders?

1.Should not differ at all 2. Should slightly differ 3.Should moderately differ 4.Should differ 5.Should greatly differ

10. To what degree do you think the public perception of neurological disorders versus psychological disorders influences the criminal justice system?

1.No influence 2.Slight influence 3.Moderate influence 4.Considerable influence
5.Significant influence

STATA Code

```
gen CriminalityNeuro = (v9 + v14)/2
```

```
gen CriminalityPsycho = (v19 + v24)/2
```

```
tttest CriminalityNeuro == CriminalityPsycho
```

```
generate diffO = CriminalityNeuro - CriminalityPsycho
```

```
regress diffO age_num gender_num occupation_num PsychLevel region_num
```

```
gen CulpabilityNeuro = (v10+v15)/2
```

```
gen CulpabilityPsych = (v20+v25)/2
```

```
tttest CulpabilityNeuro == CulpabilityPsych
```