

## “NEUROSCIENTIFIC EVIDENCE IN THE CRIMINAL TRIALS: MAPPING THE OTHER SIDE OF COURTROOM PROCEEDINGS”

---

Ritika Srivastava\*

### ABSTRACT

*Neuroscience has been used in courtroom proceedings since the turn of the 20th century. However, during the past 20 years, there has been substantial growth in the inclusion of neuroscientific evidence during criminal trials. media outlets, along with those in the legal or scientific sectors, have voiced concerns about this sudden surge over the potential impact that such evidence may have on judges or juries or on a whole legal system. In addition to the more conventional investigative techniques and devices, neuroscience has been around for a while. The biggest advancement that neuroscience has provided so far lies within the area of lunacy; it also serves as a tool for the restitution of the facts, evidence, judgment and, in a more particular sense, it is used for the confirmation of the legitimacy of statements made by witnesses or defendants throughout the course of the trial. In this study, we begin by providing an overview of the neuroscientific evidence preceding reviewing current research analysing the impacts of neuroscientific evidence on decision-making generally and on legal judgements specifically. This research analyses the impact of neuroscientific data (both imaging and non-imaging) on the legal decisions, suggested sentences, and opinions of mock jurors and judges who are presented with a criminal proceeding. In general, the research demonstrates that the use of neuroscientific data can influence court judgements, such as those involving the death penalty, and other punishments generally granted by the judicial system. Besides that, it also focuses on the factors like any mental disease diagnoses and perceived hazards which might temperate the minimising impact of such evidence.*

**Keywords:** Neuroscience, Neuroscientific Evidence, Criminal Trials, Proceedings, Brain, Legal System.

### OBJECTIVE

The research paper aims to provide information regarding the use of neuroscientific evidences in criminal trials as well as its impact on decision making, judges, juries, and the

---

\*BA LLB, FIRST YEAR, SYMBIOSIS LAW SCHOOL, HYDERABAD.

legal system as a whole. It is bent towards the use and impact of neuroscientific evidence in India. This research aims at disclosing the actual facts related to the neuroscientific evidence in India in addition to the opinions of the researcher on certain research questions related to this very research including, inter alia,

1. What is 'Neuroscience' and 'Neuroscientific evidences'?
2. The extent of use of 'neuroscientific evidences' in the criminal trials?
3. Whether the use of 'neuroscientific evidences' fulfilled its purpose in the Indian legal system?
4. What are the impacts of using 'neuroscientific evidences' in the criminal trials?
5. What are the consequences of using 'neuroscience' as well as 'neuroscientific evidences' in the legal system?

## **HYPOTHESIS**

This research has formulated the following hypothesis which are tested in this research paper.

This research seeks to fill a knowledge gap in the use of neuroscience or neuroscientific evidence when conducting criminal trials as well as within the legal system. By making an effort to gauge the degree to which persons prosecuted with criminal offences in India are depending on neuroscientific evidence in court. This research will demonstrate not only how widely it is used but also demonstrates that how well those who use arguments based on neuroscientific data succeed in establishing their argument. This research assesses the application of neuroscientific evidence in a country like India. It is to be seen in Indian courts where defendants are convicted of crimes and they use neuroscientific evidence as proper evidence within the court of law. The application of neuroscientific evidence in court has received a lot of attention over the past few years. In essence, this research examines the viability of introducing neuroscientific evidence in court.

## **RESEARCH METHODOLOGY**

This research has adopted Non-Doctrinal Research Methodology as well as Analytical Research Methodology which analyses the research using sources and with referring sources, provided an in-depth analysis of this research topic which will give the readers a brief portrayal of this research. This research has made use of and referred to various primary and secondary data which is available on the Internet as well as Hardcover in the form of

articles, research papers, thesis, books, blogs, and other statistical data by various reputed sites and publishers. This research also uses some other miscellaneous sources which include legal research databases, commentaries, and documentaries which are duly accredited with appropriate references and citations hereunder.

## INTRODUCTION

Neuroscience is the field that deals with the study of the nervous system with the goal of gaining knowledge of how the brain controls the body and behaviour of a person, giving rise to consciousness. This has made an important contribution to the treatment and prevention of neurological and mental illnesses.

As a result of the most recent scientific and technical advancements, our criminal justice system continues to be pushing the acceptance of new forms of evidence. One of these recently acknowledged evidences is the neuroscientific evidence<sup>1</sup>, which has generated significant controversy due to its early age and inexperienced. Defence counsel can utilise this tactic to lessen or even completely absolve their clients' criminal liability.

This research analyses the relationship between people's consciousness and their freedom and responsibility when committing a crime and how this tool may be used to establish and, in some cases, mitigate an offender's guilt. The research focuses on the many kinds of neuroscientific evidence and whether they qualify as relevant in terms of analysing criminal responsibility and sanctions. The research paper also focuses on the barriers to the presenting of this evidence throughout both the trial and the sentencing process.

Over the last several decades, there has also been a tremendous development in the neuroscientific equipment accessible for both criminal prosecution and defence. The twentieth century saw enormous progress in neuroscience, and notably neuroimaging, from the introduction of electroencephalography (EEG) in the 1930s through the first magnetic resonance imaging (MRI) scans carried out on people in the 1970s. These resources not only enabled researchers a closer look into the composition and operation of the human brain, but they also helped specialists understand the relationship between the brain and behaviour. The relevance of this link has been especially clear in the courts. The possibility for using

---

<sup>1</sup> Brown, T., & Murphy, E. (2010). Through a Scanner Darkly: Functional Neuroimaging as Evidence of a Criminal Defendant's Past Mental States. *Stanford Law Review*, 62(4), 1119–1208.  
<http://www.jstor.org/stable/40649625>

neuroscience as evidence in court cases has expanded along with its advancement in scientific contexts since the turn of the century. Neuroscientific evidence can theoretically be used to support or refute any allegation in a criminal prosecution, just like any other sort of evidence. This demonstrates that the use of neuroscientific data can influence court judgements, such as those involving the death penalty, and other punishments which generally granted by the judicial system. Besides that, it also focuses on the factors like any mental disease diagnoses and perceived hazards which might temperate the minimising impact of such evidences.

### **What is 'Neuroscience' or 'Neuroscientific Evidence'?'<sup>2</sup>**

The study of the nervous system, which is composed of the brain, spinal cord, and nerves, is known as neuroscience. Every part of the body is under the direction of the brain, including movement, respiration, and even basic biological functions like emotion and memory. The main focus of neuroscience is the study of behaviour, namely the motivations behind our actions and how the brain processes them. It also addresses the root causes as well as the treatment of illnesses of the neurological system. Whereas,

The term "neuroscientific evidence" refers to all expert testimony involving the anatomy or functioning of the brain or the use of neuroimages as an evidence. For example- A defendant's incapacity to stand trial can be proven as well with the help of neuroscientific evidence such as brain scans and cognitive testing. Evidence based on neuroscience studies and research is referred to as having a neuroscientific foundation. The structure, operation, and operations of the brain and nervous system are being studied using scientific approaches. Neuroimaging (such as fMRI, EEG, and PET scans), behavioural investigations, molecular and cellular research, clinical observations, and other methods are used to gather information in the field of neuroscience. Neuroscientific evidence sheds light on the functioning of the brain, how it affects behaviour, and how it is influenced by a variety of variables, including heredity, environment, and disease. Understanding the brain mechanisms governing cognitive processes, emotions, perception, learning, memory, decision-making, and other aspects of human functioning is aided by this study.

---

<sup>2</sup>Monahan, K., Steinberg, L., & Piquero, A. R. (2015). Juvenile Justice Policy and Practice: A Developmental Perspective. *Crime and Justice*, 44(1), 577–619. <https://doi.org/10.1086/681553>

### USE OF 'NEUROSCIENTIFIC EVIDENCE' IN THE INDIAN COURTS<sup>3</sup>:

In comparison to some other jurisdictions, the use of neuroscientific evidence in judicial proceedings in India<sup>4</sup> is somewhat restricted. Although the use of neuroscientific evidence in Indian courts is still developing, it has the potential to reveal important details about a person's mental health, cognitive capacities, and brain functioning. The Indian Evidence Act, 1872<sup>5</sup>, which lays out the requirements for evidence admission, largely governs the acceptability of neuroscientific evidence in Indian courts. According to the Act, all evidence must be pertinent, trustworthy, and founded on recognised scientific standards. These requirements must be met for neuroscientific evidence to be considered admissible.

The admissibility of neuroscientific evidence is not addressed by any explicit clause in the Indian Evidence Act, nevertheless. As a result, the admissibility and weight assigned to such evidence in Indian courts are decided on an individual basis, at the judge's discretion. The court may take into account elements such as whether the evidence is relevant to the case and material, if it is credible from a scientific standpoint, and the credentials of the expert who provided it. Neuroscientific evidence has been used in court in a few recent cases in India. For instance, in certain criminal trials, brain imaging methods like fMRI have been utilised to evaluate elements like the defendant's state of mind or cognitive disability. However, the consequences and acceptance of such evidence have varied, and its persuasive power may be influenced by the particulars of each case as well as the judge's comprehension and acceptance of neuroscientific concepts.

It is important to note that the use of neuroscientific evidence in Indian courts is still in its infancy, and that precise rules for its acceptance and use require further training, study, and legal precedents. The use of neuroscientific evidence in Indian courts is anticipated to increase as the discipline of neuroscience develops and its conclusions are accepted more broadly, although it may take some time for the evidence to be accepted and integrated into the legal system.

---

<sup>3</sup> Underwood, E. (2016, January 21). Growing use of neurobiological evidence in criminal trials, new study finds. *Science*. <https://doi.org/10.1126/science.aae0261>

<sup>4</sup> Monahan, K., Steinberg, L., & Piquero, A. R. (2015). Juvenile Justice Policy and Practice: A Developmental Perspective. *Crime and Justice*, 44(1), 577–619. <https://doi.org/10.1086/681553>

<sup>5</sup> Arora, H. (2012). Presumption Under Indian Evidence Act, 1872. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3530459>

## **IMPACT OF 'NEUROSCIENTIFIC EVIDENCE' DURING CRIMINAL TRIALS IN INDIA:**

In India, the use of neuroscientific evidence in court is still a relatively new practise, but its significance is beginning to be understood. Neuroscientific evidence is used in Indian courts, although there is no explicit statute or structure controlling it. Instead, its significance is determined case-by-case.

### **The following are some ways that neuroscientific evidence may have significant impacts on criminal proceedings:**

**Understanding brain function:** Neuroscientific study can shed light on the functioning of the brain, including mental processes like moral judgement, impulse control, and decision-making processes. This information may help us comprehend criminal behaviour more thoroughly and may even cast doubt on long-held beliefs about responsibility and free will.

**Examining mental state or mental conditions:** Neuroscientific evidences can be used to assess a person's mental state at the time of a crime using neuroscientific techniques like functional magnetic resonance imaging (fMRI). This information may be important in assessing the defendant's level of blame or culpability by taking into account elements like purpose, premeditation, or impaired capacity.

**Examining mental illnesses and competency:** Neuroscientific evidence can be helpful in determining a defendant's capacity to stand trial or their mental state at the time of the offence. Brain imaging methods and neuropsychological evaluations can offer unbiased information on any brain abnormalities, cognitive deficits, or mental problems that can limit a defendant's capacity to comprehend the legal proceedings or hinder their defence.

**Considerations for the sentence:** Neuroscientific evidence may aid in sentencing by disclosing information about an offender's chances for rehabilitation, recidivism risk, or the existence of mitigating circumstances. It can assist in selecting the most suitable treatments, treatment programs, or alternative sentencing choices in light of a person's neurological traits and capacity for behaviour modification during legal proceedings.

**Implications for ethics and public policy:** The disclosure of neuroscientific information prompts inquiries about ethics and public policy. It raises questions about how to strike a



balance between civic duty and the influence of the brain on criminal behaviour. It also calls into question the necessity of expert evidence and scientific standards in courtrooms, as well as the possible misuse or misinterpretation of data from the field of neuroscience.

It is significant to note that different countries have different policies regarding the admission and weight of neuroscientific evidence in criminal trials. To achieve fair and just decisions, the legal system must carefully assess the scientific validity, dependability, and relevance of such evidence. Additionally, in order for judges, attorneys, and juries to properly assess and analyse the complicated scientific material offered, the incorporation of neuroscientific data should be supported by appropriate education and training. The application and significance of neuroscientific evidence in Indian criminal trials are still developing, it is vital to mention. There may be future improvements in how neuroscientific data is taken into account and incorporated into the Indian legal system as the area develops and scientific understanding grows.

### **WHETHER THE USE OF 'NEUROSCIENTIFIC EVIDENCES' FULFILLED ITS PURPOSE IN THE INDIAN LEGAL SYSTEM?**

The application of neuroscientific evidence in Indian law is still in its infancy, and there is continual discussion and examination of its influence and usefulness. It is difficult to say for sure at this point if the use of neuroscientific evidence in the Indian judicial system has properly served its objective. However, there are a few things to take into account while assessing its efficacy:

**Case-specific Relevance:** Depending on the distinctive facts and characteristics of each case, the influence of neuroscientific data on judicial decisions may vary. The effect and success of the neuroscientific findings depend significantly on their applicability and strength in addressing the particular difficulties highlighted in a case.

**Legal precedents:** To provide direction and uniformity in its application, the formation of legal precedents and case law surrounding the use of neuroscientific evidence is crucial. The development of legal precedents in India may help to shape the function and influence of neuroscientific evidence in the legal system as more cases using such evidence are brought before Indian courts.

**Expert Testimony and Interpretation:** The credentials and experience of the specialists presenting and interpreting the evidence in court determine the reliability and potency of the neuroscientific evidence. The successful use of neuroscientific discoveries in judicial procedures depends on the availability of qualified neuroscientists, forensic specialists, and legal professionals who can clearly express and comprehend the findings.

**Awareness and Acceptance:** Legal professionals, such as judges, attorneys, and forensic specialists, must be aware of and accept the legitimacy of neuroscientific evidence in order for it to serve its intended function. To properly evaluate and incorporate such data in court processes, there has to be a greater knowledge of neuroscientific methodologies and concepts.

The Indian judicial system is still developing its use of neuroscientific evidence, therefore assessing how well it serves its intended purposes is a continuous process. The establishment of precise rules, improving knowledge of neuroscientific concepts, and assuring the right application of such findings in the Indian legal environment all depend on ongoing study, education, and communication between the scientific and legal communities.

## CONCLUSION

As already said, the use of neuroscience evidence in courtroom symposiums or criminal trials has been increasing substantially, but this blossoming evolution raises a number of questions that need to be answered. The two languages—those of law and of neuroscience—are utterly unlike. A set of guidelines must be created by the specialists in both professions to determine when a particular defendant's neurological profile complies with the law. These regulations need to be carefully scrutinised because if they are too lax, the guilty will go free, and if they are too stringent, the innocent will suffer. Considering how newly established and inexperienced this industry is. By investing more time with the specialists in this field debating the kinds of evidence that are relevant to the courts, neurolaw scholarship among solicitors and jurors should be strengthened. The jury members who are unfamiliar with this field should be given a synopsis of the evidence by experts. This is important because judges are charged with the task of reviewing the evidence and formulating any judgements based on it; as a result, the decision should not be based on erroneous information.

It's also important to deal with the "double-edged sword" situation, which is characterised as carrying significant hazards. When it seems that the criminal poses significant future hazards to the public, the prosecution frequently makes use of neurological evidence. According to a



certain experience, the defense lawyers are obviously worried by this fact, though. Despite all of these problems and difficulties, neuroscience has the potential to improve the current retribution-driven system by working to both prevent crime and assist in offender rehabilitation. In order to address the causes of such antisocial behaviour, neuroscientists would concentrate on dangers and treatments.

