

**Interpreting evidence and the brain in legal domain:  
Do the stereotypes come in?**

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**Abstract**

Does evidence have anything to do with stereotypes? Why do people speak lies and indulge in deception? The purpose of telling the truth is contingent on knowing the truth, and that truth has value in the collective sense. The brain is positioned as that authentic source that has been predicted by some to develop the legal decision-making system. This scientific knowledge may surpass the rationality and intuition of judges. In one way, it is a boon, and in another way, it is shaping the whole framework of our knowledge system, where knowledge from brain studies reify our understanding of human actions and thinking.

*Keywords:* Brain, evidence, interpretation, stereotype, law

Can we understand others' mind? Can we understand ourselves? Mind is the deeper and most undecipherable aspect of the self of which sometimes people are not conscious. If at many instances, we are not conscious at some moment about our mind whose meaning gets shifted some or the other time, we don't get a reliable understanding of the mind and if something like this exists, we don't have a consciousness to catch it as it is. If one has difficulty to catch one mind there is meagre hope of understanding the other mind. For the sake of formal engagement with the alterity such as doctors the discourse may get the frame in a particular context about any issue in the brain which is hampering the normal activities of the person. The codification of law in general doesn't correspond to the biology of individuals but the commonsensical understanding about the nature of human beings and their roles and responsibilities. The goodness of cause doesn't necessarily make the action valid and justifiable. Similarly, if the brain is assumed to be the cause of any action, doesn't make that action morally grounded and reasonable. Brain has got its face with the ever-increasing imaging techniques giving superior forms of detailing of its varied area. As Kant<sup>1</sup> advised that people should not be treated as things, further to this, it can be inferred that the brain is also not

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<sup>1</sup> <https://plato.stanford.edu/entries/persons-means/>  
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anything but has its dignity. The dignity and freedom build up the history of people who suffered and struggled for social change. If the dignity and freedom come at stake through their mechanization and instrumentalization, history will lose its memory and what will remain is the world of zombies with no consciousness which is essentially needed for the new versions of social change. In the Indian philosophy, it was noticed that the actions, thought, and speech, contrary to the statute of scriptures such as Veda, is considered as crime<sup>2</sup>. The construct of pure and impure is hard-lined in the socio-religious texts and has deeply occupied the mind in a taken for granted way.

### **The future of brain-based evidence in law**

It was argued that the law is in fact an instrument of oppression that is wielded by elite members of society against those who are disadvantages, especially members of racial and ethnic minority group ( Sidanius & Pratto, 1999; Tyler & Jost, 2007). The rise of evidence and metatheoretical speculations which sharpens the evidence can have varieties of meanings for lawyers and scientists. Some of the articles like “is science different for lawyers” (Faigman, 2002) showed a positive picture of experts from different disciplines who can contribute to courts. My concern here is to look for metatheory which steered the experts’ orientations in the design of methods and assessment of data, both at the group level and individual level. There were many cases in which the biases in the form of stereotypes attributed towards the people of minority and disadvantaged community based on one’s gender, caste and social class. As court look for evidences which in some way linked to the data-based impression of some phenomenon under observation, it is equally possible that data may be wrongly attributed or categorized. For example, there were gross bias discovered which machine makes while predicting the crime of convicted in the future. It was observed that people from the minority groups such as Blacks were predicted to be at high risk of committing crime as compared to the White groups as per the computer program (Angwin, Larson, Mattu, & Kirchner, 2016). The rise of neuroscience in the court room may increase the variety of evidences but still the broader perspective under which these evidences are interpreted is not much in varieties. The neuroscience shows that how much brain is important in our behaviour and denying its importance due to overlapping of functions of brain areas may not give a full picture of human

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<sup>2</sup> Manusmriti, law book of Yajnavalkya, law code of Gautma, Visnu-dharma-sutra, Vasistha-dharma-sutra: They all as per D. Chattopadhyaya, criminalized the act of questioning Vedas (see further free thinking as a crime). In D. Chattopadhyay (2015). What is living and what is dead in Indian Philosophy. New Delhi: People’s Publishing House.

action, thoughts and social relationship. Jones, Buckholtz, Schall, & Marois (2014) advocated that the legal domain needs to look into different evidences in order to come to better conclusions, and the human picture is incomplete if brain studies are excluded in the holistic understanding of human being.

The future of brain research is not neutral to the metatheory and within its own specialized area, the interdisciplinarity of science disciplines are more pronounced. The wider connection of brain science with the social science discipline where both enrich the position of one other is needed. In social sciences, there are critical social theories which are marker of emerging area of critical psychology which itself doesn't regulate by the disciplinary boundaries. In one-way critical psychology is different from the psychology which is more limited by its methodological individualism. The meaning of evidence is not disconnected by this methodological individualism and imperialism which shaped the meaning of verdicts and legal decision making. Brain research is a powerful area which connects to various disciplines claiming to offer an applied knowledge about the human behaviour. Brain research steadily progressed as other avenues of psychology and other disciplines moved forward. As the matter is becoming complex where new perspective of thinking and understanding the world emerges, so a new challenge is created for the brain research. Since brain research cannot stand on its own created platform, as it also corresponds to human behaviour which is also a social behaviour, the continued association is needed to understand human biological structure, self and its intermingling with the social symbols and everyday interactions.

The question where does the brain research led can also be understood in terms of where society and law lead, since brain science talks about the structure and function of the brain, its propositions always correspond to neurochemical and social actions, complex network which is nurtured under the periphery of law. Though law subscribe to its concepts and categories, its emphasis on evidences for the verdict announcement sometime fall short off in understanding the true cause. Fontaine (2012) showed that the logic behind understanding the relevant cause where he stated an example in which both the ice cream sale and shark attack increases in the summer time. This doesn't imply that one is the cause of other and vice versa, however, both are driven by the third variable, that is, summer heat, in which people eat ice cream to cool off and swim in the water where the possibilities of sharks are not denied. It is important to be logically clear about the relevance of causal relationships and the moderators under which this relationship flourish. It will be a logical fallacy to relate the irrelevant variable just because they are always happening at the same time without understanding the broader environmental,

individual and sociocultural factors. As Hume showed skepticism about the cause and speculated that they are merely impressions, Thomas Reid was more positive about the existence of the productive cause which produce an effect and change by the exertion of its power which is beyond physical exertions (see also Bragues, 2008). He advocated about the active power without which “we cannot be morally responsible, and yet it is manifest that we do have active power and that we can be morally responsible” (Roseser, 2005, p. 70; Yaffe, 2004). The power to act and not to act despite the contrary circumstances goes beyond the general understanding of the person as merely a shaft moved by the wind.

Legal domain does not first locate the cause rather it starts from the instances of any action or crime and moves back in order to fix upon the cause which is most fitting into its precedents. Brain data and its evidentiary step is secondary to the law and primary is the descriptions, for example, the way any legal scene (crime) is described in the court. Here court is content with the logic that data may never ends, that is, data will always be in dearth and there will be no time when we can be confident that data are enough. Since it is expected by the legal agents, plaintiff, defendant, media and general audience that verdict should come and must be justified logically. The long clash with the experts about the limitations of evidences and insufficiency of data led to the emergence of legal imaginations and strict reliance on the precedents which are needed for the effective legal decision making and training the prospective lawyers. Evidence determines linkage of action with the intentions, and that is good enough for the agents in the legal circle to appropriate their decisions. Going further into the brain signatures of the intentions or centering their decision on the available neuroscientific data, goes contrary to the very ground of the legal domain which somehow believes in the free will. The dialectic of determinism and free will is utilized very carefully by the experts and the lawyers and by looking into the possible proportions (e.g., what is it in control and what not) form their impression of the person’s responsibility.

The issues of ecological validity (Brunswik, 1949) about the true brain data when the person was engaging with people and the social object seems to be limited because of the problem of neuroimaging techniques to provide exact data in the real world (Shamay-Tsoory, & Mendelsohn, 2019). Recently, researchers (Holleman, Hooge, Kemner, & Hessels, 2020) questioned the ecological validity presumed to be generalizable by the psychologists conducting lab experiments. They advocated context specific and context generic principles of cognition and behaviour. What was done or committed already happened in various context in that time and fixing upon those actions limits the idea that consciousness is in flow and in

movement. What is located in the brain through these techniques is con-committed to that very context and time. This is a debate which law find incompetent and unsubstantiated, however, the “context in which neuroscience evidence is introduced (e.g. sentencing context in order to mitigate the culpability of the defendant) (see Catley & Claydon, 2015), provides an ideal environment where admissibility considerations are reduced and evidence of a defendant's current physical or mental state is relevant (unlike some liability questions, where the only relevant mental state is the one that existed at the time of the crime and cannot be measured during litigation)” (Meixner, 2016). There was also the debate around the consequences of confounding by non-imaging categorical variables while dealing with the neuroimaging data. In this context, Linn et al (2016) suggested inverse probability weighting to deal with these confounding variables such as age and sex, in the process of multivariate pattern analysis (MVPA) of the complex spatial disease effect across the brain. Sometime these non-imaging variables have profound confounding effect upon the person and locating the exact structure of the brain becomes difficult because of their confounding effect in the process of MVPA<sup>3</sup>.

Brain researcher mostly called as neuroscientists and neurologists who investigates the nervous system prominently, brain structure and its functioning during some engaged thought process, free thinking, behaviour or actions in some context. Since brain is a complex organ and neuroscientists had shown its importance in our behaviour, the rise of research in neuroscience and its interdisciplinary connection and application to many domains had ever increased its importance as a normal science. Though its application is ever increasing in court, its spread among the masses seems like ‘other world’ of science and little evidence is there about how brain comes to the common sense or ‘meaningfully infiltrated lay thinking’ (Connor & Joffe, 2014, 2015). The utilization of words in our everyday discourses requires logic of culture and community to interpret the meaning of the discourses. Though other science language, especially, few terminologies related to medical science or other has intervened, the brain terminologies were limited to one’s cultural expression of ‘something in the head’ or locating the position of something which may be responsible for the tension or stress or as a cite where thinking happens. Since court had kept important check over the fake science or wrong distribution of knowledge among the public, it is inevitable to check the social representations of technical with which people construct their social reality and meaning

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<sup>3</sup> According to Linn et al (2016), “The goal of MVPA is often two-fold: (i) to understand underlying mechanisms and patterns in the brain that characterize a disease, and (ii) to develop sensitive and specific image-based biomarkers for disease diagnosis, the prediction of disease progression, or prediction of treatment response”. (P. 31)

system. The brain research is just not metaphorical aphorism but is based on strict neurological evidences about the form and function together with the defects constraining the person from normal performance. Evidence search belongs to the domain of legitimate science and authority and any kind of alternative way of approaching the cause is dismissed in the legal domain. Of all the evidence, neurological evidence had been recognized as most important along with the forensic evidences.

Other information which showed the power dynamics or critical aspects of neuroscience and forensics is all tertiary and limited to the small academic circles. Though the brain-based mind reading (BMR) techniques are supposed to operate at different phases and sometime may detect something in the unconsciousness, it is difficult to match up with the hard problem of the consciousness which says that the person is not aware of what he knows or something that had passed through the person unnoticed. This may lead to the information from the brain which even the subject doesn't know but the examiner knows (Meynen, 2017). The use of implicit association test along with the BMR to understand the deep-seated knowledge which the person uses tacitly, seems promising to the neuroscience and hence the legal domain. The problem comes when BMR is coercively used in the forensic psychiatry and the relationship between psychiatrist and patient taken as authentic relationship with authentic procedure. The chances are high that these aspects may be uncritically processed by the law under the garb of evidence in action.

Neuroscience with its clean brain picture and expert interpretation offers competing evidence leading to its admissibility either as collaborative and eclectic evidential venture or replacing the less complete evidences which are based on junk scientific methods<sup>4</sup>. The legal domain's own precedents and methods is paramount and based on the defendants questioning and coming to some conclusion about the person's involvement and responsibility for the restricted action. Other evidences only add or enrich the set conclusion based on the judges' intuitions and rationality, conversely, if any swiping evidence intervene in the court proceedings with clear and appropriate instances of oppositely equal value. Here scientific evidence with clear distinction between outdated and updated reconnaissance makes its presence more powerful. The steady rise of interest in neuroscience with its closely examined picture of the brain expanded the people knowledge about the human socio-cognitive functioning. But this understanding is more tangible and observable rather than the

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<sup>4</sup> Douglas Starr in his article titled "framed by forensics" made a case against the use of out-of-date science in court which may eventually lead to the 'tragic miscarriage of justice'. Retrieved from: <https://aeon.co/essays/time-to-clean-all-the-junk-science-out-of-our-courtrooms>  
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understanding of reality gained through experiences and societal interventions. The knowledge acquired from experiences is enacted and demonstrated in the social world and approved by the people, as compared to the scientific understanding which emanates in the laboratory and leaked into the everyday reality of the people through different channels. One of the intriguing points is about the manner in which neuroscience intervene in the court and provides a compelling biological insight. The knowledge which neuroscience gathers and situates in discussing the case of defendant is made admissible and facilitated by the judges, depending upon their reliance, as neuroscience can't be offering aloof evidence in the name of reliability and validity, but it needs to be interpreted. The idea of who is the competent interpreter of the expert evidence seems to be a matter of available norms and discourses surrounding the court since neuroscience offering aloof evidence with proper reliability and validity but that should be persuasively presented and demonstrated in the court. A pertinent point raised (Meixner, 2016) in this direction was about the logical first step in questioning the relevance and value of neuroscientific evidence, criticism of methods of expert, and seriousness of neuroscientific evidences. It is predicted, for example, that "Neuroimaging is going to be common form of evidence in the courtroom (Meixner, 2016), however, it also depends upon the culture and different jurisdiction's comfortableness with the neuroscience.

The debate from a long time in law, centered on the truth and facts, evidence, data and interpretations, the gravity of the action and intentions, model penal code, deontology and utilitarianism. In that lieu, law showed both its controlling and responsive picture depending upon the history, culture, belief system and latent social assumptions. Together, people also try to understand how identities, power and status quo ally. There is something in law which law itself is ignorant about or take for granted and anyone not under its periphery becomes the victim of law's ignorance. Here evidence and data itself becomes problematic in their interpretations by the agents. We can take an approach from critical psychology to distinguish facts, the truth about the persons and their stereotypical understanding, from the taken for granted understanding which are banal and established as common sense. Neuroscience is expanding and so its fascination. It may be inferred that through the neuroscience the flow of the human thought and intentions as per the universal nature of human being can be projected tangibly in the empirical world. The complexity of nerve entanglements as depicted in computer mediated pictures and sophisticated neuroimaging techniques, has grand effect on the judgment of the people, for example, general audience and judges at the decision-making position. There is no space to question these forms of brain, as they look as natural like any

other natural objects. However, sometime back the paradigms of social science were skeptical about the neuroscience fascination as it was generally confined among the scholars interested in finding the neural mechanism of human psychology, but not anymore in that aggressive way. The rise of neuroscience and its popularity has gained importance among the scholars of social science who has to answer the most basic questions related to the human science, embodiment of consciousness and the history of evolution. But as the time shifts with different forms of fascination and renouncement, so neuroscience with its grand picture may find some alternative critiques which may become more persuasive in explaining the human nature.

The question of human existence in the social space is all in all answered in one's best capacity to understand the situational consequences of action and the disciplinary responses, the alternatives to give the best explanation ahead of the neuroscience can be systematic rejection of the neural mechanism and the adoption of more concurrent view emanated from the socio-political-geographical landscape of everyday linguistic exchanges. However, the neuroscience empirically shows the concrete neural basis of human behaviour but human behaviour and subjectivities are formed and rejected in the social space and capturing the atomist cause of varieties of thoughts and action can only be placed in one systematic format. We cannot say then this is the ultimate format of explaining the human relationships, actions, and intersubjectivities. What can be inferred in the passage of time is again the most general view of human. We in our daily life don't go by the scientific findings but by the common-sense understanding of the same. The difference between the understanding of mechanism between psychologists or neuroscientists and the general populations who don't have to go by the hard experimental and neuroimaging complexities always persisted, since the linearity between cause and effect keeps going on among the different domains of scientists and societal members, in other words, between people who are interested in finding the cause through the sophisticated experiments and people who lives on their own experience and precedents to understand the cause behind. Though the say of the recognized science such as medical science has important impact on the people, which is also communicated among the general population via government, media and one's personal interaction with the scientific knowledge.

It is well established idea that human brain and consciousness are related. Though brain seems to be the ultimate starting point of one's everyday interactions, the human science like psychology expands beyond neuroscience in explaining the cause of human behaviour. Neuroscience is limited to the brain and psychology encompasses many terrains of human thoughts, social relationship, languages and culture. The question is about the way of



understanding the brain by neuroscientists. Is it the only way or direction which encompasses the understanding of brain cited to be the most important biological point of whole human life process? Do we stop here or move further in understanding the human social life as it is not just a biological make up but what it makes human is its sociality and management with the social signs and symbols (see Mead & da Silva, 2011). Everyone possess a brain can be a fact shown by using various methods of observation. Even anyone who has not gone through any kind of brain scanning is assumed to have a brain, however, it is not that we see person as a brain but holistically as a social being with personality, emotions, political orientations, family affiliation, as an organizational member, person belonging to some cultural, indigenous or religious group. Psychology also offered a reductive view of human but little less than neuroscience, though, there are other interdisciplinary avenues which can understand mind, including the brain functioning and wider social trajectories comprising, social identities, culture, and geography. The concerns that only neuroscience has the authenticity of understanding the brain is short-sighted, as clarity is not reached whether brain neural firing is connected in any causal way to the magnificent human thought and behaviour. Blakeslee and Ramachandran (1998) stated that neuroscience is at the stage of Faraday rather than Maxwell and giving a unified theory about brain is not possible as happened in physics. The rush to come out with exact match of brain and consciousness is hasty effort and extrapolation, just like, a parent who may think that giving growth tonic to the child will speed up the development process. There is something about the human biological nature which need to be respected and reaching at some point of maturity doesn't guarantee that person will not engage in any act considered to be rational.

### **Bayesian approach to law and neuroscience**

Does brain follow Bayesian rule? The neuroscience can never boast on the basis of something probabilistic and subjective, it has to be objective, determinist and logically interpretative as per the scientific rules, in order to claim about the brain function and the human behaviour (Horgan, 2016). The way Bayesian approach is becoming popular in neuroscience, it cannot be sure, that its popularity if at the equal level among the lawyers. Since the approach is to detect the consciousness on the basis of neuroscience and particularly in the legal domain, the role of brain in understanding how much the person is responsible. The interdisciplinary connection between law and neuroscience may also demand one of this approach to infer subjectively about the cause of the action, intention and responsibility. Law

doesn't have many degrees of freedom, as it doesn't suit its credibility and neither its legitimacy among the population. The Bayesian approach to infer or predict the future course of action (e.g., recidivism) is more on the basis of past experience rather than the formal application of Bayesian principle. The knowledge about the self and identity of others may be stereotypical also and deriving the facts out of limited understanding may not muster the holistic understanding about others. It will be like bootstrapping the small amount of data or generalizing (Lake, Salakhutdinov, & Tenenbaum, 2015) on the basis of imagery one holds about others, esp. those who belongs to the minority group and lives in an invisible way in the deep psyche of dominant groups. Any small click of protest threatens the whole dominant groups and stigmatize the generations of the minority groups. There is little contradiction that these elementary and basic biases take the huge shape in the judgment and the reasoning. Does neuroscience have anything to do with this? The way Bayesian approach appeals the cognitive scientists, evolutionary theorists, statisticians and many emerging interdisciplinary social sciences, it has a full chance to be influencing the law whose expressions in the academic debate strives for drawing the line between right and wrong, moral and immoral, or normal and abnormal. However, the judgment and verdicts fix on some principles of understanding that is very much influenced by the severity and intensity of information and memories about the groups different from the identity of the judges. In the words of Damasio (2012), 'Our memories are prejudiced, in the full sense of the term, by our past history and beliefs' (P. 133). He further observed that 'the notion that the brain ever holds anything like an isolated memory of the object seems untenable. The brain holds a memory of what went on during an interaction, and the interaction importantly includes our own past, and often the past of our biological species and our culture' (P. 133). The estimating ability of our brain is all about the inferences based on the previous recording of interaction of entities with the objects, both social and physical. Vygotsky and Luria (1993) showed through their cultural historical approach that brain doesn't operate its consciousness program in an isolated manner but very much through the organism activities and engagement within the sociocultural context.

### **Conclusion: Is there a politics of evidence?**

Why does the truth matters? Moreover, if it matters, why people speak lie and deceive information? The purpose of telling the truth is contingent on knowing the truth, and that truth has value in the collective sense. Here the most authentic source is a brain science which is predicted to rule the legal decision-making system. This scientific knowledge may surpass the

rationality and intuition of judges. In one way, it is a boon, and in another way, it is shaping the whole framework of our knowledge system, where knowledge from brain studies reify our understanding of human actions and thinking. What is that superficial knowledge and deep knowledge? Does it have something to do with the truth? The statement about the existence of sun in the universe, no doubt is a truthful statement and having the knowledge about this truth doesn't affect the truth at all. Because the truth is truth. Not knowing about this truth and having different knowledge about the same phenomenon doesn't change the truth in any way. Thus, the evidences and observation about the truth statements only changes the opinion about the truth, not the truth itself. So, the person who don't know the reality of existence of some phenomenon and has some belief about the phenomenon, when asserts his knowledge about the phenomenon, doesn't lie or engage in deception, but is true to his understanding. Lie is a conscious act of manipulation of knowledge leading away from the fact and fitting it to the category of truth, like deception which is also conscious where the truth is hidden under the frame of neutrality.

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