The Path to a Fair Justice System: Integrating Neuroethics in Court

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In Manhattan, New York, 1992, a man by the name of Herbert Weinstein was a 68-year-old man who seemed to be the typical everyday neighbor. He had no criminal history and was described as a non-violent individual. However, on January 7th, Mr. Weinstein was accused of strangling his wife. He then threw her body out of their 12-story apartment building in attempt to make it appear as though she had taken her own life. Upon being questioned by police, Weinstein seemed to lack remorse when confessing his crimes which seemed very out of character based on what his family and friends described him as. This brought up many questions within his legal team which led them to administer some cognitive test on him. A Positron Emission Tomography (PET) Scan was conducted on Mr. Weinstein which revealed a large cyst pressing against his frontal and temporal lobes. The results of the PET scan showed that areas of his brain tissue were being compressed by a large cyst which had been diminishing his glucose metabolism. The slowed rate of his glucose metabolism could be used to explain Mr. Weinstein's lack of impulse control as well as his sudden aggression at the time of the crime and emotional changes post crime. With this information Herbert Weinstein's attorney presented these scans to the judge and claimed his client to be not guilty by insanity. The case of *New York V. Herbert Weinstein 1992* is described as one of the most notable instances of brain scans and neurotechnology as useful evidence in criminal trials (Rushing, 2014).

Similarly, cases like *U.S. V. Hinkley 1981* where abnormalities in the accused individuals brain led to an assassination attempt on at the time President, Ronald Reagan, sit in the same boat. In many cases like that of Mr. Weinstein's or Mr. Hinkley, if their legal teams had not had suspicions of neurological impairments, their punishments could have been much worse (Aggarwal & Jain, 2023, p.13). Both cases had the verdict of "not guilty" for reasons of insanity; however, many cases have flown by without cognitive tests leading to punishments deemed

inaccurate for the circumstances of the crime. I believe that the U.S. justice system would be a more fair, equal, and accurate system if it were to make these tests a requirement in criminal trials.

Arguably, the topic of psychological testing goes as far back as the ideas of classic philosophers such as Plato and Aristotle. Of course, today's technology and findings have advanced way beyond those times, but the ideas and observation of human nature through philosophical findings were the foundation of today's idea of psychological testing. In present day, neuroscience and neuroethics have been used in criminal trials to test for the individuals cognitive state while their crimes were committed. Topics regarding the involvement or lack of mens rea, also known as "guilty mind" and actus reus, also known as "guilty act" play large roles in convicting criminals and determining if testing is needed. With actus reus, in criminal law we usually get this information straight from the scene. These include the physical aspects or omission elements of a crime, such as situations like driving while intoxicated or leaving a child alone in a car for several hours on a hot day—activities that are prohibited or constitute prohibited acts.

While actus reus is an important part of the criminal law procedures, mens rea is the true crime detector. Mens rea is extremely important in criminal trials because it reveals whether there were intentions of committing a crime while knowing the consequences or the outcome. As stated in their article on criminal intent, the Legal Information Institute with Cornell Law states that the Model Penal Code (MCP) requires convictions in all four categories of criminal intent; these four categories are Acting purposely, knowingly, recklessly, and negligently (Cornell, 2022). With each specific case, these four categories are rated with different levels by MPC guidelines based on criminal intent. The higher the rating is, the higher the defendant is rated on their mental state. This is where criminal testing comes in. In many cases we may assume the

ratings of these categories to be higher or lower which can make the mens rea inaccurate. This is so important when giving convictions because if their criminal intent is incorrectly recorded, it can lead to longer and harsher sentencing. This is why we need to implement psychological testing in all tests in court settings. For example, if a person commits the crime of manslaughter but his CT (computed tomography) results show that a large tumor has grown in his frontal lobe, this can substantially change criminal intentions. Most issues with the frontal lobe, including tumors, can cause changes in planning and decision-making skills as well as personality changes, often changes in personality result in aggressive behaviors. If an individual is acting based on a biological or medical issue, where their ability to have full control of their actions and behaviors is impaired, is it fair to give them the same conviction as someone who is knowledgeable about their decision? To give every individual this protection and fairness of extreme punishment for situations that were out of their control, we need to start implementing these tests and getting the full picture of the situation.

As stated in the example cases of Weinstein and Hinkley, neurological exams were conducted to explain their abnormal behaviors. While conducting these evaluations, examiners were able to reveal that psychological testing can show evidence that the defendant's mens rea is not entirely up to par. This means there are inaccuracies in criminal intent that need to be further discussed. Of course, this does not mean the individual would not completely get away with his crimes. However, instead of a punishment as extreme as the death penalty, they may be held in a psychiatric hospital or facility for a long period of time, or until they are no longer deemed a threat to themself or others.

Figure 1

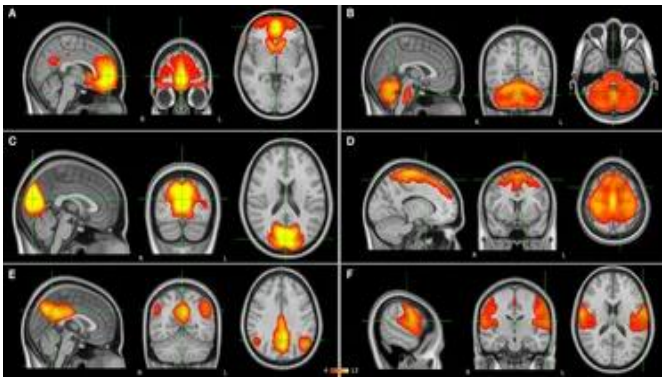

Figure 1. fMRI comparing brain activity in a normal brain (left) and a brain with schizophrenia (right). The scans on the right show the prefrontal cortex is lacking brain activity (areas marked with red/yellow) which affect emotions, behavior, and cognition. The temporal lobe is seen to have high levels of activity which can cause imbalances in emotional regulation as well. (Noora T. , Alex H. , 2023)

While some may agree that neurological testing benefits the justice system and those involved, others believe that there are many factors that may make the process harmful. The biggest example is regarding the people reviewing the tests. Researcher John Pyun (2015), notes that many components can lead to misinformation and faulty results. He states:

> When evaluating the validity of an expert opinion or testimony, judges may assess a variety of factors, including, the falsifiability of the scientific theory or evidence, its error rate, whether it has been peer reviewed and published, and whether the theory or evidence has attracted widespread acceptance within the relevant scientific community. (Pyun, 2025, p. 1025)

Throughout his article he mentions that these factors can be contributors to implicit bias. Implicit bias is defined as the subconscious perceptions and opinions that are made based on prior knowledge rather than fact and observation. In Pyun's argument he states that judges may make incorrect calls based on their own bias rather than the facts put forward. While I would agree that this is something to pay attention to, I would argue there are preventative measures and strict guidelines put in place to avoid issues that implicit bias could cause. In this same article by Pyun (2015), he mentions that even with all these factors listed above, that each situation is seen on a case-by-case basis which determines the validity of the results. He writes:

> Despite these factors, however, the Court granted judges wide discretion in assessing expert testimony, allowing each court to make its own determination regarding the admissibility of scientific evidence in each case. (Pyun, 2015, p. 1025)

With this statement, the previous claim that judges use false judgement via implicit bias is debunked. By stating that many of these evaluations are validated case-by-case is a preventative measure on its own. Working case-by-case, if the correct regulations are implemented correctly and carefully, we should be able to avoid the issue of biases and incorrect interpretation of testing. This only further proves my point that with proper guidelines neuro tests can be quite useful in criminal trials.

Another one of the biggest controversies when it comes to the usage of psychological tests in court settings revolve around ethical concerns. Of course, neurological evidence alone cannot excuse all criminal acts and behaviors, so the question that many researchers have begun to ask is: at what point do we draw the line between what accounts for biological liability and what accounts for personal responsibility? In present day, topics like this seem to be difficult to touch on as we want to avoid stigmatizing certain individuals by failing to consider their biological information. Researchers Maya Sabatello and Paul S. Appelbaum (2018), with the National Institution of Health (NIH) note that best attempt to avoid this controversial issue is to implement the findings of experts in the clinical field. In their article titled “Behavioral Genetics in Criminal Civil Courts,” they write,

> Forensic experts and other mental health professionals will likely have a critical role in the presentation of behavioral genetics in court … forensic scientists and mental health professionals who will be called to testify in court will have an added duty to ensure the accuracy of their testimony and an important responsibility in contributing to the administration (para. 5)

With these statements the researchers are saying that in most cases where biological evidence is evaluated, they will have the forensic experts who evaluated the individuals testify in court to better sway the decisions of the jurors and judges. The use of having these individuals testify with the legal responsibility of providing truthful and accurate findings better guarantees sincerity and fairness of the accused. This implementation will better assure the issue of ethical concerns as well as avoiding misinformation and decisions of which cases are biologically responsible or personally responsible.

As stated before, there have been many criminal cases where behaviors occurring during the crime did not match up with behaviors previously seen with the criminals. If we were to implement and encourage cognitive assessments in courts, it could be the big difference between being seen as guilty or not guilty. As stated by researchers Neil Krishan Aggarwal and Abhishek Jain (2024) in the article titled "Neuroethics and neurolaw in forensic neuropsychiatry: A guide for clinicians," they note:

> Assessment is aimed at, whether a criminal defendant has sufficient ability to consult with his lawyer with a reasonable degree of rational understanding, and whether he has a rational as well as factual understanding of the proceedings against him. Assessment for fitness to plead or stand trial includes assessing the ability of the accused to understand the charges he/she has been accused of ability to distinguish between a plea of guilty and not guilty, ability to instruct his/her lawyer and ability to follow the proceedings in the court. Positive symptoms of psychosis especially thought disorder and delusions have been known to be associated with unfitness to plead. (p. 13)

Getting accurate interpretations of test results is pivotal in court settings because it's one of the most determining factors when it comes to criminal responsibility. It's crucial to precise and detailed breakdowns of these results and to properly explain them, professionals are needed. This

is almost always guaranteed to increase the likelihood of the judges and jurors understanding the information being presented, therefore giving the defendant a fair shot at a fitting punishment.

Regardless of the differing ideas on the usage or necessity of cognitive neuroexams in law settings, I think most would agree that if they are being used there should be strict guidelines. While there are some guidelines set in place for these situations, they are often on a case-by-case basis and dependent on the judge's decisions for the case. By this statement I'm not implying that all criminals should get lesser sentencing or that criminals who plead insanity by biological means are innocent. Instead, I'm saying that the justice system should take more notice and caution when handling criminals. Instead of working on case-by-case basis to decide if testing is necessary, we should be preventative and use tests as a precautionary action. To make a difference in the way that we convict criminals we need to update the guidelines for courts and testing. By doing this we can ensure that every person gets fair treatment in their trial, and we can eliminate most of the ethical issues and biases that are seen today. We should pay closer attention to the little details and issues because they can make a large difference in criminal cases and can heavily affect the lives and futures of people on trial.

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