Recently, cognitive neuroscience research has shown a relationship between the physiology of a person’s brain and a tendency to engage in violent or criminal activity (Morse 113). Using this knowledge, the government could find, treat, and isolate people with these neurological signs to make society safer. However, using neuroscience to detect predispositions to criminal activity would breach the doctrine of presumed innocence, a cornerstone of our country’s judicial system since its inception. Holding people accountable for actions they may commit --based on the composition of their brain, which they cannot control-- strips them of their basic legal and human rights. Even though using cognitive neuroscience to prevent crime may make people’s lives safer, it would do so at the expense of indispensable civil liberties, and would create a society not worth living in.

Neuroscience is not new to legal investigations and trials. Courts have long called on neuroscientists and psychologists to testify as expert witnesses, usually to comment on a defendant’s state of mind or to interpret her actions (Jones, et al 730). In *People v. Weinstein* (1992), the State of New York tried Herbert Weinstein for allegedly strangling his wife and throwing her body off a tall New York City apartment building to make her death appear to be a suicide. Weinstein willingly confessed to committing the crime and the attempted cover-up, but showed a lack of emotion or guilt when discussing the incident. Weinstein underwent a Positron Emission Tomography (PET) scan, which revealed decreased brain function due to an arachnoid cyst pushing on his frontal lobe. His attorneys motioned to include the PET scan images to argue that the court should not hold Weinstein responsible for his actions due to mental disease or defect. The prosecution objected that the PET scan results might sway the jury to grant Weinstein a more favorable outcome if it believed his “my brain made me do it” type defense.
Despite the prosecution’s protests, the court ruled that the PET scan evidence was admissible. The prosecution quickly offered Weinstein a plea bargain for a lesser charge of manslaughter, and he accepted it (Rosen). *People v. Weinstein* exemplifies how significantly neuroscience can influence the prosecution to propose plea agreements, and juries to recommend and judges to hand down lighter sentences for those convicted.

Similarly, in *Florida v. Nelson* (2010), defendant Grady Nelson received a lesser sentence than the prosecution requested, due to neuroscientific evidence of mental disease or defect. In 2005, police arrested Grady Nelson in Florida for allegedly killing his wife and raping his mentally-disabled stepdaughter. During his trial, the defense presented testimony by an expert witness, neuroscientist Robert Thatcher, who had examined Nelson following his arrest. Thatcher testified that he used quantitative electroencephalography (QEEG) technology to view the electric activity in Nelson’s brain, and discovered unusually sharp waves generated by the left frontal lobe region. Thatcher testified that he believed Nelson’s brain abnormality likely led him to commit his crimes. After brief deliberation, the jury rejected the death penalty and instead recommended a sentence of life in prison (Jones 730). Following the trial, two jurors told the *Miami Herald* that the QEEG exam evidence had significantly influenced their decisions. One juror, John Howard, told the Herald’s reporter that he initially favored the death penalty but completely changed his mind after hearing Thatcher’s testimony: "it turned my decision all the way around … the technology really swayed me. After seeing the brain scans, I was convinced this guy had some sort of brain problem” (Ovalle).

*People v. Weinstein* and *Florida v. Nelson* are just two of many examples of neuroscience’s role in influencing sentences handed down in recent legal proceedings. As in both of these cases, courts have typically used neuroscience to assess a defendant’s state of mind and
self-awareness after he has committed a crime. Using this information, neuroscientists offer expert opinions as to whether a defendant ought to be held responsible for her actions, and how this should influence a jury’s decision or a judge’s sentencing order. But as our knowledge of neuroscience increases, the possibilities for how we can use it to discipline and even prevent crime grow immensely. Owen Jones, a biology and law professor at Vanderbilt University, is a recognized authority on neurolaw, an emerging interdisciplinary field dedicated to the growing intersection of neuroscience and the law. Jones and Rene Marois of the Vanderbilt Brain Institute explained in a 2007 interview with legal scholar Jeffrey Rosen that they were studying human brain activity when people are asked to assign punishments to understand “the interactions among the emotion-generating regions of the brain, like the amygdala, and the prefrontal regions responsible for reason” (Rosen). Jones and Marois had so far produced two important observations from their studies: (1) The prefrontal cortex is important when a judge assigns punishments, and may be an important factor in jury selection, since some jurors may be predisposed to selecting one punishment over another; and (2) By scanning and observing the fusiform area of the brain, responsible for facial recognition, scientists can observe people’s true thoughts and emotions even if they deny them.

Jones provides a hypothetical situation to emphasize the implications of this discovery: if a child says she has been victimized by a stranger, the police could observe the fusiform region of her brain while showing her photos of suspects. If one of the photos causes the fusiform region to light up, this would suggest that the victim has seen the face before. The police could then pursue that suspect’s connection to the crime further. This process would be more reliable than suspect lineups used today, as scientists now believe that our subliminal memories may be more reliable than our cognizant ones (Rosen). In 2015, Jones reflected that their research will
likely help create a more accurate criminal investigation process and will combat “decision-making biases” that currently plague the judicial system (Buckholtz 1369-1380). Jones and Marois believe that although these techniques are still in their early stages, they could have serious implications for the future of criminal convictions, punishments and prevention; by noting more trends in brains of people who have committed crime, they are learning more about what a “criminal brain” looks like-- in other words, what police might look for when trying to identify who may be --or become-- a criminal.

Jones and Marois’ research suggests that we may soon be able to use neuroscience to screen for potential criminals in order to combat crimes before they are committed. As our knowledge of the signs of a “criminal brain” grows, the possibility of a neurological test for predisposition to crime increases as well. Over the last decade, many scientists, lawyers, and academics have been exploring the option of using this technology to make society safer. But many scholars point out that when considering using science to prevent crime, it is not just a question whether we can, but if we should.

Law professor O. Carter Snead focuses on the moral and ethical implications of using cognitive neuroscience to predict crime. Snead argues that depending on neuroscience in criminal law and punishment --beyond neuroscientists lending expert testimony in trial as they do today-- raises complicated problems about “human agency, moral responsibility, and the proper ends of criminal punishment” (132). If we separate a person’s brain from the person herself, and view the two as independent agents, assigning responsibility becomes practically impossible. If a person commits a crime but neuroimaging scans suggest that a neurological condition motivated the crime, we cannot hold that person’s brain accountable while we acquit the rest of her. Similarly, allowing that person to resume life without consequence poses a risk to
society, because a person with a predilection to crime is now roaming freely. Snead points out that if we gain knowledge of a person’s predisposition, there is no clear, morally sound course of what to do with this information: punishing people for their predispositions is immoral since they have not done anything wrong, but doing nothing with that information is reckless.

Scientists also debate how accurate these brain scans will be in predicting whether someone will actually commit a crime. In “Neurocriminology: Implications for the Punishment, Prediction and Prevention of Criminal Behavior,” researchers Andrea Glenn and Adrian Raine explain that while neuroscience may point to a predisposition to criminal behavior, this does not always translate into criminal activity. A person’s environmental factors can play a large role in determining whether she will act on her predispositions, and are arguably more important than the anatomy of her brain. For someone with a neurological abnormality that suggests criminal behavior but is not great enough to constitute mental disease or disability, her perceptions of societal norms may deter any violent tendencies she is predisposed to (Glenn and Raine 60).

For example, a woman who displays the signs of a disposition to violence may never be violent towards another person during her life. If she did not grow up seeing violence around her, and adults told her that violence is unacceptable and inexcusable, she likely developed coping mechanisms other than violence to use when she is upset. Despite her neurological propensity to crime, society would not regard this woman to be a danger to public safety. Isolating or punishing because of her brain scan results would be wholly unjust. While scientists previously believed that our brain chemistry is immutable once we are born, they now concur that this is empirically false. Matthew Hougan and Bruce Altevogt explain, “the discovery of neurogenesis and an improved understanding of neuroplasticity—the ability of the brain to shape, form, eliminate, and strengthen new connections throughout life—has completely recast the question
of nature versus nurture” (14). Neuroscience alone cannot predict behavior with absolute

certainty, and we should not trust it to predict whether people will commit crimes during their

life.

Even if neuro-technology were accurate at predicting criminal activity, this would still

contravene the most fundamental values of our judicial system. One major conflict would be

between prediction and the constitutional guarantee of presumed innocence. The United States

has long considered “innocent until proven guilty” one of the cornerstones of the American legal

system. Lawyer and legal scholar Francois Quintard-Morenas explains that the doctrine serves as

a “shield against premature punishment” and protects the integrity of our judicial system (148).

Without this safeguard, the government could upend any person’s life without definitive proof of

wrongdoing. No accused person can be sentenced or punished without substantive evidence of

her crime and the chance to have a fair trial before a jury. If people were imprisoned or punished

because their brain scans reveal a possible predisposition to criminal activity, this would presume

their guilt before they have done anything wrong. The Founding Fathers were adamant that

American citizens be able to live their lives without fear of the government infringing on their

safety or freedoms as reflected in our Constitutionally-protected “unalienable rights to life,

liberty and the pursuit of happiness.” A neuroscience crime prevention policy threatens to violate

all three of those rights.

Using neuroscience to punish people for actions they might commit in the future would

create a society where no one feels safe. Scientists agree that neuroscience cannot predict

behavior with absolute certainty since it does not factor in environmental factors that cause the

brain to change over time. Regardless, acting on knowledge of neurological propensity to crime

would be unacceptable under a legal system built on the doctrine of presumed innocence.
Neuroscience can provide valuable insight to the law when combined with facts and other frames of reference, but alone, is too fallible and rife with ethical complications to predetermine legal punishments. While it is the US government’s responsibility to protect American citizens, it should not do so at the expense of basic civil liberties and fundamental legal rights.

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Works Cited


