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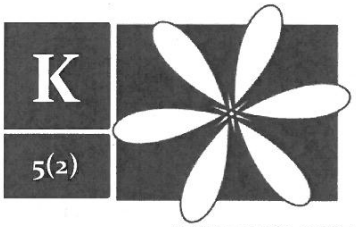

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Neurolaw and the Future

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There are different definitions of neurolaw in circulation, but it is essentially an umbrella term for the application of neuroscience by various disciplines to the legal system. This ranges from sophisticated forms of lie detection to improving our understanding of how jurors reach decisions. Vincent, Hall and Kennett state that:

> Neurolaw is a relatively new and highly-interdisciplinary field that brings together researchers from the social sciences, mind and brain sciences, law and philosophy, as well as public policy and law professionals to examine the potential for neuroscientific discoveries and techniques to address a range of pressing legal and social problems. (2013, 1)

Goodenough and Tucker go into greater detail:

> Areas of special attention in current neurolaw scholarship include (a) techniques for the objective investigation of subjective states such as pain, memory, and truth-telling; (b) evidentiary issues for admitting neuroscience facts and approaches into a court proceeding; (c) free will, responsibility, moral judgment, and punishment; (d) juvenile offenders; (e) addiction; (f) mental health; (g) bias; (h) emotion; and (i) the neuroeconomics of decision making and cooperation. (2010, 61)

This paper is concerned with how neuroscience can help us determine which offenders should be considered blameworthy and therefore worthy of criminal punishment. There is currently an issue with the unreliability of the technology in use, and the premature application of emerging technologies before their reliability is even known. A far more profound problem is the differing perspectives of neuroscience and law. Assessment of blameworthiness is a normative

question, a moral judgment, rather than a result of pure descriptive science. The science cannot dictate the legal decision, although it may well be used to inform the legal rules.

The law classically divides a criminal offence into an objective element, aka *actus reus* or guilty act, and a subjective element, aka *mens rea* or guilty mind. This division is a relic of Cartesian dualism. Although in many cases it is not possible to have direct evidence of the offender's mental state, jurors are expected to make inferences from his conduct. Given the difficulties in this exercise (which have led to a general increase in many jurisdictions of strict liability crimes), the prospect of technology that would give us access to the inner mental states that determine criminal liability is alluring. However, another issue is whether or not these techniques represent an acceptable invasion of privacy and/or infringement of the right to not incriminate oneself.

The impact of nature and nurture on criminal responsibility is not a new discussion. Clarence Darrow pleaded for clemency for Leopold and Loew in the 1920s. They were not disadvantaged teenagers, but the well-educated offspring of wealthy businessmen, who had murdered a stranger. Darrow argued that because everything has a cause, therefore they could not be held responsible for their actions (Sternberg 2010). This interpretation of determinism would probably lead to the end of the criminal justice system as we know it. Dershowitz rails against the pervasive nature of determinism-based excuses in *The Abuse Excuse*, where he cites the "Abuse Excuse," the "Urban Survival Excuse," "Adopted Child Syndrome," "Black Rage Defense" and "Super Sunday Syndrome" among other questionable legal tactics (Dershowitz 1994). Many of the excuses cited in his polemic did not succeed or were pleas in mitigation, so his claims need to be kept in perspective.

It should not be assumed that the courts, often seen as quintessentially conservative, have been slow to embrace new technology. Often the problem has been that the claims of neuroscience have been taken at face value. The chief critic of the exuberant adoption of neuroscientific evidence is Stephen Morse, himself both a psychologist and a lawyer. He describes:

> Brain Overclaim Syndrome [BOS], "that often afflicts those inflamed by the fascinating new discoveries in the neurosciences … the essential feature of which is to make claims about the implications of neuroscience for criminal responsibility that cannot be conceptually or empirically sustained." (Morse 2005-6, 397)

More specifically, he outlines the "fundamental psycho-legal error," which is to "believe that causation, especially abnormal causation, is per se an excusing condition" (Morse 2005-6, 397). The finding of an abnormality of the brain, whether functional or anatomical (a recent study of voxel-based morphometry of the brain by Scarpazza et al, 2013, found that there was no defined normal brain study by this modality), does not automatically entail that a person should not be held criminally responsible for their actions.

The restrictive approach of the courts to the insanity defence prevents the expansion of this defence, but neuroscientific evidence has been employed in sentencing hearings. Different

jurisdictions can have very different definitions of insanity. The most stringent test is probably the McNaughton rules, which require that someone is either not able to know right from wrong, or was unable to tell that his act was wrong (whether this means morally or legally wrong is debated). It excludes many people with mental illness, particularly anyone with a personality disorder. At the other end of the spectrum is the Durham test, which only requires that the crime be the product of the mental illness. The Durham test would be much more open to the introduction of evidence about functional or anatomical abnormalities of the brain. It would also be much more prone to Morse's psycho-legal error.

In two cases in Italy, the presence of the so-called "warrior gene" and other neuroscientific evidence resulted in lighter sentences (Hamzelou 2011). The warrior gene is one particular variant of the MAO-A gene which has been linked to anti-social behaviour and violence. Controversially, it was found that this gene has a high prevalence in the Maori population in New Zealand (Wensley and King 2008). The research was condemned for stigmatizing one community, with echoes of the eugenic movement. However, this gene has only a minor influence on behaviour compared to other factors such as upbringing and environment. In particular it was found that anti-social and violent behaviour was increased when the gene was combined with an abusive childhood. After the recent school shooting in Connecticut, there were proposals to sequence the genome of the killer, Adam Lanza (Kolata 2012). The evidence is against genes playing an important part in individual behaviour. Heritability of criminal and anti-social behaviour is 0.12 and 0.62 – that is, 12-62% of the difference in anti-social and criminal behaviour is down to genes (Farahany and Coleman 2009).

The difficulty that defences based on a pre-disposition present is that the accused may face a heftier sentence on the grounds of public protection. Thus they may decide not to introduce this type of evidence on tactical grounds. One empirical study found that evidence of a biomechanical cause for psychopathy significantly reduced sentencing (Aspinwall et al 2012). It is interesting to consider why biomechanical causes had a greater mitigatory effect than environmental issues. It may be due to a bias towards considering biomechanical causes to be more deterministic. The introduction of the construct of dangerous and severe personality disorder (DSPD) demonstrates the desire of politicians to predict and prevent violence (McAlinden 2001). Attempts to extend detention to those not convicted of any crime faltered in the face of opposition from psychiatrists and others, but these remind us of the dangers to liberty which these predictive technologies might raise.

Another difficulty is that some of the personality disorders invoked to argue diminished responsibility are defined in terms of anti-social and criminal behaviour. Thus the argument becomes circular – a syndrome partly defined by criminal and anti-social behaviour is characterised by criminal and anti-social behaviour. If a psychopath's brain is shown to be structurally and functionally different from the typical law-abiding citizen's brain, is that enough to absolve him of some or all responsibility? The presence of a particular brain state shown by an

MRI scan cannot tell us whether that brain state caused that behaviour, or whether the choices of the individual caused that brain state. In some respects we are back to the arguments of the nineteenth-century alienists like Ray who spoke of "monomania," evidenced only by the propensity to commit criminal acts (Tadros 2001, 325). The criminal law's weakness is that it appeals to folk psychology in deciding who should be held responsible. Neuroscience certainly does have a role in helping the actors in the criminal justice system to better adjudicate who is more blameworthy and who is less so. Whether or not the criminal justice system is capable of distinguishing good science from bad science is another matter.

In conclusion, the difficulties with neurolaw illustrate two main points: the benefits of genuine interdisciplinary research, and the pitfalls of simply applying research from one discipline to another. Simply discovering and describing the activity of the brain does not and probably will never provide a definitive answer to whether or not someone should be held criminally responsible. For this reason alone, neuroscience must be used with caution in the courts.

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