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Neuroscience, the study of the brain and nervous system, is a complex, multidisciplinary field of study. Yet the claims currently being made for neuroscience are often bold and simple. In short, some argue, it can explain human nature - it can help us comprehend anything from why people hold the political opinions they do [Ref: [Atlantic](#)] to why some people get on in life and others don't [Ref: [US News](#)]. It's all in and, to a large degree, determined by the physical workings of the brain. Central to advances in neuroscience has been the development of functional magnetic resonance imaging (fMRI), a procedure that measures brain activity by detecting associated changes in blood flow – resulting in the Technicolor images of different areas of the brain lighting up that many of us are now familiar with from the popular media. Specifically in relation to the law, as one academic notes, neuroscience 'has captured the imagination of those who make, enforce, interpret and study the law' [Ref: [New Atlantis](#)]. And it is not difficult to see why. If, as Professor Eagleman argues, 'Your consciousness is like a tiny stowaway on a transatlantic steamship, taking credit for the journey without acknowledging the massive engineering underfoot', then traditional notions of criminal and legal responsibility are radically undermined [Ref: [Telegraph](#)]. It is no longer a matter of criminal intent. Little wonder that, as a professor of psychology at the University of California argues, 'Defence lawyers are looking for that one pixel in their clients brain scan that shows an abnormality - some sort of malfunction that would allow them to argue: "Harry didn't do it. His brain did."' [Ref: [Legal Affairs](#)].



Diminishing responsibility

To hold somebody responsible for a criminal action is to assume that individual was capable of choosing to do otherwise (hence the existing legal category of diminished responsibility [Ref: [Crown Prosecution Service](#)]). And it is this claim that neuroscience seemingly casts into doubt. Take the recent case of American rapist and murderer Brian Dugan, thought to be the first time fMRI scans of brain activity have been used as evidence in the sentencing phase of a murder trial. Behavioural neuroscientist Dr Kent Kiehl discovered that the part of the brain responsible for processing emotions, the para-limbic system, was considerably less dense in Dugan than in other test subjects. His conclusion was that Dugan was not evil or bad, but was suffering from a disorder [Ref: [NPR](#)]. Likewise, the defence lawyer of a British man accused of a series of indecent assaults was keen to attribute his client's behaviour to a possible brain injury occasioned as a result of a car crash. The lawyer said that his client 'was of previous good character and had been leading a normal teenage life as a keen rugby player, until the crash in April 2006' [Ref: [This is Bath](#)]. Although these examples are particular, the implications are potentially general. As law professor Jeffrey Rosen questions, 'since all behaviour is caused by our brains, wouldn't this mean all behaviour could potentially be excused?' [Ref: [New York Times](#)]. Matthew Taylor, chief executive of the RSA, envisages this as a positive scenario where 'moral judgement of criminal behaviour is replaced by a view that some criminals have diseased brains that need to be treated' [Ref: [BBC News](#)]. It is not just in cases of extreme wrongdoing that neuroscience is making perception-changing inroads. Currently in England and Wales the legal age of responsibility is set at 10 years of age. Yet, as the Royal Society reported at the end of 2011, some regions of the brain – including the parts responsible for decision-making and impulse control – are not

fully mature 'until at least the age of 20' [Ref: [BBC News](#)]. The chair of the working group that compiled the study emphasised that it was for policy makers to decide on altering the age of criminal responsibility, but that new science provided 'incontrovertible evidence' that the brain continues to develop throughout adolescence with implications for how adolescents behave.

The limits of neuroscience

Others are more cautious about what neuroscience has to offer when it comes to understanding criminal actions, for example, pointing out that mass murderers rarely suffer from serious mental illnesses [Ref: [Telegraph](#)]. Indeed, whilst suggesting that the relevance of neuroscience to the law will likely be greater over the coming decades, the Royal Society also cautioned about the limits of our current understanding and the danger of leaping from correlations to assumptions of causation. The report states: 'although mental processes are helpful in explaining the relationship between brain and mind, the mappings from brain activity to mental process and from mental process to behaviour, remain complex and poorly understood' [Ref: [Royal Society](#)]. There are also those who regard the discussion about neuroscience and the law as yet another example of the widespread over claiming for, and misapplication of, neuroscience. The clinical scientist and philosopher Professor Ray Tallis, whilst applauding the considerable achievements of neuroscience that have benefitted his work, is one such critic. According to Tallis, attempts to make sense of our conscious minds in terms of neural activity fail dismally because we are social beings: 'we are not just our brains: societies are made of people who are not brains' [Ref: [New Humanist](#)]. According to this argument, the problem is not simply the limits of our current state of scientific knowledge, but a fundamental conceptual misunderstanding

about how to make sense of ourselves as social beings. As Stephen Morse, Professor of Psychology and Law in Psychiatry, argues, it is people, not brains, who commit crimes which is why decisions of guilt are for the courtroom not the laboratory: ‘neuroscience . . . can never identify the mysterious point at which people should be excused responsibility for their actions’ [Ref: [The Times](#)].

A question of free will

Fundamentally then, it is the question of our freedom, of our capacity to consciously determine a course of action, that underpins objections to the legal usefulness of neuroscience. The philosopher Roger Scruton argues that neuroscience cannot explain why we choose particular courses of action any more than it can explain the source of love or the origin of art. Any attempt to do so, he argues, ignores the role of our conscious mind: ‘The invention of “neurolaw” is, it seems to me, profoundly dangerous, since it cannot fail to abolish freedom and accountability — not because those things don’t exist, but because they will never crop up in a brain scan.’ [Ref: [Spectator](#)]. Those arguing that the law needs to take into account the latest insights from neuroscience are well aware that ‘freedom and accountability’ do not appear in brain scans. The reason for this, they conclude, is that free will does not exist, certainly not in the way that we have become accustomed to understand it, and should be more accurately viewed as a delusion. That is why neuroscience promises to revolutionise our idea of criminal responsibility. Without free will, there can be neither responsibility nor guilt. This is not simply a cynical legal defence, however. It is underpinned by a far-reaching philosophical viewpoint, one that assumes humans to be more automaton than author of their actions. As one philosopher explains, ‘Instead of saying my decision arises from free will, we might say, “My decision was determined

by internal forces I do not understand.”’ [Ref: [Chronicle of Higher Education](#)]. This idea resonates more widely in contemporary culture, and the argument that advances in neuroscience and psychology show that ‘people are useless at making choices’ is frequently accepted in media reporting [Ref: [Guardian](#)]. So is Professor Eagleman right to demand that the law stops addressing itself to an idea of how it believes we ought to behave and starts looking at how we actually do behave? Could this, as he suggests, allow us to reorient our legal systems to become ‘forward looking’, focussing instead on a different set of questions: ‘How is a person likely to behave in the future? Are criminal actions likely to be repeated? Can this person be helped toward pro-social behavior?’ [Ref: [Atlantic](#)]. Others counter that such a view is too reductionist. It portrays people, effectively, as wholly determined by natural laws. Frank Furedi, for example, accepts that our genes and our neural make-up no doubt influence our behaviour; but this does not mean that our genes or our brains determine our behaviour. He argues: ‘We are not the slaves of our biology and possess a formidable capacity to make our own world and, on a good day, to even choose who we want to be.’ [Ref: [Australian](#)] Aware of the misapplication of their work, some neuroscientists have argued for neuroscientific evidence to be incorporated into policy debates, but for scientists to also closely monitor its use to prevent it being used a rhetorical vehicle for espousing particular values or ideologies [Ref: [Neuron](#)]. Whilst some may welcome such an approach as a more productive way forward, in reality, does the question of whether neuroscience should transform our understanding of the law rest on the fundamental question of determinism and free will?

ESSENTIAL READING

A brief guide to neuroscience

Vaughan Bell *Observer* 29 April 2012

How neuroscience is changing the law

John Cookson *Big Think* 4 October 2011

There's more to humans than biological burps

Stuart Derbyshire *spiked* December 2008

FOR

The End of (Discussing) Free Will

Owen Jones *Chronicle of Higher Education* 18 March 2012

Brain science and the law: should we understand more and condemn less?

Matthew Taylor *Guardian* 15 November 2011

The Brain on Trial

David Eagleman *Atlantic* July 2011

Eventually, science will kill capital punishment

E J Montini *Arizona Republic* 29 May 2011

In control? Think again. Our ideas of brain and human nature are myths

Madeleine Bunting *Guardian* 23 August 2009

AGAINST

Neuroscience wants to be the answer to everything. It isn't.

Roger Scruton *Spectator* 17 March 2012

Criminal responsibility is social, not scientific

Luke Samuel *Huffington Post* 15 December 2011

Is that biological determinism in your genes, or are you Gaga about free will?

Frank Furedi *Australian* 19 February 2011

Misreading the mind

Jonah Lehrer *Los Angeles Times* 20 January 2008

Why blame me? It was all my brain's fault

Raymond Tallis *The Times* 24 October 2007

IN DEPTH

The brain... it makes you think. Doesn't it?

David Eagleman and Raymond Tallis *Observer* 29 April 2012

Free Will Is an Illusion, but You're Still Responsible for Your Actions

Michael S Gazaniga *Chronicle of Higher Education* 18 March 2012

Do You Have Free Will?

Neuroskeptic 6 January 2012

The Brain on the Stand

Jeffrey Rosen *New York Times* 11 March 2007

Neuroscience and the Law

The Royal Society

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BACKGROUNDERS

Brain Scans: Modern-Day Phrenology or Analytical Tool? Part II

TheBestSchools.Org 7 May 2012

Is Free Will an Illusion?

Chronicle of Higher Education 18 March 2012

The Legal Mindfield

Wellcome Collection 8 March 2012

The Brain on Trial

The Kavli Foundation December 2011

Big Picture on Thinking

Wellcome Trust September 2006

Neuroscience fiction in newspapers

Guardian

Neuroscience

Guardian

ORGANISATIONS

Neuroethics, The Dana Foundation

Neuroscience and the Law

Society for Neuroscience

The MacArthur Foundation Research Network on Law and

Neuroscience

The Oxford Centre for Neuroethics

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IN THE NEWS

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Quest for the connectome: scientists investigate ways of mapping the brain

Guardian 7 May 2012

Can't work, won't work: Slackers are 'hard-wired to be lazy', claim researchers

Daily Mail 2 May 2012

Huge Study Finds Brain Networks Connected to Teen Drug Abuse

Newswise 29 April 2012

Science in court: Arrested development

Nature 18 April 2012

Should the Science of Adolescent Brain Development Inform Public Policy

Marketwatch 3 April 2012

Neuroscience could mean soldiers controlling weapons with minds

Guardian 7 February 2012

Indecent assaults by brain-injured man

This is Bath 5 January 2012

Scans could catch benefits cheats

Belfast Telegraph 13 December 2011

Age of criminal responsibility 'too low', experts say

BBC News 13 December 2011

Courtroom neuroscience not ready for prime time

Science Insider 12 December 2011

Can brain scanners judge age of criminal liability

New Scientist 22 September 2010

Brain Scan Lie-Detection Deemed Far From Ready for Courtroom

Wired 1 June 2010



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- I am a sixth form student and would like further details about events in my area
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- I am interested in sponsoring/supporting Debating Matters
- Other (please specify)

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Surname

School/company/
organisation

Professional role
(if applicable)

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Postcode

Email address

School/work phone

Mobile phone



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TRISTRAM HUNT, HISTORIAN & BROADCASTER