

## **Neuroethics: The Law and The Person**

By Matthew Tieu

### **Introduction**

Since the molecular structure of DNA was discovered in 1953 by Watson and Crick<sup>1</sup> the field of molecular bioscience has made rapid progress and profound contributions to the related fields of medical science, reproductive medicine, agriculture and biotechnology, to name just a few. The ability to manipulate DNA and a more detailed understanding of the cellular basis of life as embodied in contemporary molecular bioscience, meant that biological traits could be altered, novel treatments for diseases would become available, the human lifespan possibly extended, and somewhere in a not too distant past was the suggestion that broccoli could be made to taste like chocolate, which would supposedly mitigate a parent's concern for their child's diet. But with all this so-called "Frankenfood" and "Frankenscience", these issues amongst many others have commanded attention not only from scientists and other academics but also ethicists, politicians, theologians and perhaps more pertinently, the public in general. Societies are now more aware of the implications of the molecular biosciences and DNA technology, and such knowledge has transformed the discipline of bioethics and has massively broadened its scope.

We are forced to address many ethical issues that are inevitably raised with the advent of new discoveries, new knowledge and new science. Cognitive neuroscience is one of these relatively new sciences and much like the molecular bioscience that transformed bioethics, cognitive neuroscience raises an entire gamut of ethical issues that have the potential to transform the way we view ourselves as human beings and moral agents. Cognitive neuroscience is the study of the mind as equivalent to the brain, given that it is founded on a materialist paradigm, according to which the mind reduces to physical processes associated with brain function<sup>2</sup>. Hence cognitive neuroscience aims to understand the mind purely via an investigation of the brain as a biological system. Despite the philosophical and methodological debate concerning the nature of mind and body<sup>3</sup>, it is clear that the phenomena of selfhood, personhood, memory, perception, emotion and consciousness, are all inextricably linked to brain function. This also extends to logical inference, belief, judgement and decision making. Therefore there is a very profound and intimate understanding of ourselves to be gained from an

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<sup>1</sup> Watson JD, Crick FH. (1953) Molecular structure of nucleic acids; a structure for deoxyribose nucleic acid. *Nature*, 1953 Apr 25;171(4356):737-8.

<sup>2</sup> According to the "extended mind" thesis it is possible the mind does have some residence outside of the brain, see Andy Clark and David Chalmers - <http://consc.net/papers/extended.html>, hence if the so called "extended mind" hypothesis is correct then neuroethics will have expanded its scope further to implicate the external environment as relevant to the mind. See Levy, N. (2007) *Neuroethics: Challenges for the 21<sup>st</sup> Century*. Cambridge University Press.

<sup>3</sup> This debate is commonly known as the "mind-body problem", it is a debate concerning the metaphysical and ontological status of the mind.

investigation into the neural basis of the mind. As cognitive neuroscience progresses further we will have a greater understanding of the relationship between mind and brain, we will become increasingly aware of why people behave as they do and why certain people form certain beliefs. Furthermore, whilst the ethical issues raised by cognitive neuroscience are in many regards analogous to those raised by molecular bioscience, it seems that in the case of cognitive neuroscience, those issues are much more salient given that it is our very thoughts and feelings that are the subject of scientific scrutiny. Indeed the relationship between the self and the brain is much more proximal than that of self to genome. As Neil Levy states<sup>4</sup>:

*Our minds are in some sense, us, so that understanding our mind, and increasing its power gives us an unprecedented degree of control over ourselves.*

Neuroethics is a field of inquiry that is very broad in scope and is closely related to both cognitive neuroscience and bioethics, though it is now formally recognised as a discipline in its own right<sup>5,6</sup>. It is difficult to do justice to the breadth and depth of neuroethics; however, a brief mention of a few of the major themes in neuroethics will enable foresight into the wide ranging and profound ethical and social implications that are likely to result from 21<sup>st</sup> century neuroscience. One of the big questions of neuroethics concerns the notion of legal and moral responsibility, which will be briefly discussed in this review. The other major topic that also deserves some discussion is the notion of “personhood”. It is an issue that is central to many of the debates in bioethics.

## **What is Neuroethics?**

Neuroethics can be roughly divided into two streams. One stream concerns the more direct or proximal implications of cognitive neuroscience, which can be referred to as the “narrow” conception of neuroethics. It deals with the more personal and practical implications of neuroscientific knowledge. For example, the rapid progress in cognitive neuroscience promises to revolutionise the way we understand and treat neuropsychological disorders. It will enable us to restore and possibly enhance neurological function through novel neuro-pharmacological, neuro-stimulation and neuro-genetic engineering techniques. We may be able to develop novel treatments for depression, post traumatic stress, ADHD and many other personality disorders. We may also be able to either dampen or enhance other aspects of cognition depending on what one desires. The implications of brain imaging technology, which is now commonly used in both research and medical practice, raises issues concerning mental privacy, diagnostics and predicting behaviour. One of the ethical dilemmas is whether or not a patient has the right to know (or not to know) what their brain scans reveal about themselves and their futures. Furthermore, if this information were to fall into the wrong hands it could be used to manipulate and discriminate against individuals whose brain

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<sup>4</sup> Levy, N. (2007) *Neuroethics: Challenges for the 21<sup>st</sup> Century*. Cambridge University Press.

<sup>5</sup> Marcus, D. ed (2002) *Neuroethics: Mapping the Field*, Proceedings of the Dana Foundation Conference, University of Chicago Press.

<sup>6</sup> Kennedy, D. (2004) Neuroscience and neuroethics. *Science* 306(5695):373.

scans reveal information about themselves that would otherwise be private or unknown. Knowledge gained through neuroscience, along with brain imaging technology, may one day allow us to probe the human mind to observe even ones thoughts and predilections.

The second stream of neuroethics, can be referred to as the “broad” conception of neuroethics. In contrast to the “narrow” conception of neuroethics as previously defined, this stream of neuroethics is best understood as dealing with the distal implications of neuroscientific knowledge, i.e. the social and philosophical implications. The issue of therapy versus enhancement is pertinent here; should such knowledge be utilised to enhance our neurological function? What would be the long term social implications of such a profound change to our current neurological make up? Would we still be human or will we have transcended our neurological constraints to achieve a trans-human existence? And is this a desirable outcome? Then there is the issue of how we impute moral responsibility given that cognitive neuroscience may shed new light on the way humans make their decisions as well as the nature of our underlying motivations to act in certain ways<sup>7</sup>. How can we trust our moral beliefs if it turns out that one’s belief was not the product of rational contemplation but a *post hoc* rationalisation of an emotive judgement, an attitude of disapprobation or a pre-reflective moral intuition that is distinct, impenetrable and encapsulated from rational contemplation<sup>8,9</sup>. Does this picture lend greater support to moral relativism? Therefore, what neuroscience tells us will clearly have implications in regard to how we assess legal and moral responsibility, criminal liability and informed consent. We may have to change the way we impute responsibility of individuals whose actions may turn out not to be a product of rational agency.

Furthermore, there are also implications for debates about the notion of “personhood”. If personhood were to be defined according to necessary and sufficient criteria, which can be reduced to brain processes, then might we have a set of objective criteria to distinguish between persons and non-persons? Whilst this is an interesting debate in the philosophy of science in relation to issues of ontology and natural kinds, it has profound implications for debates concerning abortion, euthanasia, animal rights, embryos, brain death and organ donation. With the lack of consensus about what those necessary and sufficient criteria are, we may have to accept that personhood is an illusion and abandon the concept. Already there has been much reaction to such nihilistic implications<sup>10</sup>. This topic will be discussed later but for now let us turn our attention to the issue of legal responsibility.

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<sup>7</sup> Greene, J and Haidt, J (2002) How (and Where) Does Moral Judgement Work? *Trends in Cognitive Sciences*. Vol, 6, no. 12; pp517-523.

<sup>8</sup> Prinz, J. J (2006) The Emotional Basis of Moral Judgment. *Philosophical Explorations*, vol 9, no.1, pp. 29-43

<sup>9</sup> Fodor, Jerry A. (1983). *Modularity of Mind: An Essay on Faculty Psychology*. Cambridge, Mass.: MIT Press

<sup>10</sup> Farah, M. J. and Heberlein, A. S. (2007) Personhood and Neuroscience: Naturalising or Nihilating? *The American Journal of Bioethics*, 7(1):37-76 (Includes open peer commentary).

## Legal Responsibility – My Brain Made Me Do It?!

Neurological dysfunction is generally held to be relevant to a defendant's responsibility for their actions. Hence when diminished responsibility can be established by appeal to neurological dysfunction ("neuro-mitigation"), then it is reasonable that the defendant receives a proportionate punishment. However, the challenge of imputing responsibility is difficult given the multitude of the deterministic effects of brain function, genetic predispositions, experience and environment.

Will cognitive neuroscience undermine our traditional intuitions about moral and legal responsibility? Firstly, this depends on one's notion of free will. If one is *libertarian*<sup>11</sup> in regards to free will, then the answer is yes, because it is possible that neuroscience will reveal aspects of behaviour and decision making that are innately fixed, distinct, impenetrable and encapsulated from conscious rational deliberation. However, current legal doctrine is *compatibilist*<sup>12</sup>, and as cognitive neuroscientists Greene and Cohen have argued, our intuitions about free will are *libertarian*, therefore neuroscience will widen the gap between the legal sense of responsibility and our common sense notion of responsibility<sup>13</sup>. Furthermore, punishment (at least in the American legal system) is largely *retributivist*<sup>14</sup>, which is grounded in a *libertarian* notion of free will. Hence neuroscience may see our criminal justice system evolve away from *retributivism* towards a *consequentialist*<sup>15</sup> notion of punishment, i.e. that punishment is no longer a matter of retribution but of promoting future welfare.

Secondly, if neuroscience does change the way we view moral agency and free will, then it may place us on a slippery slope, whereby lawyers, can argue that, essentially, "my brain made me do it". For example, in the trial of serial rapist and murderer Bobby Joe Long, the defence invoked brain scanning evidence, along with citing a history of brain injuries and hormonal imbalances in an attempt to support pleas of diminished responsibility<sup>16</sup>. Perhaps blame lies with his overactive amygdala or his under-active prefrontal cortex. Such defences are being deployed with increasing frequency. So if our brains are running the show then our attitude to criminal responsibility, punishment and what we traditionally regard as morally imputable behaviour will be constrained by what neuroscience reveals.

However, the difficulty in application of such considerations is knowing where to draw the line in the chain of cause and effect. This has led some to suggest that claiming "my

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<sup>11</sup> The *libertarian* notion of free will refers to the doctrine that free will exists, in contrast to the doctrine of *determinism* which states that there is no such thing as free will or that free will is an illusion.

<sup>12</sup> *Compatibilism* is the doctrine that *determinism* is compatible with *libertarianism*, in regards to the free will debate.

<sup>13</sup> Greene, J and Cohen, J (2004) For the Law Neuroscience Changes Nothing and Everything. *Phil. Trans. R. Soc. Lond. B. Vol 359(1451): 1775–1785.*

<sup>14</sup> *Retributivism* is a doctrine of punishment that the guilty deserve punishment as their just desert, in contrast to utilitarianism which states that punishment serves the purpose of improving the situation by maximising utility or happiness.

<sup>15</sup> *Ibid*

<sup>16</sup> [http://www.crimelibrary.com/serial\\_killers/predators/long/9.html](http://www.crimelibrary.com/serial_killers/predators/long/9.html)

brain made me do it” is akin to claiming “the big bang made me do it”<sup>17</sup>. However, what such rhetoric reveals is not the absurdity of neuro-determinism but rather it brings to mind the philosophical conundrum of causal relations in general, but in the legal arena no jury can take seriously any defence that appeals to the outcome of the successful pregnancy of the defendant’s parents, anymore than the outcome of the big bang. This does narrow the scope of relevant causal relations significantly. The statement “my brain made me do it” is a kind of rhetoric aimed at demonstrating the absurdity of shifting blame away from oneself, when one is in fact blameworthy, just as it is absurd for a murderer to say “my finger pulled the trigger”.

Bear in mind however, that neuroscience enables us to distinguish between different domains in the brain and appreciate how damage to particular areas can affect our behaviour in an irreversible and permanent manner, while leaving other domains intact. Take the classical example of rail construction worker Phineas Gage who had a tamping iron thrust into his skull damaging his prefrontal cortex and subsequently transforming his personality. Whilst his basic faculties of intelligence remained intact, he became short tempered, unsociable, profane and unable to persevere with future plans<sup>18</sup>. It is because of his accident that people are reluctant to blame him for his behaviour, though there are many other cases where there are no such obvious neurological causes for such behaviour, making it difficult to impute responsibility. Of course, in knowing about one’s neurological condition, there is the possibility that one may, to a certain extent, take precautions and discipline oneself, in order to prevent one from causing future harms. But this would be difficult if the faculties responsible for exercising precaution and discipline are themselves deficient.

Perhaps neuroscience can be thought of as merely helping us refine our currently esoteric notion of self and agency so as to enable us to make the correct judgments about responsibility. These are the relevant factors that judges and jurors must consider, and this does not exclude neuroscientific data, even if it flies in the face of our intuitions about free will and responsibility. Perhaps neuroscience can establish objective grounds for imputing legal or moral responsibility by demonstrating whether or not a person’s actions was the result of rational agency. Whilst the underlying principles and intuitions concerning justice, blame and punishment may still stand, neuroscientific data may help us properly apply those principles in a consistent and coherent manner. Such is the nature of scientific data that it can often challenge many of our entrenched beliefs, but more importantly scientific data helps us to temper what we accept as factual.

## **Neuroscience and Personhood**

Personhood is a foundational concept central to bioethics. Much of the debate on topics such as abortion, embryos, brain death, organ donation, treatment of non human

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<sup>17</sup> [http://www.timesonline.co.uk/tol/comment/columnists/guest\\_contributors/article2726643.ece](http://www.timesonline.co.uk/tol/comment/columnists/guest_contributors/article2726643.ece)

<sup>18</sup> Damasio H., Grabowski T., Frank R., Galaburda AM., Damasio AR. (1994). The return of Phineas Gage: clues about the brain from the skull of a famous patient. *Science*, 264 (5162): 1102-5.

animals and treatment of vegetative patients, hinges on whether or not we regard the subjects in question as “persons”. The major obstacle that prevents us from reaching a consensus and resolving such issues is the lack of defining criteria for personhood, i.e. necessary and sufficient conditions, despite the fact that it seems intuitively obvious that persons exist. Philosophers have tried to provide criteria for personhood, often appealing to psychological traits such as self-awareness, intelligence and rationality; however, cognitive neuroscientists talk about “central cognition” and “cortical function”, i.e. brain processes. At this stage cognitive neuroscience is yet to fully explain those psychological traits in terms of brain process, however the project is well under way. Lurking in the background of this project is the philosophical problem of whether or not we need either or both types of explanation. Many neuroscientists would expect scientific explanations to take precedence over psychological explanations, hence the challenge is to reduce the psychological explanations to neurobiological explanations, or otherwise eliminate them if a reductive relationship cannot be established.

This neuroscientific/reductionist approach towards understanding personhood is a controversial one. Firstly, the notion of personhood is often characterised by using psychological criteria, which can also be understood as functional criteria, in that each criterion describes a biological function. However this seems inconsistent with our intuitions about whether infants or embryos are persons given that they are yet to develop full functionality that neuroscientists attribute to mature adults. So perhaps describing things in purely functionalist terms leaves out something important. As Derrick Hassert has argued, the neuroscientific reduction of human psychology to brain processes leaves out the importance of the organism as a whole, and that the notion of *soul* is still necessary to help us understand our intuitively broad notion of personhood<sup>19</sup>.

*This author has heard physicians lecture that “the soul” is nothing more than these higher cognitive processes, to which audience members have rightly raised questions such as “what about my uncle in a coma? Does he have a soul?”*

What seems to follow from the functionalist/reductionist perspective is the highly counterintuitive view that patients suffering from neurological damage have in some sense lost their personhood. But a rigorous definition of personhood is required most when the dividing line between persons and non-persons is ill defined and perhaps introducing a term such as *soul* detracts from the actual debate given that the term *soul* falls out of the materialist paradigm that governs the methodology of science. So if it is the case that the notion of personhood is illusory and does not refer to any real category in the world, i.e. personhood is not a natural kind, then the project left for neuroscience in regard to personhood is to explain, in terms of brain processes and evolutionary theory, how and why humans have come to have the very strong intuitions that there are persons in the world<sup>20</sup>.

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<sup>19</sup> Hassert, D. L. (2007) Neuroethics and the Person: Should Neurological Criteria be Used to Define Human Values Ethics and Medicine, 23: 47-55.

<sup>20</sup> Ibid pg. 40

However, as some have argued, there are many concepts that lack necessary and sufficient conditions and hence lack “natural kind” status, e.g. chairs, game and species, but it would be a mistake to think that there are no such things as chairs or games (species is a little more contentious) even though they don’t fit neatly into our notion of a natural kind<sup>21</sup>. Therefore, neuroscience can be viewed as enriching our notion of personhood, demonstrating that it is not an all-or-nothing property but rather a concept more nuanced than previously thought, and perhaps lacking any common essential property. This may suggest that a refined notion of personhood can still serve as a foundational concept, but if so, where does this leave us in regard to issues such as abortion, embryos, death, treatment of vegetative patients, animals? It seems to skew our ethical attitude towards a utilitarian framework, because rather than asking whether an embryo is a person, we can only ask neuroscientific questions about whether embryos have the capacity for self-awareness, intelligence and rationality. However, as Farah and Heberlein rightly point out, we are still left with questions concerning how much weight we give to a being’s “potential” versus “actual” status, and its species membership, amongst other interests. Thus it seems we are left as we were in regard to those bioethical issues.

So perhaps a concept like that of “personhood” in ethics purely serves a pragmatic purpose, given that it’s ontology is controversial, but for those who are less inclined towards a consequentialist ethic, rest assured that neuroscience does not enable us to deduce whether self-awareness, rationality or consciousness ought to be ranked above potentiality or species membership. We decide this for ourselves on other relevant grounds.

## **Conclusion**

Cognitive neuroscience is an emerging field that is increasingly challenging our many entrenched beliefs about how we make decisions, form judgements and particularly what qualifies as legal and moral responsibility. In the end how we respond to neuroscience and how we use this information will not follow directly from the science alone, but will largely depend on the socio-political and philosophical zeitgeist in which society finds itself.

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<sup>21</sup> Churchland, P. S., (2007) The Necessary and Sufficient Boondoggle. Open Peer Commentary in Farah, M. J., and Herberlein, A. S., (2007) Personhood and Neuroscience: Naturalising or Nihilating? *The American Journal of Bioethics*, 7(1):49-76.