Church of Scotland

Church and Society Council

Neurobiology, free will and moral responsibility

Introduction

Do we have free will, or are we just puppets, ultimately controlled by our brains? From the story of Oedipus, a mythical Greek king who fulfilled a prophecy predicting that he would kill his father and marry his mother, and thus brought disaster on his city and family, to the 2002 Stephen Spielberg movie *"Minority Report*", in which the police sought to arrest individuals before they had committed a crime, this is a theme which has raised many questions throughout history.

Neuroscience is a discipline which reveals more about the workings of our brains. Recent technical advances, particularly in being able to produce live images of what is going on inside our head, have given us unprecedented access to our brains. Many things are consequently claimed, some of which appear to support mechanistic explanations (people as puppets, controlled by their brains) against philosophical and theological models of human behaviour in which a person cannot be reduced simply to the material which comprises his or her body.

Although the scientists themselves mostly stress that they are still a long way from true mindreading or prediction, people are impressed by brain pictures. This means that brain scans are being used in areas other than the medical purposes for which they were developed.

What is the science telling us?

There is an important dynamic between science, media and society on the topic of neuroscience and free will. This dynamic is often portrayed in the popular press as pitting mutually exclusive dogmatic positions against each other, often over- or mis-interpreting scientific data in the process.

There is good evidence that neuroscience, and in particular Functional Magnetic Resonance Imaging (fMRI)[1], not only impresses us because of the actual findings and scientific conclusions drawn from them, but because the brain images themselves have enormous psychological power[2]. It has been shown that people are much more likely to accept faulty psychological arguments if they are backed up by irrelevant brain pictures. The commercial use of brain scanning in lie detection is

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[1] Functional Magnetic Resonance Imaging (fMRI) is a type of specialized MRI scan used to measure the hemodynamic response (change in blood flow) related to neural activity in the brain or spinal cord of humans or other animals. Its advantages include its relatively low invasiveness, absence of radiation exposure, and relatively wide availability.

[2] Weisberg, D.S., F. C. Keil, J. Goodstein, E. Rawson and J.R. Gray (2008). "The Seductive Allure of Neuroscience Explanations" *Journal of Cognitive Neuroscience* 20, 470-477. http://www.mitpressjournals.org/doi/abs/10.1162/jocn.2008.20040. See also "Will juries be seduced by brain scans?" http://www.bps.org.uk/news/will-juries-be-seduced-brain-scans

a very profitable field[3], and there have been repeated attempts to get fMRI lie detection into courts (in India with some success). This is worrying, because we simply do not know whether this is appropriate use of the technology. There is also evidence that simply referring to brain images in the summing up of a trial can influence a jury[4].

The physical brain and the mind (defined as being constituted by conscious experience, perception and intelligent thought) are intrinsically associated and interdependent, making (along with the rest of the body) a whole person. However, distinction must be drawn between the physical activity within the brain (measured by fMRI, for example) and the thoughts themselves. While conscious thoughts are embodied in the physical brain processes that reflect the form of those thoughts, as the renowned Scottish physicist Donald Mackay has put it,

> *"this does not mean that our mental activity is identical with the correlated brain activity, or a mere subclass of brain activity … Nor does this mean that the mental is "only an aspect" of the physical, as if the physical were somehow more real and fundamental. The two may perhaps be better described as complementary aspects of our unitary conscious agency."*[5]

Recent advances in our understanding of neurobiology have also raised a number of questions for the Christian faith. Technological advances are proposed to call into question the kind of relationship human individuals have with God, the natural world and fellow human beings. Does what we learn from these approaches challenge our faith? What does it say about our responsibility for our own actions? Would the experience of grace and sacrificial, undeserved love be challenged if neurobiology were to eventually demonstrate that free will does not exist?

This report seeks to address some of these questions in relation to Christian theology. It is important that the church engages with some of the discussions raised by these techniques, and the applications and implications which may be derived from them. In order to address the topic, an expert working group including theological, scientific and philosophical experts was convened. As part of the development of this work, a day conference entitled "It wasn't me, it was my neurons" was organised. For further details, please see www.srtp.org.uk

Observation and measurement of brain activity is not the only area of interest to neuroethics. Advances in our ability to manipulate our brains - whether through pharmacological or other means[6]- have potential ethical implications. However, due to constraints of space, this report will not discuss these issues in detail.

"Taking aim at free will"

Central to much of the discussion in this report will be the concept of free will, which some scientists and philosophers argue does not exist. While scientists have perhaps come more recently to the subject, this has been the focus of much philosophical and theological discussion for millennia.

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[3] For example, at least two commercial companies offer such services in the United States

[4] Weissberg, 2008

[5] Mackay, D.M. (1978). Selves and brains. *Neuroscience*, 3, 599-606.

[6] For example, physical means include trans-cranial stimulation or deep brain stimulation; pharmaceutical means include Methylphenidate, which was developed for use in ADHD. This drug enhances concentration, and is now widely used by students to aid studying.

As described in a recent paper in the scientific journal Nature entitled “Taking aim at free will”[7], there are two main groups of scientific results which have been used to make the claim that conscious will is an illusion:

Readiness potentials and “free won’t”: Experimenters found that the “readiness potential” (when the brain begins to prepare the movement) precedes conscious awareness of the intention to move, seconds before subjects were aware of their decisions[8].

Some conclude from these experiments that our capacity for free will is in the ability to exercise a conscious veto on any unconsciously generated action - so called “free won’t”, thus giving the conscious self the final say in whether an unconsciously generated decision is acted upon.

Unconscious actions: In another series of experiments, subjects who were unaware during the experiment that they were being primed with stereotypes of rudeness (they were told that the experiment was to measure something else) were later more interruptive with the experimenter, while subjects unknowingly primed with images of the elderly while doing a simple task later walked more slowly when leaving the experiment than did subjects in the control group. This type of study seeks to show that subjects know less about the motives of their decisions than they think - that consciousness is not in control of our actions, and we are ignorant of the automatic processes which are really in the driving seat[9].

However, many in the scientific community would draw a distinction between the conscious will being observed in such experiments and the more general understanding of free will. Concerns have been expressed about some of the extrapolations from the relatively simple scenarios played out in these experiments (some involving little more than the moving of a finger or pressing a button) to more complex behaviours.

For millennia, these questions have been of interest for philosophers, theologians, lawyers and the rest of humanity. A central question is the relationship between **determinism** (i.e. that all our decisions are predetermined) and **free will**, and whether or not these are mutually exclusive ideas.

Predictability

The worry of predictability: In the 2002 Hollywood film *Minority Report*[10], scientists are able to predict what people will do, and the police can thus prevent crimes before they have been committed. Potential perpetrators are convicted for thought crimes: even though they did nothing wrong, the police know that this is only because they have been prevented from doing so by their timely arrest.

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[7] Smith, K. (2011) Taking aim at free will. *Nature* 477, 23- 25

[8] Soon, C. S., M. Brass, et al. (2008). Unconscious determinants of free decisions in the human brain. *Nature Neuroscience* 11, 543 - 545

[9] Wegner (2002) *The Illusion of conscious Will*. Cambridge MA, MIT Press.

[10] *Minority Report* is a 2002 science fiction film directed by Steven Spielberg and loosely based on the short story "*The Minority Report*" by Philip K. Dick.

The predictive powers described are a long way from reality, but might scientists in the future be able to predict what we are going to do, before we know it ourselves? And, if we could predict behaviour, would that rob us of our responsibility for our actions? If scientists were able to read our minds and to predict our behaviour, what becomes of moral and criminal responsibility?

If neuroscience could show that the human brain can be completely explained mechanistically, and that there is nothing more to us than the material we are made up of, then many argue that such prediction may be possible.

However, on careful analysis the suggestion is that any perceived threat from neuroscience, if it is a threat at all, is much weaker than assumed. First, it can be shown that the kind of total predictability described in some Hollywood films and some careless science reporting is probably impossible. Belief in total control over human action (termed hard determinism) is not what is at issue in most philosophical discussion over human decisions. Such “soft determinism” is not the same as is assumed in discussion around many neuroscience experiments, which are looking for the physical correlates of decisions. These do not provide categorical conclusions about determinism and free will.

Scots law and responsibility

The relationship between law and society is complex. Those who seek simple solutions have always called for legislation to address any perceived ill; but, although laws may have some effect on shaping the views of society, in the final analysis legislation is effective only if it works with the grain of societal values. This is especially true of common law which arises from within a society and, as it develops, inevitably reflects the zeitgeist of the society in which it is seated. How, then, has the common law of Scotland developed as it grapples with issues of criminal responsibility and the workings of the brain? How is neuroethics likely to be seen through the lens of the law?

Scots Criminal Law has tended to be pragmatic rather than rigorously academic in its approach. This has resulted in a sensitivity to and respect for the common principles on which society operates. However, because the law tends to develop piecemeal, it can be unclear and confusing. This is particularly true of how the law treats accused persons whose mental capacities might be affected by drink, drugs or as a result of their mental condition or personality type.

For a person to be guilty of a crime, there requires to be both an *actus reus* (a wrongful act) and *mens rea* (actual criminal intent). Thus, one who is insane and, as a result is incapable of forming criminal intent, cannot have *mens rea* - hence, the defence of insanity. Equally, automatism (as in sleepwalking) is a defence, as may also be an involuntary action (for example, sneezing whilst driving, causing one to lose control of the car). Or the state of a person's mind may be such that, though not insane, he may nonetheless plead diminished responsibility, for example, by reducing a charge of murder to one of culpable homicide.

The logical end point of this may be uncomfortable. One may drink to such an extent that one has no rational control over one's actions: does that mean that there is no

mens rea? On a strictly scientific view, the answer may be "yes", but were the law to take that attitude the social consequences would be highly undesirable. The attitude of society is that drunkenness should never be a defence because drunkenness is a voluntary condition.

This becomes important when one approaches the problem of the personality disorder of psychopathy. On one view, a psychopath is just made that way; and, so the distinction that one is responsible for one's own intoxication does not serve to prevent the conclusion that a psychopath, who is not responsible for his personality type, may not have *mens rea*. Scots law has firmly rejected psychopathy as giving rise to diminished responsibility. It can be difficult to discern the reason for the distinction between psychopathy on the one hand, and, on the other, mental illness which the law will consider as being relevant in establishing diminished responsibility. Perhaps the distinction arises from the fact that there must be a limit beyond which the law will not go, a point at which the courts say "this far and no further".

This historical experience is important in discerning what the attitude of the courts would be if ever confronted in Scotland by the proposition "it wasn't me; it was my neurons". Quite simply, whatever the scientific evidence might be, that is a place where the law, on policy grounds, would simply not go, else no-one would ever be held guilty of any crime. Even the relatively more modest proposition "it wasn't me, it was my genes" would be likely to be viewed with equal disfavour, and those who are proven to be genetically inclined to crime (which is itself a huge area of scientific controversy) would be likely to suffer the same fate as psychopaths, and for the same reason. The law has to be responsive to societal concerns, and it is likely that it will continue to develop in that way in the future as it has in the past.

A Biblical reflection

Recent advances in neurobiology have raised a number of interesting questions for the Christian faith. Without free will, concepts such as moral responsibility sin, grace and sacrifical love would also be challenged. To reject free will as a human characteristic would mean that individuals could never be held responsible for their actions before society or before God, with huge legal, philosophical and theological ramifications.

Without free will, the essential concept of agape-love could not be expressed. Agape-love is unselfish and reflects a sacrificial giving of oneself to the other. Agape is a love originating in free will. Likewise, without free will, other concepts such as grace and responsibility are also impossible. All these concepts are, in some way, interdependent both in their existence and origin in God. John writes:

> "*Dear friends, let us love one another, for love comes from God. Everyone who loves has been born of God and knows God. Whoever does not love does not know God, because God is love.*"[11]

[11] 1 John 4: 7-8 (NIV)

Thus God is the source of all love and actually *is* love. Moreover, due to the interdependence of love with free will, God is the origin of all free will. For the Christian faith, an understanding of free will and *agape*-love must reach beyond the tangible and into an awareness of, and an interaction with, the loving uncreated God.

From a Christian perspective, there may be no real meaning in free will apart from an awareness of God since free will in human persons was deliberately given by God to enable humankind to love each other and return *agape*-love to God (Colossians 3). Free will is therefore something that cannot just be reduced to science or neurobiology. To reduce human minds to a purely physical concept is to confuse the distinction between the physical manifestation of human thoughts and ideas in the brain, and the thoughts and ideas themselves. What fMRI and related techniques are measuring is physical activity within the brain, not thoughts themselves. There is a difference in kind between the brain and the mind, and any attempt to completely explain mental experiences solely in physical terms is inadequate. In humans, the physical is necessary for the existence and expression of the mental and spiritual. These aspects of the human person are all interdependent and not mutually reducible.

Humans become aware that they are persons by means of the body. The body, in a way, reveals the person. Many influences, both biological and environmental, will have effects on the mental and spiritual capacities and consequently the free will of a person, but free will cannot be reduced to biology or the social environment of a person.

Conclusions

In the last century, neuroscience has made great advances in its understanding of that most complex and fascinating of organs, the human brain. Although there is much neuroscience can teach about physical aspects of ourselves, its contribution to explaining human mentality and spirituality is limited. Theology, philosophy and the social sciences are also essential to elucidate what human persons really are.

As the neurologist William Cheshire explains:

> "*A brain-based neuroethics ultimately is a paper ethics, a morally thin construction that tears under the stress and collapses under pressure. A genuinely human neuroethics, by contrast, rises beyond its stature and reflects a wisdom not entirely its own.*"[12]

It is interesting to notice, in this regard, how offended people become when they are compared to biological robots or puppets. This emphasises how much humans seek value in being able to make free will decisions without being determined by, or reduced to, factors such as neurobiology. Free will defines them for who they are. It gives purpose, meaning and hope.

[12] Cheshire, W (2011) The Origami Brain: From Neural Folds to Neuroethics, Ethics and Medicine 27: 2

A Christian understanding of free will will be informed by the scientific advances in neurobiology while helping to clarify the philosophical and ethical debates regarding freedom, autonomy, sin and moral responsibility. But the Christian characterisation of human persons and their responsibility in this world confers on them a value and dignity, which cannot just be reduced to conclusions drawn from some experiments. Humans transcend the concept of the created universe and physicality and are able to communicate with the uncreated God, the source of all love and free will. This means that the Christian understanding of free will, like *agape*-love and the concept of grace, necessarily involve God's free will, *agape* love and grace. The Christian message of the love of God to humanity gives purpose and hope to human life.

God wants to share this freedom and free will with humankind. God freely chooses to pour out His love into His children who, with the gift of free will, are then able to decide to let this love flow through them towards their fellow human beings. This also enables them to become what they are meant to be and respond to Jesus' instruction:

> *"Love the Lord your God with all your heart and with all your soul and with all your mind and with all your strength,…[and]….love your neighbour as yourself."*[13]

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[13] Mark 12: 30, 31; Jesus quotes from Deut 6: 4,5 and Lev 19: 18