

Neuroethics and Free Will

Neuroscience strives to understand the biological underpinnings of human behaviour, and occasionally this research radically changes our understanding of a particular phenomenon. I argue that advancements in neuroscience are currently threatening our notion of free will. In this paper, I will explore research of the neural correlates of three important aspects of free will: (1) decision making, (2) moral responsibility, and (3) consciousness. I will then highlight the importance of a fundamental assumption of free will in our society, and what neuroethical action can be taken to facilitate a future change in the public's understanding of free will.

One of the hallmarks of free will is our ability to make autonomous decisions. Sanfey et al. (2003) were interested in the neural correlates of decision making in the ultimatum game. Their study highlighted the anterior cingulate cortex and dorsolateral prefrontal cortex as regions of interest when replying to fair or unfair offers. Bechara et al. (1999) famously used the Iowa Gambling Task to illuminate how the amygdala and the ventromedial prefrontal cortex are involved in aspects of risky decision making. These studies seem to suggest the possibility of one day mapping out the neural correlates of human decision making.

Another component of free will is the ability to perform moral evaluations of a situation. However, Haidt et al. (2008) has shown that sometimes our moral judgements can be swayed. Using a series of disgust-inducing paradigms, the researchers found that there was a strong relationship between the severity of a moral judgement and the feeling of disgust. Relatedly, Greene et al. (2001) found that the medial frontal gyrus and posterior cingulate gyrus were correlated with "moral-personal" emotional decision making. These studies demonstrate that our moral judgements are systematically calculated based on salient emotional cues, and can be linked to distinct regions in the brain.

Most importantly, our perception of free will hinges upon our understanding of consciousness and self-awareness. Doesburg et al. (2011) used binocular rivalry experiments to demonstrate that the conscious awareness of a percept switch involves gamma band synchronization that oscillates at a theta rhythm in the prefrontal and parietal lobes. Alternate states of consciousness, like mind wandering, have also been researched and attributed to the default network regions (Christoff et al. 2009). Despite its historical elusiveness, these studies demonstrate that it is possible to investigate the neural underpinnings of consciousness, and that our understanding will only become more comprehensive as our body of knowledge increases.

The fundamental assumption of free will is integral to the way our modern society is run. If we adopt a deterministic understanding of human behaviour, we could no longer hold anyone legally responsible for their actions. Their crimes would simply be a predetermined product of all events that

came before, and the success of any form of future rehabilitation would be equally as calculated. Additionally, moral evaluation would be abandoned, since we could no longer condemn negative actions or praise positive action. This could potentially have cascading effects that manifest at both the individual level (how people behave) and societal level (how entire communities make decisions).

With that said, neuroscience research still has a long way before we are forced to accept a strictly deterministic picture. Nevertheless, it would be wise to institute a neuroethical strategy to facilitate a large-scale change in the public's view of free will. I feel it is imperative to implement a strong multidirectional relationship between the research community, the media, and the general public. In the past, the dissemination of research findings has been limited to the media's interpretation of publications with minimal interaction with the research community, which could lead to the misinterpretation and over-exaggeration of findings by the public (Racine 2005). By involving all three parties in the conversation, the media and public could increase their awareness of the limitations of neuroscientific findings, meanwhile the research community can gain a better understanding of how their findings impact the rest of society. A multidirectional relationship would facilitate a gradual introduction to the general public about topics pertaining to free will, and equip them with the analytic tools needed to evaluate the relevance of the findings for themselves.

In conclusion, neuroscience research in decision-making, moral judgement, and consciousness is quickly uncovering a detailed map of human behaviour, at the consequence of our current understanding of free will. A change in the public's view of free will could have radical implications on our society, so it is important that we have a neuroethical strategy in place as an anticipatory measure.

References

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