

Right and wrong in neuroscience psychology essay



**ASSIGN
BUSTER**

Neuroimaging is securing images of the brain for conducting advanced medical diagnosis.

Neuroethics as a subject matter has resulted from (an evolving) relationship between bioethics and neuroscience of which neuroimaging forms a crucial part. There has always been a need to establish the fact that ' Brain' is different to ' Mind'. Neuroscientists believe that while ' Brain' is the vehicle, ' Mind' is the driver.

Several Neuroimaging techniques seem help establish this fact. However, such an endeavor has promoted a debate among scientists and ethicists relating to potential discrimination among humans. There has to be a partnership between the bioethicists and the neuroscientists in order to deal with these ethical issues and find a way to make good use of this remarkable technology.

Introduction

Neuroethical debate has been around for a while, more since advanced neuroimaging techniques have come to play in the field of medicine. Newer dimensions in this debate are surfacing with further maturing of neuroimaging techniques. Results from these new Neuroimaging techniques are leading to advanced interpretation of the human brain like never before. These interpretations are leading to ethical debates around how these results can be put to use. Under the pretext of ' Brain mapping', there are evolving dangers of intrusive psychological assessment being imposed on a common man.

Emergence of advanced Neuroimaging techniques is seen by social circles as a source of undue influence on human ethics. Following discussion, attempts to put this debate in perspective.

What is Functional Neuroimaging?

Functional neuroimaging is the use of neuroimaging technology to measure an aspect of brain function, to understand the relationship between activity in certain brain areas and specific mental functions. It is primarily used as a research tool in cognitive neuroscience, cognitive psychology, neuropsychology, and social neuroscience.

Functional neuroimaging draws on data from many areas other than cognitive neuroscience and social neuroscience, including biological sciences, physics and maths, to further develop and refine the technology (Wikipedia).

What are the most popular neuroimaging techniques in the world today?

Functional Neuroimaging tools available today include ElectroEncephaloGraphy (EEG), MagnetoEncephaloGraphy (MEG), Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT) and functional Magnetic Resonance Imaging (fMRI) (Illes & Racine 2005) with varying inherent strengths and weaknesses. However, the intention of this paper is not to compare these tools from an imaging capability perspective but to get a view of the host of ethical issues their capabilities either lead to today or could potentially lead to in the future.

It may be interesting to note that neuroimaging as a subject of interest has been around for a while as substantiated by the fact that the earliest attempt to image the brain dates back to 1929 (Karbowski 1990). The EEG was the first tool to be able to monitor the brain in near real time.

fMRI is the most widely recognized tool today. This is mainly because MR scanners are widely available and the public is familiar with the concept of MRI. It has no harmful radiation, it is noninvasive and it produces high resolution images. But it also has its limitations. The cost to run an MRI scan is high and only a trained professional can run one (Illes & Racine 2005).

What are the typical applications of these neuroimaging tools and how do they lead to ethical issues?

Each of the tools monitor a certain condition within the brain like metabolic activity, blood flow, regional oxygenation etc. They are also used to map areas prior to surgery in cases of epilepsy, tumors etc. Recently there has been an attempt to use it when diagnosing Alzheimer's disease and other mental illnesses (Illes et al. 2003). Fetal MRI has been able to show various anomalies to the central nervous system. fMRI has also been able to determine level of consciousness in a person. Other than neuroscientific uses, there have been experiments to help determine factors like motivation, reasoning, attitude etc. (Schiff et al. 2005)

The use of fMRI has been expanding steadily. It has been used in studies regarding lies and deception, brain difference in violent people compared to normal people, variability in brain developmental patterns (Illes et al. 2003) and there has even been an attempt to probe religious experiences (Curran <https://assignbuster.com/right-and-wrong-in-neuroscience-psychology-essay/>

2003). But since all these profiles are so deep, they are hot topics for neuroethical discussions.

One of the most intriguing recent neuroimaging applications has been in the area of ' Brain Mapping' which is done through fMRI. The end result is a colorful map of the brain which is capable of diagnosing various conditions like stroke, cancer, seizures, dementia etc. (Illes & Racine 2005).

Another application called ' Brain Fingerprinting' is being promoted to determine whether a person is in possession of information or not. When the person comes across the relevant words or pictures, brain wave responses are triggered and these can be measured. This can then be used to determine whether the information is stored within the brain (Farwell and Smith 2001).

More recent applications of these tools point towards managing Law and Order in the society. There have been court cases where Brain Mapping reports were required as evidence. These new applications have the potential to change approaches with regard to lie detection (Illes & Racine 2005). Langleben et al. concluded that: ' It takes more mental energy to lie than to tell the truth' . We are able to record activity within the brain but are unable to determine if it is positive or negative energy. It may well be that, in the near future, we will be able to determine whether deception is premeditated (Illes & Racine 2005).

Since the introduction of these technologies, defendants began to argue that psychiatric assistance for criminals needs to include a thorough neurological evaluation. Studies have shown that murderers have poor functioning of

prefrontal cortex (Raine et al. 1994). However, question remains whether this sort of evidence can be adequate to convict a person (Illes & Racine 2005).

Interestingly, the most recent non-scientific applications as described above are leading to an ethical debate under categories mentioned in the following section.

What are the key ethical issues?

There are at least five key ethical issues and a whole host of related peripheral issues that emanate from the discussion above.

1. Discrimination

The most common fear related to neuroimaging is that companies can potentially use it as justification for denial of health insurance, employment and even financial loans (Clayton 2003). Even though it is not considered a major threat yet, little stands in the way for similar concerns to emerge. Currently, there is a healthy regard for the breadth of information that can be delivered about a person, but the application of neuroimaging techniques threaten to test new levels (Illes & Racine 2005). Some questions that help determine the ethical perspective include: How far will someone go to avoid imaging if their education or career is at stake? How can it be used advantageously? Can Canli's paradigms for imaging be used for weaker minded people (Canli & Amin 2002)? Can information be used harmfully?

A proposed theory by Golby et al. (2001) is that we study the attitude of applicants to determine eligibility to become police officers, leaders, teachers etc. but is such screening useful allocation of funds?

However the challenge here is one of human interpretation of data and inaccuracies in this process could lead to undesired results (Weir et al. 1994).

2. Non Compliance

Individuals and experts in possession of medical information are required to comply with body of laws and regulations which are intended to protect the privacy and related interests of the person whose information is in question. Failure to comply with these obligations can be regarded as being unethical as the volunteers are placed at unnecessary risk (Kulynych 2002).

Recently there have been complaints by subjects who have suffered adverse effects because of poor conduct on the part of the researchers (Kulynych 2002).

3. Privacy of Thought

Neuroimaging tends to challenge privacy of human thought. Information regarding our thought process can be considered to be very 'intrusive' and could lead to major ethical concerns (D'Esposito et al. 2003). Should a third party just be able to intrude into a person's thought and find out everything about them? Neuroimaging seems to assist exactly that as compared with other 'non-intrusive' techniques of 'psycho-analysis' that exist today (Illes & Racine 2005).

A person's thought process depends on the culture and the environment the person is familiar with (Dumit 2004). Hence, the 'brainome' (Mauron 2003) is dependent on our environment and it makes us who we are. If information about the brainome can be ascertained, then any third party could potentially come to know everything there is, about a person leading to unfair consequences.

4. Genetic Influence

Genetic information is a definitive form of health data. People accept the inevitable when it comes to genes as they believe they are born a certain way (Clayton 2003). There have been reports which state that there are genes for violence, alcoholism, language etc. (Mauron 2003).

Empirical evidence suggests that certain intervening external factors like culture and environment tend to influence our behavioral patterns to some extent (Ward & Frackowiak 2004). Our DNA accounts for some of our raw thoughts but the way they are processed depends on how the brain has been 'shaped'. The relationship between the brain and self is much more direct than the relationship between genes and personal identity (Mauron 2003). We cannot say that neuroscience is 100 percent deterministic but it accounts for the bulk of our actions (Illes & Racine 2005).

5. Disease predictability

Access to the new age neuroimaging techniques are leading to improved diagnosis and pathology. This could lead to situations where an individual can easily discover that he or she has been infected with a disease which

was not previously possible. It may no longer be just the privileged who gain access to such information (Illes & Racine 2005). If the diagnosis is positive and the disorder is curable, then it is not a major issue. But for the non curable ones, such an incidence could lead to ethical, social and professional challenges for the person leading to other ethical consequences such as discrimination and unfair treatment.

6. Interpretation

Careful interpretation of data is crucial when it comes to neuroimaging. Scientists are looking for interpretation models to eliminate inaccuracies. (Illes & Racine 2005).

Brain maps can be understood by anyone but the process involved in making one is really complex and depends entirely on the interpreting scientist. In the absence of a standard protocol, it is difficult to draw conclusions (Kulynych 1997). The conclusions are drawn based on what scientists think. A good example from the past is when different scholars put forward different models of the brain based on what they believed (Illes & Racine 2005). Each culture defines 'self' differently (Morris 1994) (Taylor 1989).

It has been proposed that we adopt computer metaphors, neural networks or other models to interpret data but even writing programs involves the use of a person's brain (Illes 2002).

Another fear that cultural workers have is that the meaning of spirituality could be changed if the operation is successful (Global News Wire 2003). Not only does culture penetrate neuroimaging but neuroimaging is increasingly

penetrating culture. So, the neuroscience of ethics needs to be considered alongside the ethics of neuroscience (Roskies 2002).

Dealing with the challenge

This paper has looked into the many ethical problems which are present today but how do we deal with them? Neuroethics needs to address the challenge of interpretation in great depth. Imaging is being looked upon as the future of investigations. This needs to be done acceptably and the data needs to be kept confidential. The big companies should only get access to data which they have permission to.

Discussions need to take place regarding different peoples views. All fields have to be looked into like morality, emotions etc. The public needs to be kept up to date regarding research so they will feel secure. The new generation of scientists and ethicists need to be focused on examining the limits of imagery (Racine & Illes 2004), public perspective on these issues etc. Bioethicists will have to work as facilitators when different groups meet and contribute (Illes & Racine 2005).

Bioethicists and neuroscientists will have to work together to understand this concept and its effects. When this technology is perfected, the impact on the world will be significant.

Research Methods

A Google search on neuroimaging and neuroethics produced a wide range of sources including various journal articles and suggested readings which were

<https://assignbuster.com/right-and-wrong-in-neuroscience-psychology-essay/>

consulted. I mainly based this essay on the paper by Illes & Racine from 2005.