

# The role of personality and personal identity in DBS

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The 21<sup>st</sup> century is often called the age of neuroscience. This new field is indeed today one of the most promising areas of science. The basic goal of neuroscience is to contribute to a better understanding of the human brain's functioning in order to find new ways to prevent or cure neurological and psychiatric disorders. For instance, initiatives like the Human Brain Project (HBP), funded by the European Commission and coordinated by the Federal Institute of Technology of Lausanne, aims to create a computational simulation of the brain to better understand its activity and the neuronal interaction [1].

New neuroscientific technologies, which enable a deeper insight into mental states, range from electroencephalography (EEG) and magnetoencephalography (MEG), to structural and functional magnetic resonance imaging (MRI and fMRI, respectively). But, as we learn more about the brain, we also learn more about human intentions and motivations. This new knowledge about our inner life is of great relevance to ethics and law, given that people's intentions and thoughts play an important role in moral and legal assessments of personal responsibility. Some scholars even claim that the increasing use of neuroscientific techniques will challenge traditional moral concepts such as personal identity, free will and consciousness [2].

This viewpoint aims to discuss some of the ethical implications of a neuroscientific intervention called Deep Brain Stimulation (DBS). This procedure has been used over the last decade as a standard treatment for Parkinson's Disease (PD) but the number of indications is steadily increasing [3].

DBS basically consists in the surgical insertion of electrodes deep into the brain. The electrodes are connected to a pulse generator, which is placed in the chest region below the collarbone. The device generates electrical pulses that stimulate a certain brain area, altering its patterns of functioning and alleviating the disease's symptoms (e.g., tremors). The procedure has been called a "pacemaker for the brain" [4]. Although in many cases it is a successful technique, one should not overlook the fact that it is also an invasive and chronic intervention. Furthermore, the accidental stimulation of adjacent brain regions might result in some side-effects, like speech dysfunction or reduced working memory [5]. This spillover could also lead to personality changes like hypersexuality, aggressiveness, disinhibition [6], apathy or even depression [7]. Depending on the individual and on the brain area that has been stimulated, these side-effects might be slighter or stronger.

Although patients undergoing surgery tend to be mainly afraid of surgical complications, one of the aspects of DBS that most concern physicians are personality changes. A survey made among experts on DBS shows that more than 40% of them considered that the stimulation was a more likely cause of personality changes than changes in medication [6].

These personality changes could have a serious impact on the everyday life of the patient, including conflicts in the family and at work. Moreover, it should not be excluded that severe alterations in the personality can even lead to violent behaviour. The question that naturally can be raised in such a situation is: Is the patient really responsible for the harm caused to others? Could he not argue: "It was not me! It's the device in my brain that made me do it!"? The ground of this concern is that probably the patient would not have committed that crime if he or she had not suffered a personality change as result of the DBS. Legal systems do not have yet specific rules to deal with these new dilemmas that result from neurotechnologies. Nevertheless, a possible alternative would be to apply by analogy the criteria currently used for crimes committed under the influence of medication, or by individuals suffering from Multiple Personality Disorder (also known as dissociative identity disorder, DID). In these two situations, the individual experiences a psychological discontinuity of memories, intentions, beliefs and decisions. Similarly, in some cases of extreme personality changes due to DBS, it could also be argued that the individual did not act rationally, and rationality is the main legal requirement for criminal liability. On account of that, if a defect on an individual's mental capacity affects his or her capacity for acting rationally, he or she could be held not (fully) responsible for the unlawful act [3].

Another possible side-effect of DBS is that, in some cases, even though from a clinical point of view the intervention could be regarded as successful, patients might be deeply unhappy with the result because they can experience a feeling of alienation. The literature shows that it is not infrequent to listen from DBS patients statements like "I do not feel like myself anymore", "I feel like a robot" or "I have not found myself again after the surgery" [4]. It must be noted that the problem does not consist here in any "personality change" that is clearly perceivable by others, but in the subjective feeling of being *another* person.

This leads me to the main issue I would like to address in this viewpoint. Although the concepts of "personality" and "personal identity" are often used as synonyms

in the ethical debate about DBS, I think they must be distinguished for a more accurate analysis of the issues at stake. No doubt that these two notions are close interrelated, and can sometimes even overlap. However, they relate to two different facets of the person.

On the one hand, *personality* can be defined as the sub-set of features that characterize an individual in the way he or she is, these traits enable to differentiate one person from another. Therefore, if the stimulation has an altering effect on those features, the individual's personality could be threatened. However, not any variation in the person's features would imply the occurrence of a personality alteration, because this latter would require an alteration in the core attitude of the patient [7]. That is to say that the main traits, which define externally who someone is, may no longer exist or might have been replaced by other features. This would be the case, for instance, if someone who had always behaved prudently and calmly suddenly shows an agitated, aggressive and reckless behaviour.

On the other hand, *personal identity* is a wider concept which results from the self-narrative of the person; it is the image that individuals have of themselves and of their lives. Therefore, the concept of identity is not a static, but a dynamic one. It is indeed not feasible to isolate socio-professional factors from the process of identity configuration, because experiences and personal relationships do play a role in this shaping process. Hence the image that a person may have about him or herself is also partly forged by the conception that others bear in mind about them. On this ground I do agree with the suggestion made by Françoise Baylis that personal identity should be considered as a dynamic and relational concept [5]. While tackling identity in this paper and the possibility of its impingement by DBS, I refer only to the *qualitative identity*. As numerical identity entails fusion between the physical entity (the person per se) and his or her traits, it would be pointless to claim that this identity could be affected by a DBS intervention [8]. The patient in no case would be replaced by another patient, no matter how alienated he or she could feel. He or she might have the subjective feeling of being another person, but metaphysically speaking, he or she is still the same individual. The alteration would be in their qualitative identity, in the sense that their cognition, motivations, behaviour or values might change.

Based on the notion of a relational and dynamic concept of identity rather than on a static one, I would like to pinpoint the report by Françoise Baylis about her meeting with the German sociology professor Helmut Dubiel, who described in a book the course of his life with Parkinson's Disease [5, 10]. Mr. Dubiel underwent DBS therapy in order to treat his severe disease, which for him was a very dramatic event in his life and even a source of stigmatization. As a side-effect of DBS, he suffered from a speech dysfunction and was not able to deliver the same good lectures anymore, because the

volume of his voice was too low and his articulation became poor and slurred. This fact greatly affected his self-confidence and self-perception, as well as his social interactions with his peers. In other words, the speech dysfunction was a negative impingement on Dubiel's personal identity.

Two conclusions can be drawn from this case. Firstly, Dubiel's personal identity was affected by a side-effect, which was not directly a personality alteration. In principle, the set of features which characterized his personality did not undergo any change as a consequence of DBS. Nonetheless he did not feel the same anymore, and hence his self-narrative radically changed, and also his interaction with other people. The impairment of not being able to talk as he used to before made him feel alienated and inauthentic. This is interesting because it shows that despite the closeness between the concepts *personal identity* and *personality*, they are not identical. DBS can provoke personality changes, but also an impingement on identity without an accompanying alteration of personality.

Notwithstanding, given that each patient has different life circumstances, they do not suffer the side-effects in the same way. In the case of Dubiel, a speech dysfunction had the effect of impinging his personal identity. But perhaps on another person who performs a different task in life or is engaged in different types of personal interactions, this side-effect may not have a significant impact on his personal identity.

This first conclusion leads me to another question: is this identity impingement a direct result of DBS, or is it instead just a maladaptation to it? [9] This is a crucial question because the latter perhaps could be resolved with an appropriate and accurate multidisciplinary psychological follow-up. But the former would pose the question of whether the DBS per se could suppose a fundamental threat to personal identity. In this regard, it is worthy of note that, although implanting electrodes deep into the brain marks a milestone in the patient's life, the initial detection of the disease also represented a pivotal moment for him/her as well. As Mr. Dubiel describes in his book, he changed radically after the diagnosis of the disease. Although his human physiology did not suffer a change, he needed to adjust to a biorhythm which was totally unpredictable due to the malady and the required medication. His constant tremor and dyskinesia made him feel as if he would not have any autonomy, and he became estranged from his colleagues. Finally, the DBS operation restored his mobility and his physical autonomy, albeit as his speech became impaired, he had the feeling that the intervention had just replaced one set of symptoms with another, and he felt anyway alienated [10].

This argument makes me consider that the impact of DBS on personality and personal identity could be a combination of side-effects and adaptation to DBS. Something that should not be forgotten is the fact that individuals, once hindered by the symptoms of their

particular illnesses, must assimilate a new health status following the stimulation. As a consequence, it would be an issue of utmost importance to take care of patients in order to help them to cope with the sudden changes in their lives.

In Dubiel's case, although he suffered important side-effects at the beginning of the therapy, with the passage of time he learned how to adjust the device's amplitudes in order to deal with these unwanted effects. If he needed to enunciate clearly, he took the determination of setting a lower amplitude on the device, accepting that this action would lead to relative immobility. On the contrary, he could set a higher amplitude for walking, although his speech at that moment might turn out impaired. This way of dealing with the amplitude of the stimulation, depending on the specific needs of each patient, made me consider the varied nature of personal identity changes. As the self-narrative and self-perception of the patient is highly shaped by socio-contextual factors, technology might be just an additional element in this context. Following this reasoning, one of the crucial aspects of an ongoing DBS would be to help patients to feel comfortable with the device as a new part of their identity.

In conclusion, when discussing about the side-effects of DBS, it is important to consider their impact on the personal dimension of the patient. Moreover, it seems crucial to me to distinguish between the concepts of *personality* and *personal identity*, and to show that the

latter could be impinged by the use of DBS without the occurrence of an alteration on the former.

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#### References

1. Human Brain Project. Available at: [www.humanbrainproject.eu](http://www.humanbrainproject.eu) (accessed 30/08/2016).
2. Greene J, Cohen J. For the law, neuroscience changes nothing and everything. In: Illes J, Sahakian B (eds). *The Oxford Handbook of Neuroethics*. Oxford: Oxford University Press; 2001, p. 655–674.
3. Klaming L, Haselager P. Did my brain implant make me do it? Questions raised by DBS psychological continuity, responsibility for action and mental competence. *Neuroethics*. 2013;6(3):527–39.
4. Johansson V, Garwicz M, Kanje M, Halldenius L, Schouenborg K. Thinking ahead on DBS: an analysis of the ethical implications of a developing technology. *AJOB Neuroscience*. 2014;5(1):24–33.
5. Baylis F. I am who I am: on the perceived threats to personal identity from Deep Brain Stimulation. *Neuroethics*. 2013;6:513–26.
6. Christen M, Ineichen C, Bittlinger M, Bothe H, Müller S. Ethical focal points in the international practice of Deep Brain Stimulation. *AJOB Neuroscience*. 2014;5(4):65–80.
7. Witt K, Kuhn J, Timmermann L, Zurovski M, Wooper C. Deep Brain Stimulation and the search for identity. *Neuroethics*. 2013;6:499–511.
8. Unterrainer M, Oduncu F. The ethics of deep brain stimulation (DBS). *Medicine, Health Care and Philosophy*. 2015;18:475–85.
9. Mecacci G, Haselager P. Stimulating the self: the influence of conceptual framework on reactions to Deep Brain Stimulation. *AJOB Neuroscience*. 2014;5(4):30–9.
10. Dubiel H. *Deep in the Brain. Living with Parkinson's Disease*. New York: Europa Editions; 2009.