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can complement the discourse to better understand underlying assumptions, beliefs, and values. Ultimately, this will allow a more nuanced view on normative evaluations of clinical scenarios.

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Adverse Psychological Effects to Deep Brain Stimulation: Overturning the Question

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DISEMBODIED MINDS, INTELLIGENT BODIES

Mecacci and Haselager (2014) argue that human beings tend to think of themselves as “disembodied minds.” We are intuitive Cartesians, the authors contend, either because we are culturally led to embracing body–mind dualism, or because our cognitive system is so hard-wired (the Cartesian mind–body dualism is discussed in Pardo and Patterson [2013]).

We shall not argue against this conjecture, which has been advanced by other scholars (Bloom 2004, cited in Mecacci and Haselager 2014) and is indeed close to our own intuition. One may, in fact, go even further, and

hypothesize that human beings are alarmed and destabilized by the very fact of becoming aware of the sophisticated, complex, and apparently fragile biological mechanisms that make it possible for us to function normally.

In the *Confessions of Zeno*, Italo Svevo thus describes the psychological reaction of the young, healthy Zeno to a conversation with his friend Tullio, who walks with a limp:

Tullio and I began talking about his illness. . . . He told me in amusement that when one is walking rapidly each step takes no more than half a second, and in that half second no fewer

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than fifty-four muscles are set in motion. I listened in awe. I once directed my attention to my legs and tried to discover the infernal machine. . . . I could not of course distinguish all its fifty-four parts, but I discovered something terrifically complicated which seemed to get out of order the instant I begun thinking about it. I limped as I left the cafe, and for several days afterwards walking became a burden to me, even causing a certain amount of pain. (Svevo 1958, 83)

The very surfacing to our consciousness of our corporeal mechanisms thus appears to have destabilizing potential. For example, reading medical information over the Internet is known to trigger health fears, a phenomenon known as cyberchondria (Aiken et al. 2012; White and Horvitz 2009). The ability to organize and plan one's time and activities in accordance with one's physical needs is acquired relatively late in life, and it comes with experience, possibly because it is, to some extent, counterintuitive. In conclusion, we postulate that human beings have the tendency to, and like to, think of themselves dualistically, as disembodied minds and intelligent bodies. We take for granted our body's ability to self-regulate and to create the necessary conditions for the appropriate functioning of our mental life, and we tend to function better if we are not conscious of how exactly our body operates.

IS THE PSYCHOLOGICAL SUFFERING OF DBS PATIENTS REALLY TO BE ATTRIBUTED TO A CONCEPTUAL FRAMEWORK SHIFT?

The authors argue that adverse psychological reactions to DBS may be connected with the fact that the patient experiences a shift from his or her (innate or culturally acquired) Cartesian mind-brain conceptual framework, to a brain-centric materialistic scheme that, according to Mecacci and Haselager, may be psychologically unsettling.

This is an intellectually stimulating and thought-provoking hypothesis, but we do not find ourselves in agreement with it. We think it could be tested empirically, through studies on pharmacologically treated psychiatric patients (e.g., severely depressed patients), observing the patients' intuitive conception of the mind-brain relationship and their psychological reaction to treatment with medications. We would expect to find that pharmacologically treated patients interpret their suffering as purely existential rather than biologically based, thus embracing Cartesianism at an intuitive level. However, we would also expect to find that when (and if) medications make them feel better, patients tend to be happy and satisfied, even though the fact may force them to abandon their Cartesian intuitive conceptual framework in favor of a brain-centric materialistic scheme. There is probably no relationship between the patient's mind-brain intuitive conceptual framework and his or her psychological adjustment, or lack thereof, to medical treatment directly affecting the functioning of the brain.

We think it rather likely that DBS tends to involve more psychological maladjustment than pharmacological

treatment alone, but we would attribute that to the higher invasiveness of DBS, which entails both traditional surgery to implant electrodes in the brain and frequent electrical stimulations directly to the brain. We postulate that the more invasive the treatment, the more difficult it is for the patient to adjust to it, physically and psychologically. We further think this is to be attributed to the more radical alteration of the extremely complex physiological balance on which the human body rests, an equilibrium that results from millions of years of evolution, and whose processes and operation are known only partially by contemporary medicine and science.

This is not to deny that the patient's discomfort may be partially imputable to cultural factors as well; however, rather than calling into question the conceptual framework of the mind-brain relationship, we would formulate a different conjecture. Patients may be wary of direct physical interventions on the brain, because of the recent history of psychiatry. In the 1960s and 1970s, electroshock and direct physical interventions on the brain (known as "psychosurgery") on institutionalized patients have been exposed as systematic abuse on defenseless human beings, as they were indeed often carried out in forms and manners and contexts where they constituted torture (or, at best, experimentation) rather than treatment (Shorter and Healy 2007). Could this not have led to relatively widespread negative preconceptions regarding the use of direct electrical stimulation to the brain as a form of medical treatment?

PHYSICIAN, HEAL THYSELF

Mecacci and Haselager argue that doctors tend to pass along to DBS patients a braincentric, materialistic account of the mind-brain relationship. This thought-provoking hypothesis could be tested through qualitative studies with doctors and patients, exploring the style and content of their communication with patients and their metaphysical assumptions concerning the mind-brain relationship. We do not believe we would find that doctors endorse braincentric materialism; nor would we expect to find that they pass such a view along to the patient. To our knowledge, no such study has been carried out yet; however, based on Moratti's research experience in medical decision making in various countries, we would expect most doctors, at least certainly Dutch doctors (we mention this because Mecacci and Haselager are affiliated with DCCN, a Dutch institution), to be making active and constant efforts to avoid coaching patients into a particular metaphysical view (Moratti 2010a). If any such view is nevertheless passed along implicitly (Moratti 2010b), it is probably close to Clark's extended cognition approach: Human intelligence is partially embedded in the external world, and both constrained and supported by the ecological and technological surrounding resources; technological artifacts thus become a constitutive part of our selves (Clark 2003, cited in Mecacci and Haselager). Mecacci and

Haselager suggest Clark's framework could be less destabilizing to patients than braincentric materialism; however, we submit that it is a materialism, too, although not braincentric.

We would like to make two more remarks in this regard. Doctors are subject to the same cultural influences, and endowed with the same cognitive apparatus, as anyone else; if we all are intuitive Cartesians, why should doctors be braincentric materialists? We can here make two hypotheses. If the Cartesian framework is brought about by Western culture, medical training drives deep-seated Cartesian cultural influences out of doctors. If the Cartesian framework is hard-wired in the cognitive structure of human beings, medical training modifies doctors' cognitive structure to a very profound level. The latter contention seems to us difficult to support, but we do agree that education may change people's intuitions; however, we look forward to seeing more evidence and arguments to support it.

We also submit that if the tendency to perceive oneself as a "disembodied mind" is not culture-dependent, but rather deeply entrenched in human cognitive mechanisms (Bloom 2004, cited in Mecacci and Haselager), we do not see how cultural changes (including a change in communication with doctors) could modify it.

OVERTURNING THE QUESTION

We believe the key issue here is not why patients react adversely to an extremely invasive procedure. Indeed, it is to be expected that patients could not possibly want and therefore would not accept such a very disruptive interference with one's sense of self and ability to control one's mind. What needs to be clarified instead is how, when, and why some patients eventually do adjust well to DBS psychologically. It would be desirable, we believe, to carry out studies on this group of patients alone, which, we would be inclined to speculate, are a relatively rare exception among people who have undergone DBS. How invalidating was their symptomatology before DBS, and how did DBS impact on their quality of life? What type of considerations did they make when deciding to undergo DBS, and why exactly did the treatment meet their expectations?

Finally, a purely ethical consideration: Psychological maladaptation, shown to be rather frequent by the research cited in Mecacci and Haselager, should be regarded as an expected, potential and serious side effect, and weighted against potential treatment benefits. Under which circumstances does it become morally acceptable for doctors to suggest DBS? When can DBS be reasonably, realistically expected to lead to an actual improvement to the patients' overall condition and quality of life?

Important ethical and societal challenges exist in the current and extending practice of DBS (Bell, Mathieu, and Racine 2009; Johansson et al. 2014). We would consider it opportune to exercise great caution when offering highly invasive treatment. The central ethical imperative guiding the medical profession is *primum non nocere* (first, do not do harm [to your patients]), and the patient's right to physical and psychological integrity must always be taken very seriously, no matter how severely compromised his or her condition (Beauchamp and Childress 2008).

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