Does Belief in Dualism Protect Against Maladaptive Psychosocial Responses to Deep Brain Stimulation? An Empirical Exploration

Jason Shepard & Joshua May
a Emory University
b University of Alabama at Birmingham
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PLEASE SCROLL DOWN FOR ARTICLE
Mecacci and Haselager (2014) offer several interesting hypotheses about the negative psychosocial side effects of having an electronic device implanted in one’s brain via deep brain stimulation (DBS), such as feeling like a different person or a machine. The authors argue that one’s beliefs about the relation between the mind and the body (e.g., dualism vs. materialism) can promote or attenuate such “psychosocial maladaptations.” One of their core hypotheses is that a belief in dualism protects against these effects, since “the stimulations will not touch one’s ‘genuine self’” if one believes “the brain is not involved in the very nature of your mind and self” (31). On the other hand, Mecacci and Haselager claim that a belief in “neurocentric” materialism may lead one to “feel exposed to a personal disruption, for a stimulator interferes with what is responsible for the entire personal dimension, the brain” (31).

If Mecacci and Haselager are right, people who accept dualism should (a) be less likely to view DBS as a threat to personal identity, (b) be more comfortable with DBS in general, and (c) not see DBS as a procedure that would make people “less human.” These views, if true, are likely to hold for DBS patients as well as the general public. For example, non-DBS patients who are dualists should see DBS as less of a threat to personal identity than materialists would.

While we believe Mecacci and Haselager’s hypothesis is plausible, an opposing view also seems plausible. For example, dualists are more likely to believe that we have a special essence, or a soul, that makes us us (Bloom 2004), and they may view the brain as a place where the soul interacts with the body (Descartes 1641/1996). This view may lead dualists to be particularly wary of DBS, fearing that DBS will interfere with the soul via its connection with the brain. Materialists, on the other hand, will be less likely to believe that people have soul-based special essences, and thus materialists may be more comfortable with DBS, precisely because they are less inclined to believe there is an essence to be manipulated (cf. Nahmias, Shepard, and Reuter 2014).

Of course, the competing predictions made by these hypotheses are an empirical matter, not merely a conceptual one. Mecacci and Haselager appreciate this point as much as anyone. They specifically note the dearth of empirical research on this topic, and one of the goals of their paper is to “[make] a case for further empirical investigation” (31). We do exactly that, reporting a study that we hope will serve as a starting point for a developing empirical debate.

**METHOD**

We recruited 82 people via Amazon Mechanical Turk to participate in the study. Participants were administered the Free Will Inventory (FWI; Nadelhoffer et al. 2014), which includes a (belief in) Dualism subscale. They were then asked to read a short passage introducing the uses and effects of DBS, followed by a questionnaire regarding DBS and personal identity, which contained 16 questions. Participants responded to all questions using a 7-point Likert scale ranging from 1 strongly disagree to 7 strongly agree.

The 16 questions formed several reliable composites. Ten questions formed a Change in Personal Identity composite (α = .913)—for example, “DBS fundamentally changes who a person is” and “I would worry that if I went through DBS, I would no longer recognize myself as the same person.” Two of the questions formed a DBS Makes One Less Human composite (α = .857)—namely,
“In a way, DBS makes one less human” and “In a way, DBS makes one more cyborg-like.” Two other questions formed a Comfort with Undergoing DBS composite (α = .887)—for example, “I would feel comfortable undergoing DBS if it was medically recommended.” Finally, two questions formed a Mind Is Brain composite (α = .768)—for example, “The success of DBS provides strong evidence that the mind just is the brain and not some kind of special entity.” We conducted correlational analyses between these four composites and the Dualism subscale of the FWI.

Mecacci and Haselager’s view predicts a negative correlation between scores on the Dualism subscale and the Change in Personal Identity composite, since they claim dualism acts as a protective factor against changes to the “genuine self.” Similarly, they should predict a negative correlation between the Dualism subscale and the DBS Makes One Less Human composite, because they claim dualism allows people “to gain some distance from the unsettling idea of potentially becoming a human–machine hybrid” (34). Lastly, they should predict a positive correlation between Dualism and Comfort with Undergoing DBS composite, because DBS should not be seen as threatening to the dualist for the reasons mentioned already. Since the Mind Is Brain composite is a measure of neurocentric materialism, we would expect the results from this composite to negatively correlate with the Dualism subscale of the FWI.

RESULTS
Dualism strongly negatively correlated with the belief that the mind is brain, r = −.612, p < .001, suggesting that people who believe less strongly in dualism believe more strongly in neurocentric materialism. Contrary to Mecacci and Haselager’s hypothesis, belief in dualism was not correlated with belief in DBS changing personal identity, r = −.034, p = .764. Moreover, belief in dualism positively correlated with the belief that DBS makes one less human, r = .288, p = .009. In other words, the more one believed in dualism, the more one tended to believe that DBS made one less human. Additionally, belief in dualism was negatively correlated with feeling comfortable undergoing DBS, r = −.270, p = .014. The Mind Is Brain composite—our proxy measure of neurocentric materialism—positively correlated with feeling comfortable with undergoing DBS, r = .315, p = .004. In other words, dualists tended to be less comfortable with the prospect of undergoing DBS, while neurocentric materialists tended to be more comfortable.

DISCUSSION
This set of results taken together poses a challenge to Mecacci and Haselager’s hypothesis, and we believe provides initial evidence in favor of the opposing view. That is, our data support the view that dualists are more likely to believe that people have special essences that interact with and can be interfered with via the brain, and because of this, dualists, not materialists, find DBS more threatening.

Even if we are right, this isn’t to say that Mecacci and Haselager were not on the right track. One of their hypotheses was that the “frequently reported maladaptations might be partially caused by a conceptual shift away from dualism and toward a ‘neurocentric’ materialism, promoted by the scientific explanation [by medical experts]” (abstract). Of course, the reasoning behind this “shift hypothesis” (as we might call it) is their claim that dualism acts as a protective factor, and that the shift away from dualism erodes that protection.1

While our data challenge their reasoning behind the shift hypothesis, another version of the shift hypothesis may still explain some of the psychosocial maladaptations associated with DBS. A belief in special essences, in a soul, is a belief deeply held by many (Bering 2006), and DBS may challenge this deeply held belief. The challenging of a deeply held belief can be unsettling and can lead to psychosocial maladaptations. Under this view, and contra Mecacci and Haselager, it is not the content of the belief that matters (e.g., dualism vs. neurocentric materialism), but rather it is the fact that a deeply held belief is being challenged in a way that leads to inconsistencies and conflict within the individual. The challenging of deeply held beliefs can lead to dissonance, psychological discomfort, and, in some cases, anxiety, hostility, and depression (Russell and Jones 1980). The more deeply held the belief, the more likely it is that negative attitudes will develop toward the self (Elliot and Devine 1994), leading to more acute psychosocial maladaptations.

If this “dissonance hypothesis” is correct, it also undercuts the intended appeal of Mecacci and Haselager’s preferred conceptual framework: embodied embedded cognition. As they point out, prominent versions of the embodied approach are not dualist. They are instead materialist, although not braincentric, since they emphasize physical entities beyond the brain, such as the body and its interaction with the environment. Thus, even embodied embedded cognition could yield maladaptations, as it likewise conflicts with the intuitive dualism that apparently is tacitly accepted by most people.

In any event, we join Mecacci and Haselager’s call for more empirical work on this important topic. We believe their hypothesis that dualism acts as a protective factor, along with other competing hypothesis including our suggested “dissonance hypothesis,” is deserving of further empirical attention. Such empirical studies not only may tell us more about maladaptive psychosocial responses to DBS, but also may have the power to tell us much more

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1. It’s not clear to us whether Mecacci and Haselager saw their “shift hypothesis” as a separate hypothesis from the “dualism as protective” hypothesis. However, by separating these two claims, Mecacci and Haselager may be able to salvage an important aspect of their view, even if dualism doesn’t act as a protective factor.
about the mind more generally (e.g., the effect of certain mind–body frameworks on identity and well-being).

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REFERENCES


Shifting One’s Worldview to Neurocentrism May Be Troubling, But the Evidence That This Is the Cause of Maladaptation in DBS Patients Is Lacking

Adrian C. Byram, University of British Columbia
Peter B. Reiner, University of British Columbia

Mecacci and Haselager (2014) raise the spectre of DBS causing maladaptation as a result of the conceptual shift from a dualist to a neurocentric worldview. While we agree that being confronted by a neurocentric perspective can indeed be troubling for many, we offer two lines of reasoning that suggest such concerns are misplaced in the case of DBS.

The first assertion is based upon the lived experience of a patient with a chronic neurological disease. If one considers an individual faced with, for example, chronic Parkinson’s disease (PD; the most common reason for DBS), the patient likely will have had years of experience with the symptoms of the disease that include not only motor dysfunction but also neuropsychiatric deficits as well. The changes that the disease brings on will have been attributed to changes in brain function, and the realization that such changes alter key features of cognitive function are likely to be neuroessentializing in and of themselves. If the patient (and families) are neurocentric naïfs, it is not unreasonable to expect that their worldview will at least be shifted toward soft neuroessentialism; if they are already soft neuroessentialists, they may even move toward hard neuroessentialism (Reiner 2011). Thus, it is not unreasonable to expect that by the time they are confronted with the prospect of DBS, they will already be in a position that is at least somewhat accepting of a neurocentric worldview.

Having said that, it is germane to note that the effect of DBS is immediate: The moment the stimulator is turned on, behavior changes. In such a scenario, people may very well perceive that they are no longer the person they were only moments ago. Such a sudden change may be