Articles

Deep Brain Stimulation, Continuity over Time, and the True Self

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Abstract: One of the topics that often comes up in ethical discussions of deep brain stimulation (DBS) is the question of what impact DBS has, or might have, on the patient's self. This is often understood as a question of whether DBS poses a threat to personal identity, which is typically understood as having to do with psychological and/or narrative continuity over time. In this article, we argue that the discussion of whether DBS is a threat to continuity over time is too narrow. There are other questions concerning DBS and the self that are overlooked in discussions exclusively focusing on psychological and/or narrative continuity. For example, it is also important to investigate whether DBS might sometimes have a positive (e.g., a rehabilitating) effect on the patient's self. To widen the discussion of DBS, so as to make it encompass a broader range of considerations that bear on DBS's impact on the self, we identify six features of the commonly used concept of a person's "true self." We apply these six features to the relation between DBS and the self. And we end with a brief discussion of the role DBS might play in treating otherwise treatment-refractory anorexia nervosa. This further highlights the importance of discussing both continuity over time and the notion of the true self.

Keywords: deep brain stimulation (DBS); personal identity; self; anorexia nervosa

Deep brain stimulation (DBS) is a technology that uses surgically implanted electrodes to directly stimulate targeted brain areas. Because this targeted stimulation can modulate certain functions and behaviors, DBS has been used as a treatment for several medical conditions, including Parkinson's disease. However, the very idea of "merging" with a piece of medical technology in this way, and in effect getting an on/off switch between different modes of functioning, raises the question of what impact DBS might have on the self. Indeed, when interviewed about their experiences with DBS, patients and their families have voiced thoughts and concerns about changes in the patient's self. Some of them talk of the change as positive—for instance, as "a second birth"—and some as negative—for example, "I no longer feel like myself."[1]

There is a small but growing interdisciplinary literature that discusses how best to conceptualize and evaluate DBS's potential impact on the self. A dominant trend in this literature thus far has been to focus on the possibility that DBS poses a threat to the patient's continuity over time, whether by threatening the patient's numerical identity or his or her narrative identity.[2] More recently, two papers by Felicitas Kraemer and Hannah Maslen et al. have noted that there is value in considering the effects that DBS may have not just on identity but also on patient authenticity: that is, whether the patient lives in accordance with his or her "true self." They point out that DBS may threaten one without threatening the other.[3]

In this article, we show why consideration of the effects of DBS on the true self is crucial by identifying six important features of the concept of the true self: (1) the concept permeates human thinking and so will affect how stakeholders interpret the results of DBS; (2) the true self is a synchronic notion that permits us

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to describe effects of DBS on the self that the diachronic concept of personal identity does not; (3) the extent to which the true self is expressed can be a matter of degree; (4) the degree to which persons feel their true self is expressed can be influenced by their modes of functioning, which can be affected by DBS; (5) in some cases, radical transformation can make the true self more fully expressed; and (6) which features are considered characteristic of a person's true self depends, in an important sense, on which features he or she values.

These points lead to two main conclusions about the role of the true self in discussions about DBS: (1) despite its potential for radical transformation, DBS may help to restore or make more manifest the patient's true self, and (2) it will be hard to discuss the self—particularly in concrete cases—without bringing values and value judgments to bear on how we interpret our own and other people's selves.

After first approaching our subject in general terms, we close by demonstrating the importance of considering the effects on the true self in the case of DBS as a possible form of treatment for anorexia nervosa.

Living with DBS: A Few Case Reports

To begin with a few more remarks about DBS and the effects it can have on patients and their lives, it is important to point out that DBS is unusual in part because it is reversible, adjustable, and frequently has unanticipated effects on modes of functioning—including motivation—other than those being targeted. The DBS device can be turned on and off (and sometimes goes off because the batteries run out). The amplitude of the current can also be adjusted, which means that it is possible to compare the situation with the stimulation on and off.

Ideally, the following should happen when the device is on: (1) the targeted symptoms are controlled or alleviated, and (2) the patient is otherwise functioning in a mostly "normal" way, in accordance with his or her overall character, and to the satisfaction of the patient and the patient's family. Sometimes, however, the second condition is not completely fulfilled; this is not always experienced as negative.

The following are two cases, one in which the nontarget effects are slightly unusual but seemingly experienced as positive, the other in which the nontarget effects are experienced as negative.

Mr. B., a Dutch patient, had an unexpected reaction on the initiation of his otherwise successful DBS treatment for obsessive-compulsive disorder (OCD).[4] He abruptly became a music lover, with a very specific point of interest. One day, with the DBS device on, Mr. B. heard Johnny Cash on the radio and immediately developed a strong urge to listen to Johnny Cash—particularly to songs from later in his career, when his voice was fuller and more rugged. Mr. B. bought all of Johnny Cash's CDs and DVDs and associated specific songs with every occasion and every mood. Mr. B. reported that when listening to Johnny Cash he had a new sense of self-confidence and felt as if he were the hero of a film. When the DBS device was turned off, however, Mr. B's interest in Johnny Cash diminished, along with his newfound confidence.

In a different case, a male patient's severe motor impairments were successfully treated with DBS—but a strong nontarget effect also occurred. While on DBS, he became manic to the point that the patient and his healthcare providers faced a

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stark choice: either to (1) stop the DBS treatment, leaving the patient's motor impairment so severe that he required constant care, or (2) continue the DBS treatment, relieving motor impairments but resulting in mental impairment to a degree that would require psychiatric institutionalization. While in a competent state (with the DBS device off), with an understanding of the psychological consequences, the patient opted for the latter. The medical team assented. The patient's psychological condition did result in his institutionalization, but he avoided motor impairment.[5]

Two other kinds of nontarget effects, both having to do with motivation, are also worth mentioning in the present context:

1) *Motivation zapping*: In some patients, DBS is successful in alleviating motor impairment but leaves the patient with a sense of aimlessness or meaninglessness. Or it can leave the patient without the desire to carry out plans he or she had had for when the DBS treatment alleviated his or her impairments. One patient, a company director, had looked forward to going back to work pre-DBS, but, posttreatment, when he was capable of returning to work, he found he no longer wanted to.[6]
2) *Impulsivity triggering*: In other patients, DBS triggers impulsivity, sometimes to the detriment of the patient's relationships. One spouse complained that while influenced by DBS, her husband would have bizarre ideas like wanting to drive across the border without passports.[7] Another spouse complained that her husband suddenly "wanted to live like a young man"; she wanted him to go back to being calm as he was before.[8] One female patient "lost all social inhibitions, was in love with two neurologists, and tried to kiss and embrace people."[9]

Whether satisfied or dissatisfied, patients and their families frequently describe the effects of DBS in a way that suggests it has had a profound impact on the self of the patients. Mr. B. called himself "Mr. B. II" while the DBS was turned on. He acted in a way that suggested to his medical team that he felt like a "new and improved version of himself."[10] Some patients similarly speak of a "second birth" while undergoing DBS treatment. In contrast, some patients say things like, "I no longer feel like myself." Some have a negatively altered body image: "I feel like a robot," or "I feel like an electronic doll."[11] There are also cases in which the patient feels as if the change that has occurred is not of great significance, but the family sees things differently and believes there has been a considerable change in the patient's self. The daughter of a Parkinson's disease (PD) patient said of her father, who had become more impulsive, that "it's as if he's someone else entirely . . . he's there, and he's our dad, but not like we've always known him." Her father did not feel he was a different person: "Nope . . . but I do feel a little more energetic these days."[12]

It is easy to be struck by a sense that the DBS treatment has had a profound impact on the self of these patients. However, there are several ways to conceptualize the self, and, with few exceptions, the literature on the effects of DBS on the self has focused primarily on whether DBS threatens patient continuity over time. What has been missing is a discussion of the notion of a person's true self. We now examine the contrast between these two concepts of the self and their implications with regard to DBS.

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Continuity over Time: Numerical and Narrative Identity

The question that tends to be asked most frequently in the literature is the following: Does DBS pose a threat to personal identity over time?[13] Personal identity is usually understood in terms of numerical identity and/or narrative identity.[14] The former is strict identity over time: being the same person as somebody in the past. The latter has to do with whether a person's actions, thoughts, desires, and other features are compatible with the narrative or story that the person has established over the course of his or her life.[15]

With respect to DBS, the following question arises about numerical identity: Are there circumstances in which DBS causes such a radical change in the patient that it seems that one person has been replaced by another? Two responses in the literature to this question are the following: (1) Numerical identity is broken off if DBS causes severe psychological discontinuity, and (2) numerical identity is broken off if DBS radically alters the "core attitudes" of the patient.[16] In the case of narrative identity, the following question is posed: Does DBS bring about a radical disruption of the patient's "narrative flow"? Two responses from the literature here are the following: (1) Narrative identity is disrupted if the patient cannot recognize the sources of her actions and desires as coming from her self-narrative, and (2) narrative identity is disrupted if the patient becomes unable to help to continually create the self-narrative of which she is the author.[17]

We agree that it is important to ask these questions when assessing the possible effects of DBS on the self. But these should not be the only questions that are asked about DBS and the self. Here are three reasons why.

First, framing the discussion in terms of whether DBS is a threat to personal identity suggests that DBS is either detrimental or neutral. This ignores the important possibility that DBS might, in some cases, benefit or reveal the self, perhaps by helping to allay psychological problems.[18] Characterizing the self solely in terms of personal identity does not permit us to consider this possibility.

Second, by framing the discussion in terms of these diachronic questions about identity over time, we overlook the synchronic question of whether DBS has an important impact on the self here and now, independently of how the person relates to herself in the past. DBS can be switched on and off—does one setting make the patient better able to be herself? This can, but need not necessarily, be answered with reference to the patient's past. For example, if a patient has experienced severe OCD over a long period of time, it might be more in keeping with her past narrative if she were to continue having obsessions and compulsions. However, one might think instead that her real self would better served if she could rid herself of that dominant narrative.

Third, by framing the discussion in terms of whether DBS is a threat to personal identity over time, we make it unnecessarily difficult for DBS to have any effects on the self worth discussing. That is, the changes the patient experiences must be fairly extreme in order for DBS to be a threat to personal identity in the numerical and narrative senses. But there are surely less extreme cases in which it seems important to ask what impact DBS has on the agent's self.[19]

For these reasons, we think that the discussion about DBS and the self needs to be widened, so as to better reflect the variety of different concerns that can arise with regard to DBS's impact on the self. To this end, we now consider the notion of the true self and ask what implications it has regarding DBS's effects on patients.

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The True Self: Deeper and Shallower Aspects of the Self

First, it is a common theme in literature, philosophy, and popular culture that there is such a thing as a person's true self (or "authentic self")—that not all of one's characteristics are part of this true self, and that there may even be characteristics that are part of one's true self that have never been manifested. With this theme comes the idea that we can be more or less able to be, know, and realize our true self. Folk wisdom admonishes the insecure to "just be yourself." In Shakespeare's *Hamlet*, Polonius muses, "To thine own self be true."[20] The temple of Apollo bears an inscription of the Delphic oracle's maxim "know thyself." The existentialist philosopher Søren Kierkegaard wrote, "To will to be that self that one truly is, is indeed the opposite of despair."[21] And in a recent feature on the *Huffington Post*, an online news website, the reader learns about "7 ways mindfulness can unlock your authentic self."[22] Recent research also reports that the idea of a true self has an impact on various areas of human psychology, such as judgments about meaningfulness, about the lives of others, and about actions and well-being.[23] This idea of a true or authentic self has a long history of permeating people's thinking, and it continues to do so.

Second, this is a synchronic notion: we can ask, for example, whether our true self is currently shining through, or whether it is somehow being suppressed or repressed. This can, but does not necessarily, involve continuity over time. When the feature in the *Huffington Post* argues that there are seven ways in which mindfulness could help us to unlock our true self, it in effect suggests that mindfulness would help to bring about a discontinuity in the patterns of a person's conduct, and that doing so is necessary in order for the true self to be "unlocked."

Third, whether an individual is able to fully be his or her true self seems to be a matter of degree, rather than an on/off matter. This partly has to do with the idea that there are deeper and shallower aspects of the self: the more we are able to express, through our way of being and acting, the deeper aspects of our selves, the more are we tapping into our true self. The aspects that are closest to a person's true self are sometimes referred to as the person's "core" or "essence." Empirical research reveals that people tend to spontaneously distinguish between what is expressive of someone's core and what is expressive of more superficial aspects of the person's self.[24]

Fourth, as this suggests, our physical state and the way we act (our overall state of functioning) can influence the degree to which our true self is manifest. Consider the case of transgender people who undergo gender-reassignment surgery. Caitlyn Jenner, for example, formerly named Bruce Jenner, is an Olympian athlete who won the gold medal for the men's decathlon in the 1976 summer Olympics in Montreal. In 2015, Jenner underwent gender-reassignment surgery and took the name Caitlyn. In a television interview with Ellen DeGeneres, Jenner commented that "there's nothing better than to be able to wake up in the morning and be your authentic self."[25] DeGeneres responded that "people can relate to that," and the audience clapped. This suggests that whether people feel that their authentic or true self is fully realized may depend on whether they are in a certain physical state. This takes us to our next point.

Fifth, radical transformations—including surgical interventions—can, from some people's perspective, help to bring about a state in which one is better able to realize one's authentic self. This is also illustrated by the Caitlyn Jenner example.

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For Jenner and others like her, being able to be one's true self can require a substantial physical transformation—in this case, a surgical intervention. Although undergoing surgery to better realize their true selves is not something most people wish to do, many people can understand that some people might feel a need to do so, as Ellen DeGeneres noted in her interview with Jenner. Returning also to the example of mindfulness meditation, many people seem to think that meditating can transform their thinking or usual patterns in a way that enables them to better be their true selves. Again, the idea here seems to be that a transformation can sometimes help to realize one's true self.

Sixth—and a final crucial point—there is evidence that our judgments about which aspects of a person represent the deeper aspects of herself (viz., her true self) are typically preceded, and deeply influenced, by underlying values and value judgments. Specifically, some researchers have argued that judgments about which features are most representative of a person's self are influenced by value judgments about which aspects of a person best exemplify what is good or choice-worthy.[26] George Newman et al., for instance, describe a number of interesting studies in which people's intuitions about the true selves of others appear to be driven by their own value judgments regarding what is good and proper.[27] This research suggests that such true self judgments involve what might be called a "presumption towards the good": most people harbor a deep-seated intuition that, beneath the surface, human beings have something within them that draws them toward the good, like sunflowers turn toward the sun, and people will tend to judge that it is a person's good qualities that characterize that person's true self.

In addition to being part of ordinary people's thinking, this intuition about the true self also comes through in both philosophy and literature. The illustrious Enlightenment philosopher Immanuel Kant, for example, thought that the only thing good without qualification was "the good will." Commenting on "the moral law," Kant wrote that it "is valid for us because it springs out of the will as intelligence, i.e. from our authentic self."[28] Kant thought that the intellect and the will were the highest human characteristics and, as a result, was inclined to identify the authentic self with these attributes. In contrast, the hedonistic French author Andre Gide valued sensuality more than intellect. In Gide's 1901 novel *The Immoralist*, the main character is portrayed as finding his real self when he throws off intellectual reflection and moral judgments and instead indulges his sexual desires and sensual appetites. These two examples from the history of philosophy and literature illustrate the pattern observed in Newman and his colleagues' recent studies of ordinary people's thinking: people's judgments about which aspects of a person constitute his or her true self typically conform closely to their evaluative judgments about what aspects constitute their best, or most important, parts.[29] In other words, it appears that people's intuitions and judgments about the true self are not independent of their underlying systems of value; rather, people's intuitions about the true self seem to be aspects of, or situated within, their value systems.

In summary, the notion of the true self (1) seems to permeate much of human thinking; (2) is a synchronic notion that does not necessarily refer to continuity over time; (3) is a matter of degree, whereby some of a person's features are closer to his or her core than others; (4) allows for a person's overall functioning to be more or less expressive of his or her true self; (5) might only be brought out through

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a radical transformation; and (6) is a concept that is typically incorporated or embedded into larger networks of values and value judgments.

DBS and the True Self

We believe that the discussion outlined previously implies the following conclusions about DBS and the self: First, given that the idea of a deep or true self permeates much of our thinking, our judgments and sentiments about DBS and the self are bound to be deeply influenced by this underlying concept of a true self. It might be possible to wholly abstract away from the idea of the true self when we think about DBS from a purely scientific point of view, but then we will abstract away from a notion that seems to be at the heart of our ordinary ways of understanding ourselves and others. Given that this notion has such a strong hold on people's ordinary ways of understanding and interpreting the world, it seems better to allow the notion of the true self to be an explicit part of the discourse on DBS's impact on the self.

Second, it can be asked whether DBS helps to bring out our true self, or whether it instead brings forth less deep and more superficial aspects of our self. This need not necessarily refer back to continuity over time or the narratives that patients create for themselves (though it is certainly possible that it might do so).

Third, the effects of DBS on the self need not be an all-or-nothing matter but, instead, can be a matter of degree. This is a contrast with how some philosophers treat the issue of personal identity over time. They say that either you are the same person, or you're not.[30] Whether DBS, in contrast, helps to bring out or rehabilitate somebody's true self does not seem to be an all-or-nothing matter in the same way. It might help to bring out some of the aspects of the patient that are thought to be at his or her core, while also amplifying other aspects that are thought to be among his or her more superficial aspects.

Fourth, the person's physical and mental states, the way he or she behaves and functions while experiencing DBS (and also while off DBS), may be more or less expressive of his or her true self. A PD patient, having regained greater control over his movements, may experience his true self as being more fully manifest. Similarly, an OCD patient may experience her true self as more fully apparent when she has greater control over her obsessions and compulsions.

Fifth, the fact that a person may undergo a radical transformation following the insertion of electrodes into her brain does not itself prejudge the issue of whether or not the patient's true self is able to blossom. It could be that undergoing this radical transformation makes a patient better able to manifest his or her true self. That is to say, while being stimulated with DBS, the patient may be more his or her true self than when in the more "natural" state in which the DBS device is turned off.

Sixth, any judgment about the effects of DBS is bound to be deeply influenced by the values and norms accepted by the person making the judgment. For example, if someone disvalues impulsivity, she is more likely to view an impulsive patient as being less his true self than would someone else who values impulsivity. In contrast, if we see spontaneity as a characteristic to be welcomed, we could be inclined to think that greater authenticity might be achieved as a result of DBS if it has the side effect of making the patient more prone to act on his or her impulses.[31]

In other words, any discussion of whether the patient's true self is more evident in the presence or absence of DBS is hard to conduct in a value-neutral way.

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It is hard to have such a discussion outside of a broader discussion about what is important more generally in life. To help further illustrate this last point and the point that DBS has the potential to increase the degree to which one's true self is manifest, we turn now to a short discussion of DBS as a possible treatment for anorexia nervosa, a subject that is under investigation.

Deep Brain Stimulation and Anorexia Nervosa

Initial trials with DBS are currently being conducted for treatment-refractory anorexia nervosa.[32] Anorexia nervosa (AN) is a type of affliction in which the issue of value disagreements affecting perceptions about the true self tends to pose a significant difficulty for treatment decisions; it is also a condition in which DBS could potentially restore or increase the manifestation of the patient's true self.

Some AN patients express values that clash starkly with what the public tends to regard as being within the range of values about which sensible people can reasonably disagree. Some of these patients also closely associate such values with their own identity.[33] The following is a striking excerpt from an interview conducted with a patient by a team of psychiatrists led by Jacinta Tan:

> *Interviewer*: If your anorexia nervosa magically disappeared, what would be different from right now?
> *Participant*: Everything. My personality would be different.
> *Interviewer*: Really!
> *Participant*: It's been, I know it's been such a big part of me, and—I don't think you can ever get rid of it, or the feelings, you always have a bit—in you [. . .]
> *Interviewer*: Let's say you've got to this point, and someone said they could wave a magic wand and there wouldn't be anorexia any more.
> *Participant*: I couldn't.
> *Interviewer*: You couldn't.
> *Participant*: It's just part of me now.
> *Interviewer*: Right. So it feels like you'd be losing part of you.
> *Participant*: Because it was my identity.[34]

In a later paper, Tan and colleagues propose that this type of thinking is based in the value systems adopted by some patients with AN. As Tan summarizes them, these values include

> the paramount importance of being thin even to the extent of preferring to risk death rather than put on weight; a positive value to damaging oneself through starvation as a sign of achievement; a value in being different from other people through extreme thinness; and a sense that the anorexia nervosa is part of one's identity such that a cure would be tantamount to becoming another person.[35]

Tan and her team of psychiatrists suggest that such values are candidates to be seen as "pathological," that is, directly caused by the disease. As such, these are not, they suggest, the "authentic values" of the patients. If a patient's refusal to undergo a treatment is due to pathological values, and if such a refusal would

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result in significant risk of harm, the authors propose that it may be legitimate to override the patient's decision. They argue that a patient with pathological values is not fully competent.[36]

Let us now focus on a hypothetical patient with treatment-refractory anorexia and imagine that DBS is proposed as a potential form of treatment. Suppose that this treatment would not only help to cure the patient but also help her to change the sorts of values underlying her problem. If we apply the previously described reasoning of Tan and colleagues to this case, DBS treatment could potentially here be viewed as a way of making manifest the patient's authentic values and true self. The DBS treatment could be described as displacing the pathological values that the patient sees as integral to her identity when she is still afflicted with AN—that is, it could be described in that way if we follow the logic inherent in Tan's definition of pathological values.

Philosophers Hannah Maslen et al. also consider what we should say about this sort of case.[37] In their view, too, DBS could bring about or threaten authenticity. But they are especially concerned with the question of how to determine which features of a patient are authentic in cases in which the patient's values, preferences, and beliefs are highly variable. Maslen and her coauthors highlight the fact, reported by Tony Hope et al., that the mind-set of patients with AN is often unstable and that there is a "shifting between 'mindsets'."[38] In one frame of mind, the patient has "a set of beliefs, goals, and affective states that she sees as directing her to eat more and gain weight. In the other mindset, the patient panics and feels she is not able to put on weight. In this mindset, she may not even be sure that to be healthy she needs to gain weight."[39] Furthermore, Maslen worries that if the patient consents to DBS, then he or she might manifest a third mind-set: namely, the one he or she has while being stimulated with the DBS. Maslen comments that the possibility of adding yet another mind-set that competes with the other two "renders determination of which preference to respect even more difficult" than it might already be.[40]

To resolve the question of which patient preferences should be respected, Tan and her team could appeal here to their distinction between "pathological values" and "authentic values" to argue that the mind-set produced while under the influence of a successful DBS intervention is authentic. That is, they could argue that an AN patient's mind-set is only authentic if it favors continuing DBS or some other form of treatment. Maslen, however, rejects this approach and argues that we should avoid "the automatic prioritization of preferences under treatment." She argues that "physicians should not make the substantive claim that only a patient's desire to continue treatment is authentic."[41] Instead, Maslen suggests that it is better to take a "diachronic approach": physicians should identify those patient values and preferences that remain stable "over time" and over DBS activation.[42] One way we might interpret this diachronic approach is to say that these stable values and preferences are authentic; another possibility is that the values and preferences that the patient stably *experiences as authentic over time* are authentic.

There is still a question, though, about what should be done when patients lack such stable values and preferences or lack a stable experience of authenticity about their values or preferences over time and over DBS activation. After all, Hope and colleagues report that AN patients tend to sometimes vacillate between different mind-sets. In such cases, we need some criteria for determining which mind-set is

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most expressive of the patient's true self and authentic values. Given the sixth point made above—viz., that perceptions of which features are part of a person's true self are influenced by the values of the perceiver—an appeal to values to resolve this problem may be unavoidable. Furthermore, the values that serve as reference points may have to come from a source other than the patient. The reason for this is precisely that if the patient's values and mind-set are unstable in the way described by Hope, then the patient's experience of the authenticity of a given mind-set at one time will not reliably guide him or her to decisions that result in the experience of that same mind-set, or any other mind-sets, as being authentic at other times.

One option here is to follow Tan and colleagues and say that in cases in which the patient has conflicting, shifting mind-sets, and there are no stable values or preferences that could help resolve the question of which mind-set is more representative of the patient's true self, we must rely on the values implicit in our classification of some conditions as pathological and conclude that the mind-set produced by the pathology is less authentic. Not being able to rely on the values of the patient, given his or her instability, we may instead need to take as our reference points widely endorsed values that are viewed as sensible or legitimate even by those who do not hold them: the commonly recognized range of what are regarded as values about which there can be reasonable discussions and disagreements. If the values the patient has in one mind-set fall squarely outside of this range, whereas the values the patient has in a different mind-set fall inside of this range, then this might be taken to give us reason to suppose that the latter values are more expressive of the person's true self than are the former. On this value-based approach, in a case in which the patient exhibits conflicting, shifting mind-sets, we would have reason to think that DBS treatment might help the patient to remain in the mind-set that fits better with her authentic self *if* two conditions are fulfilled: First, this is a sensible-seeming mind-set that the patient at some point held, or toward which she had an inclination, when not under the influence of DBS. And second, the values the patient exhibits when in the *other* mind-set very clearly fall outside of what is otherwise regarded as the range of values about which there can be reasonable discussion and disagreement.[43]

Concluding Remarks

We do not take our remarks about DBS and AN to settle the issue of how to think about the patient's true self if the patient's values (at least in certain mind-sets) are such that they can potentially be interpreted as pathological. Most certainly, more discussion is needed. But we think that these brief reflections on DBS as a possible treatment for AN help support our overall thesis: that in ethical reflections on DBS's potential impact on the self, it is not sufficient to solely and exclusively focus on continuity over time. A discussion of the true self should also be included. As we have sought to illustrate previously, this is an idea that has deep roots within human psychology. Furthermore, it has a number of important features that the notion of continuity over time lacks. Specifically, it permits us to recognize potential consequences of DBS for the self that a consideration of continuity over time alone cannot help us to fully capture and articulate. Thus, when conducting ethical reflections on DBS's impact on the patient and the patient's self, the notion of the true self should not be ignored.[44]

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Notes

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13. E.g., see note 2, Baylis 2013.
14. See note 2.
15. A further way to think of this distinction between numerical identity and narrative identity is to view it as a distinction between the minimal conditions for continuity over time (i.e., numerical identity) to more extensive and qualitative conditions for personal identity over time (i.e., narrative identity).
16. See note 2, Klaming, Haselager 2013; note 2, Witt et al. 2013.
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18. Cf. Levy N. Enhancing authenticity. *Journal of Applied Philosophy* 2011;28(3):308–18.
19. Cf. Gilbert F. The burden of normality: From "chronically ill" to "symptom free." New ethical challenges for deep brain stimulation postoperative treatment. *Journal of Medical Ethics* 2012;38(7):408–12.
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30. Cf. Parfit D. *Reasons and Persons*. Oxford: Clarendon; 1984.
31. Felicitas Kraemer's discussion of DBS and authenticity helps to bring this out (see note 3, Kraemer 2013). She criticizes Agid et al. (see note 6, Agid et al. 2006) for labeling the issues they discuss as "social maladaptions," and the basis for this criticism appears to be that this choice of words conjures up a negative association, whereas there might not be anything bad (as Kraemer sees things) about becoming more impulsive.
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34. See note 33, Tan et al. 2003. at 539
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42. See note 37, Maslen et al. 2015, at 228.
43. We are assuming here that we should mainly consider cases in which there is at least one mind-set in which the patient him- or herself thinks in terms of values that incline him or her to want to consent to the DBS. We are not discussing the possible case in which the patient is so set on the values associated with AN that there is no mind-set in which the patient is inclined to agree that he or she needs healthcare.
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