

Neuro-Prosthetics, the Extended Mind, and Respect for Persons with Disability

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1 Introduction

In discussions of performance enhancement, as in applied ethics generally, it is tempting to think that we can answer the hard ethical questions by discovering boundary lines that lie in the subject matter itself. The hope, here, is that we could settle an array of thorny issues if only we could identify the fault-lines between, for example, therapy and enhancement, or between pharmacological identity-management and the restoration of the authentic self. And within the wider public debate, there are loud voices declaring that the boundary-lines are actually so obvious that only self-interested lawyers and out-of-touch intellectuals could miss them. Consider, for example, the following quote:

Some people want to engineer their babies. They hope to buy them an edge in the lottery of life, to fix them up with special genes for extra intelligence or height or skin color or sexual orientation. How is this different from giving your kid piano lessons and extra tutoring, some of them ask? It's very much like the difference between cutting out junk food and injecting yourself with steroids. There is a line – and the vast majority of us can see it
(Shanks 2005).

Especially in the face of such pronouncements, one of the most important contributions that philosophers can make is in guarding against precisely this tendency to think that the answers lie in *discovering* these boundary-lines in the phenomena themselves. My aim here is to make such a contribution to the debate over neuro-enhancement. My goal, then, is to question the pat answers.

In particular, I will be arguing that, in discussions about the ethical status of neuro-prostheses, there are deep conceptual and ethical problems with the implicit reliance on what I call the “Invasiveness Criterion”, that is, the idea that what makes some neuro-prosthetic technologies problematic is that they violate a boundary between what is inside the person and what is outside. This underwrites, I believe, a widespread and influential intuition that we ought to be vigilant with regard to enhancement technologies that penetrate the body. Indeed, I believe that this focus on the inner-outer boundary helps explain much of the deep-seated suspicion regarding

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enhancement technology that involves genes and drugs, a suspicion that is reflected in the typically negative talk of “dope” and “pill-popping” or of “genetic *manipulation*”. After all, since pharmaceuticals and gene therapies work only by being taken up within our bodily organs, they always involve a breach of the boundary of the body. There is, I think, a link in the minds of many between suspect forms of enhancement and the idea that the person is being invaded by something alien. But it becomes unclear to what extent the problem lies with the invasiveness or something else.

This is part of why I find it so fruitful to look at the case of neuro-prosthetic devices, which include now-familiar technology (such as cochlear implants) as well as more experimental or even still-hypothetical technology (such as brain-machine interfaces). For they can be integrated into the body to varying degrees, which makes it easier to analyze the role played by metaphysical assumptions, especially the idea that crossing the boundary of the skin represents something that is intrinsically problematic. Indeed, the prosthetic devices that seem to generate the least amount of moral unease seem to be precisely those – like artificial limbs, wheelchairs, and hearing aids – that seem to work more from the outside, as detachable supports or as tools. Perhaps this is because employing devices to do what we couldn’t otherwise do is an essential part of the human condition. We are, after all, the “tool-using animals.” But here again, the distinction between a “tool” and a prosthesis that is implanted into the body is more apparent than real. Or so I shall be arguing.

I begin by describing two largely hypothetical cases of neuro-prostheses used for non-therapeutic enhancement, one involving enhanced control of the hearing experience and the other, improved face recognition. These are, I believe, typical of the sort of cases – brain-machine interfaces – that tend to raise serious ethical concerns. My aim is to analyze the assumptions underlying this reaction. After setting aside important pragmatic concerns (about health risks, lack of informed consent, or social inequality of access and benefits) and then rejecting criticisms based on the “unnaturalness” of neuro-prostheses, I focus on two criteria that might be used to criticize neuro-prosthetic implants: the “Invasiveness Criterion” already mentioned, and the “Combined Criterion”, which adds the idea that it is *non-therapeutic* invasions that are intrinsically problematic. Using variations on the two core cases, I argue that we ought to reject both criteria, on conceptual grounds (Sections 5 and 8) as well as ethical grounds (Sections 6 and 9). This suggests that we should look elsewhere for grounds on which to object to these neuro-enhancements, and in Section 10 I discuss several principles that may be informing objections to them, several of which are worth taking seriously. However, I refrain from either taking a position on which neuro-enhancements are acceptable or on which principles ought to guide us in making such assessments. My focus is rather on criticizing the widespread though tacit assumption that the problematic character of some cases can be read off the nature of prosthetic devices themselves, and particularly on whether they are implanted in the body.

2 Two Cases of Neuro-prostheses

In this Section I describe two cases of neuro-enhancement by means of a device. I will refer to such devices as “neuro-prostheses” to distinguish them from improvements in performance that are achieved genetically, pharmacologically, or developmentally (e.g., through training). But I shall be using the term “neuro-prosthesis” in a rather broad manner. I will not be restricting it to medical or other therapeutic purposes, nor will I be restricting it to cases in which a device replaces a specific body part that has been lost or damaged. This last point is particularly important. I am assuming that neuro-prostheses are intended to enable persons with regard to certain capabilities or forms of human functioning, and that these functions can be realized in different ways. In this sense, a blind person’s cane is a neuro-prosthesis: it contributes to restoring a lost capacity for spatial orientation. Neuro-prostheses thus come in a wide variety of forms.

The case of Anna. Consider first the case of Anna, a lover of classical music and professional recording engineer. She has devoted her life to ensuring that music recordings capture the balanced sound of symphony orchestras in an optimal fashion. Doing this requires discerning an extremely complex acoustical array: she must determine how the sound is to be mixed, so as to capture the optimal balance of frequencies. Anna has extensive training in this, along with a certain degree of natural talent. But she is only human, and there are subtleties in the orchestra’s sound that can only be picked up by a computer-assisted array of microphones. This suggests a possible (but fictitious) adaptation of existing hearing aid technology that would involve replacing her cochlea with much more sensitive artificial follicles and then hardwiring that to her ventral cochlear nucleus. In the scenario envisioned in this thought experiment, the practical upshot is that after several years of training, she is able to make much finer discriminations of pitch, and this enables her to produce the higher-quality recordings that she has always been striving for but could not produce.¹

The case of Peter. In a related case, imagine someone who is tired of bumping into people he’s met before and not being able to remember their names, or even be sure whether he’s met them before. He has a special face-recognition system installed that works as follows.² A tiny camera in his eyeglasses sends images wirelessly to a small computer in his pocket, which uses fast, flexible software to recognize faces out of a database of acquaintances and generate an audio signal of the name that is then channeled directly to the brain via an interface with the auditory system, such that after several months of training up the system, he no longer even notices the difference between cases in which he is prompted for the name of someone he meets and cases in which he recalls the name without assistance. The vocalized names merge into the constant flow of perceptual input and cognitive processing that comprises human subjective experience. He can also effortlessly indicate to the computer that a face not in the system needs to be recorded for later updating. He now feels very much at ease at class reunions and conferences, situations that used to frustrate him enormously.

3 Objections Based on Pragmatic Concerns or Unnaturalness

What ought we to think of these neuro-enhancing brain-machine interfaces? The face recognition technology in particular might actually be so appealing that many would not seriously object, but that would be disingenuous for many, since it is in fact precisely the sort of brain-machine interface that otherwise generates almost visceral opposition. We are talking, after all, about holes being drilled into people's skulls to feed wires in. My target, in any case, is the view that neuro-prostheses of this sort are at least *troubling*.

In what follows, I shall be setting aside some of the potentially very significant pragmatic grounds for objecting to such devices. Clearly, for example, neuro-prosthetic implants raise concerns about health risks, increased vulnerability to abuse, or unfair advantage in competitive contexts. In addition, as in the case of cosmetic surgery, people may often not really be clear on the benefits and risks. These are important and relevant concerns. But my focus in the present context is with the question of whether there is a distinct line of reasoning that can be traced to the nature of the technology and its impact on the human, especially in terms of the violation of the boundary of the skin. All I assume is that many would still be opposed to this sort of neuro-enhancement even without these pragmatic worries.

Before turning to my main diagnosis, I need to comment briefly on one approach that I shall be setting aside, namely the approach based on the "violation of the natural", which is often linked to feelings of revulsion and abhorrence. On this view, which has been gaining quite a bit of attention from ethicists recently,³ our feelings of revulsion serve as a last-ditch indication that something gone wrong, a violation of basic categories. As Leon Kass puts this, for example, in "The Wisdom of Repugnance", "In this age in which everything is held to be permissible so long as it is freely done, repugnance may be the only voice left that speaks up to defend the central core of our humanity" (Kass 1997: 20). Along these lines, one might object to the cases of Anna and Peter as repugnant. There may well be cases (necrophilia, perhaps) for which the only compelling grounds for rejecting it are that it generates a widely shared and deeply felt revulsion. But there are also plenty of reasons to be concerned about this line of argument, the most obvious being that people's "yuck"-responses over the centuries have all too often turned out to be morally problematic prejudices, such as reactions to interracial marriage.

For my purposes, however, there is a deeper problem with the whole idea that neuro-prostheses might be criticized as violations of nature. This is because the very idea that prostheses are unnatural relies some problematic assumptions about how the human body is implicated in the actions of agents. This is not simply the first-year philosophy student's objection that nothing is either normal or natural. The point is that we need to be cautious about making normative claims on the basis of the purported naturalness of how particular aspects of human agency can be embodied or instantiated. For, in cases where we are talking about some essential feature of human agency that we want to protect or encourage, what we are really talking about is not how many fingers one has or the precise mechanism by which one's serotonin levels are maintained but rather that one is able to shape the environment or that

one's sensitivity to changes in circumstances is reflected in changes in emotion or mood. One reason for taking this broadly functionalist approach stems from a commitment to a conception of the human that is not prejudiced against persons with disabilities – those with fewer fingers, for example. The burden of proof ought to lie with those who would argue that what ought to matter, for a normative conception of human agency, is not functions and capabilities but rather their instantiation. But the other reason is that most features of the mind show evidence of “multiple realizability”, such that there are different mechanisms by which they can be realized.⁴ Thus, for example, we might see the capacity for shared attention as a key feature of the broader intersubjectivity distinctive of persons, but that does not mean that the mechanisms that instantiate that capacity have to be of a certain type.⁵ Given this multiple realizability, it cannot be assumed that the ontology of the nervous system will draw the lines between *the* “natural” way of instantiating a capability and abnormal ways of doing so. In any such case, we face a choice between doing the normative line-drawing in terms of capability or physical realization, and given the risk of exclusionary bias associated with the latter, it seems good policy – both as a matter of metaphysics and ethics – to favor a characterization in terms of capability rather than in terms of a particular instantiation of that capability.

4 Boundary Violations

In the next five sections, I take up the idea that the wrongness of cases such as that of Anna and Peter lies, at least to a significant extent, in the fact that the physical integrity of the person is being violated. In addition to the remarks I've made so far, in specifying the scope of my argument, I should emphasize that the issue I'm focusing on is a matter of distortion that is traceable to the device as it is implanted within the body of the person. Thus, it is crucial that we distinguish criticisms of the enhancement of the capacity from the way in which it is achieved. As I said at the outset, this is one of the advantages of focusing on neuro-prostheses: because some neuro-prosthetic technology can function from outside the body, we can separate the permissibility of its enhancing effects from the permissibility of putting it inside the body. Put this way, the cases I'm interested in are those in which the neuro-prostheses are generally considered to be unproblematic in a handheld form, but not once implanted into the body. And the position I wish to challenge is the common view that, whereas implants raise serious concerns, one is at liberty to employ all the latest wireless technologies and other gadgets to improve my performance (as long as the technology is not dangerous to me or others, and we are not talking about a context of circumscribed competition where it would be against the spirit of the game to gain this advantage).

I believe that to the extent to which the remaining line of critique is actually distinctively about the invasiveness of the brain-machine interface, it is indefensible. And that it only appears compelling on the basis of other issues that are not necessarily linked to the fact that the device penetrates the barrier of the skin and

skull. There are two main objections to make to the supposition underlying this critique, that is, the supposition that the skin-and-skull barrier is a relevant ethical watershed: it involves bad metaphysics, and it has unacceptable ethical implications, particularly with regard to the standing of persons with disabilities.

5 Conceptual Difficulties with the “Invasiveness Criterion”: Bad Metaphysics

The difficulties with the Invasiveness Criterion start with the very notion that we can make a sharp distinction between what is “inside” or “outside” the person. Ordinarily, of course, we think of the skin as the relevant boundary between where I end and the rest of the world begins. But it turns out that there are good reasons to question the idea that my *person*, as something not to be transgressed or violated, coincides with my *body*. Some parts of my body, for example, may be of no concern to me. The tips of my fingernails that I am about to clip off, for example, are not essential to my person. Conversely – and most important for my purpose – there are aspects of who I am and what I can do that extend beyond the boundary of my skin.

This last point has been developed in a particularly compelling manner – and with special relevance for *neuro*-prostheses – in so-called “extended mind” approaches within the philosophy of mind.⁶ On this view, the limits of what counts as an agent’s “own cognitive system” can plausibly be thought of as a fluid and thus as determined not by any ontology of the human organism but rather by the social practices in which the agent participates. In light of this, it is hard to see why we should think that the boundaries of the human agent coincide with the physical boundary of an organism’s skin and skull, especially given what I said earlier about multiple realizability, namely, that it cannot be assumed that the ontology of the nervous system will draw the lines between *the* “natural” way of instantiating a capability and abnormal ways of doing so.

To see the force of the “extended mind” perspective, consider a few examples that are more mundane than the cases of Peter and Anna. Take, first, the paradigm case of the extension of agency, that of a blind person’s cane. What the reports from expert cane-users indicate is that the cane is not simply a tool employed by the hand, but it comes to be experienced as itself part of one integrated sensory organ. They don’t feel the vibration of the cane and infer that there is an object in the way; they feel the object through the cane as much as they feel it through their arm (Merleau-Ponty 1962: 143).

Now consider a case of cognition, that of long division. If someone asks me what 2384 divided by 127 is, I realize immediately that I can’t do it “in my head”. I either reach for a calculator, or I grab pencil and paper. But as I work the arithmetic out on paper, what are we to say about *where* the cognitive system is located – within my brain, or also partly in what I am doing with the paper and pencil? Since I cannot do the arithmetic without the paper and pencil (or calculator), it seems clear that they are essential parts of whatever system it is that is doing the long division.

This point can be extended further, as David Chalmers and Andy Clark have done with their fictional example of “Otto”:

Otto suffers from Alzheimer’s disease, and like many Alzheimer’s patients, he relies on information in the environment to help structure his life. In particular, Otto carries a notebook around with him everywhere he goes. When he learns new information, he writes it down in his notebook. When he needs some old information, he looks it up. For Otto, his notebook plays the role usually played by a biological memory

(Clark and Chalmers 1998).

For Otto, in other words, his notebook is as much a part of his person as the deteriorated neurons inside his skull. Indeed, tearing sheets out of his notebook may be a greater assault on his cognitive system than removing some of his brain tissue. Of course, as Clark and Chalmers are aware, there are significant differences between how one “consults one’s memory”, depending on whether one looks a notebook or *just remembers* – differences in portability, speed, and so on. But these differences do not map neatly onto the differences between “extended” cognitive systems and those inside the boundary of skin and skull. Sometimes it’s quicker or more reliable to glance at my notebook than to rely on what’s in my skull. What we need to realize is that it is these features of the cognitive system and not the boundary of the skin and skull per se that should be seen as the basis for the distinctions we might want to make. I’m not denying that we may want to make distinctions here, on the basis of our social practices and the value-commitments embodied in them. I am only denying that the question of what distinctions we ought to make is answered by given features of the skin-skull boundary.

Consider now three variations on the case of Anna: BMI-Anna (as described previously, with the brain-machine interface); PDA-Anna (using a handheld personal digital assistant); and DNA-Anna (whose performance stems from genetically rooted talent, not assistive devices). Consistent with the methodology I have adopted, what we need to ask is, What ethical differences between the three remain once one takes away differences in how they function. Assume that they perform indistinguishably well across the entire spectrum of relevant tasks, that they all pass a sort of “Turing test” relative to each other for this capacity:⁷ if observers were to judge only on the basis of performance, not knowing which performance was caused by which version of Anna, there would be no way to tell the difference between them. Of course, if it is impossible for BMI-Anna to ever be as good as DNA-Anna, or if it is impossible for PDA-Anna ever to perform as well as BMI-Anna, then the embodiment will have ethically relevant implications. But then we don’t have a case where the embodiment *itself* is what makes the difference, and that is what we are concerned with.

One might object that performance is not all that matters; that a sense of ownership is crucial, or a sense that the relevant actions flow from me as a person. But here the parallel point holds. In the absence of any principled grounds for thinking it impossible for it to seem as natural to do something by means of a tool than not, we can contemplate the ethical status of neuro-prostheses in which Anna’s tool or implant is experienced transparently, in the same way that for some blind persons, it is the tip of their cane and not the tip of their fingers where their organ for touch ends.

The point for our purposes is that once we have the cases in which there are no differences in performance or experiential transparency between BMI-Anna, PDA-Anna, and DNA-Anna, then it is unclear what non-question-begging argument there could be for saying how BMI-Anna's implant is "inside" her person in a way that PDA-Anna's handheld device is not. But then, once it becomes clear that the distinction between inside and outside the body does not coincide with the distinction between inside and outside the person, it becomes unclear why the boundary of the skin should be seen as so ethically significant. And it becomes evident that the Invasiveness Criterion trades on some conceptual confusions. For it's not clear how the inside–outside distinction can even be formulated in a way that matters.

6 An Ethical Difficulty with the “Invasiveness Criterion”

In addition to these conceptual and metaphysical difficulties with the Invasiveness Criterion, there is an ethical concern worth mentioning. There are several ways in which to think about the idea that, as a matter of principle, we ought to view with suspicion any assistive devices that penetrate the skin or that involve an interface with the nervous system. One might base these reservations on the idea that, empirically, there are greater risks associated with such devices or the procedures associated with them. Thus, as in cases of genetically modified foods, one might think that a “precautionary principle” is appropriate, such that we should be cautious about introducing technology whose impact is not yet understood. The increased difficulty of reversing the implantation of devices – especially those, like cochlear implants, require a great deal of training – might be thought to strengthen these concerns.

But there is a concern here about the way in which these arguments work. To begin with, they appear to depend on the idea that we need non-rational taboos to protect us from ourselves. Otherwise it is hard to see why the invasiveness itself ought to be the relevant principle rather than various well-founded principles regarding the risks, irreversibility, etc. that may or may not be empirically linked with invasive devices. This implicit suggestion that we need to short-circuit people's decision-making in this way is problematically paternalistic. Moreover, the difficulty with taboos is the way in which they take on a justificatory life of their own. People start worrying about whether or not a device is invasive rather than whether it is effective, safe, and so on. And this can lead to a situation in which people are encouraged to focus on aspects that may not be important. Just as there are serious risks to mental and physical health resulting from widespread tendencies to demonize “popping” pills or visiting a “shrink”, there is a risk that subtle (and not-so-subtle) taboos about neuro-prostheses may cloud people's thinking about what is really good for them. As with considerations regarding cosmetic surgery, we would be well advised to avoid ethical decision-making that trades on the same emotional reactions as freak shows. Enlightenment is called for.

7 Medical Therapy vs Non-Medical Enhancement: The “Combined Criterion”

In arguing against the idea that invasiveness alone should serve as a moral criterion, I have not mentioned one quite natural form that this objection can take, namely, that such invasive neuro-prostheses certainly ought to be permitted in the case of disease and disability, but not otherwise. Think of a case in which Anna is deaf and elects to get a cochlear implant. Or imagine that Peter’s face-recognition prosthesis serves to relieve his prosopagnosia, a rare but severely debilitating condition in which persons can perceive and recognize details of their environment but cannot recognize the faces of even their closest friends and family.⁸ If Peter’s brain-machine interface is very effective at providing him with a subjectively transparent and objectively accurate means of recognizing faces via the audio clues channeled into his brain in association with computer analyzed video images, then it’s hard to see why the penetration of the skill ought to matter.

This line of thinking suggests that what may have been missing in the discussion thus far is the distinction between forms of invasive neuro-prostheses that serve a medical purpose and those that are merely for cosmetic or non-therapeutic purposes. Perhaps, in other words, what makes certain neuro-prosthetic devices worrisome is that they are both non-therapeutic and invasive. Call this the “Combined Criterion.”

Of course, if my arguments in the preceding sections are correct, the whole notion of invasiveness ought not to be treated as marking a genuine ethical boundary, and if that is true, it won’t help to combine it with another consideration. But the argument against it is strengthened by showing that it is problematic even when qualified in a plausible manner. And however much the enhancement/therapy distinction may be in dispute, there is no denying the intuitive relevance of those invasions of the body that occur in a medical context and those that don’t. Consider surgery. What renders it permissible for a surgeon to cut me open (or even to perform “minimally invasive” laparoscopic surgery) is not simply that I gave her permission. The permissibility lies in the whole package of therapeutic aims, practices of training, professional responsibilities, etc. Without this larger meaning-complex – and especially without the purpose of healing me – cutting me open is morally suspect, even if I consent. The claim I wish to consider is that a similar sort of argument can be made for the case of neuro-prostheses: that their invasiveness creates a presumption against them, except when they are part of a reasonable medical treatment program.

As with the Invasiveness Objection, there are both conceptual and ethical grounds for questioning the Combined Criterion. Conceptually, there are, of course, well-known difficulties with the therapy/enhancement distinction, and I review them quickly in the next section. But there are also serious ethical difficulties that I take up in Section 9 regarding not only the restriction of treatment option but also the implicitly denigrating effects of viewing neuro-prostheses as a necessary evil.

8 Conceptual Difficulties with the “Combined Criterion”: Therapy and Enhancement

In the recent debates over “enhancement”, the emerging consensus seems to be that the prospects for identifying a principled difference between enhancement and therapy are dim,⁹ and that the really decisive considerations actually lie elsewhere, in the purposes of medicine,¹⁰ the fair distribution of public health resources,¹¹ or the vision of human beings as part of a wondrous creation that calls for gratitude and appreciation.¹² Even there, however, problems remain, particularly regarding the prospect of distinguishing those cases in which what the performance-enhancing treatment addresses is a disability or not. For we are all disabled in the sense that there are things that we cannot do but that we could do with some assistance. Thus, the relevant question must be reformulated as having to do with the level of functioning to which we believe all persons have a claim-right. But that is a question that can only be formulated on the basis of the contextual specifics of what treatments are available, what resources are available, and how various treatments will enable various forms of functioning. This is a matter of determining which capacities are to be viewed as especially important and which deserve a lower priority. But these issues are not going to be answered by finding bright lines in the treatments themselves or in the forms of disability themselves. In short, these are important questions, but it is a confusion to think that they can be answered in a conceptual distinction between “treatment” and “enhancement”.

9 Ethical Difficulties with the “Combined Criterion”: Disrespect for the Differently (En)Able

But suppose that there were some general way of saying which particular methods of treatment are permissible only as treatment and not as enhancement. I believe that *ethical* difficulties would remain, having to do with the respect that is owed to persons with disabilities who use prostheses. In a nutshell, the concern is that the Combined Criterion builds on and reinforces a tendency to view various forms of prosthetic devices as intrinsically disturbing, an attitude that is at odds with the respect and recognition legitimated claimed those who are, as I shall say, “differently (en)abled”.

There are at least two ways in which this particular disrespect for persons with disability occurs. First, it is important that discussions of assistive technology appreciate the fact that many people who use prosthetic devices to restore lost function often do not view these devices as a misfortune, but rather as opening up new opportunities or at least as an equally valuable way of instantiating the function. This is true, for example, of some people and their (motorized) wheelchairs.¹³ This revaluation of enabling tools is part of a larger effort within the disabilities movement to de-stigmatize prostheses. But insofar as the Combined Criterion is designed to provide a way of saying how a neuro-prosthesis that is intrinsically monstrous might nonetheless be permitted because it is part of therapy, it leaves intact the purported

monstrosity of the device itself. This is the logic of a “necessary evil”: it remains an evil. After all, according to the Combined Criterion, we are talking about something that would be an abomination in a non-disabled person. But to those differently (en)abled persons who view their prostheses as part of who they are, a failure to leave open the space to stake a claim to that de-stigmatized cyborg identity involves a lack of respect.

Second, the Combined Criterion has the clear implication that a person’s prosthesis is “not really part of her”. Respect for persons is not to be confused with respect for their bodies; rather the target of the respect is the full person, however that site of concerned agency is physically realized. Again, I am not saying that all users of prostheses do or ought to identify with their prostheses. Rather, this is a point about the metaphysics of the addressee of respect for persons. It needs to be at least an open possibility that in some cases, this is most appropriately understood as including various assistive devices. This is a rather straightforward implication of something that I take to be uncontroversial: that what we respect are not bodies but persons.

There are two further unwelcome ethical implications of the Combined Criterion for persons with disabilities that I wish to mention briefly. The first becomes a problem if one formulates the anti-enhancement principle in such a way that prostheses are *impermissible* in cases in which the level of functioning is raised above normal levels. This would make it obligatory to avoid prostheses that boost individuals’ performance beyond normal levels, as if there were an obligation to make sure that a hearing device didn’t allow someone to be able to hear better. It would be perverse to require that the person would have to choose the prosthesis that was not as effective.

Finally, one further problem of moral perception is that, since the Combined Criterion entails the invasiveness criterion, it still relies on the logic of abomination discussed earlier. And it is simply implausible to suggest that the fact that the prosthesis serves a therapeutic purpose will be sufficient to disengage the disgust-reaction, since the gut reactions to the breaching of the skin boundary are hardly going to be fine-tuned enough to track distinctions between therapeutic and non-therapeutic uses of the same technology. If, by hypothesis, an aversion to invasions of the body is supposed to be part of the deep grammar of our ethical responses, say, upon seeing a computer cable going into someone’s skull, it is unclear why we should think that that feeling would evaporate once we see that the person is a quadriplegic. And this is all the more complicated in the case of *cognitive* deficits, which are typically much less visible.

10 Conclusion: Post-metaphysical Concerns with Neuro-prostheses

Where does this leave us with the issue of how to evaluate various neuro-prostheses ethically? As I said at the beginning of Section 5, my focus here has been on the notion that there is something intrinsically problematic about implanting neuro-prostheses that would be unproblematic if they were outside the body. My argument

has been that this boundary of the skin is a misleading distraction. But I still want to hold open the possibility for arguing on other grounds that there are grave concerns regarding the use of neuro-prostheses. Indeed, part of my motivation in developing this argument is to open up room for a discussion of enhancements that is free from these distracting metaphysics. And before concluding, I would simply like to illustrate this point by sketching two potential concerns that could be raised about some neuro-prostheses – whether they are inside the body or are “mere tools” – and that are distinct from more familiar concerns regarding the safety of devices, the quality of the consent given for incorporation of such technologies, the social effects of differential access, and the character of individuals’ motives for using them. The first has to do with issues of the notion of first-personal authority, and the second has to do with interpersonal practices.

As I mentioned earlier, one concern that people have about neuro-prostheses is that they will cut the agent off from her actions, in the sense that the machinery involved diminishes an experience’s immediacy, transparency, or naturalness. I suggested that there was no reason, in principle, why neuro-prostheses would have to interfere with the experience. And in the relatively familiar cases of tool use – getting used to bifocals or a new computer keyboard – it is relatively clear what the variation in immediacy or transparency involves. After a while, you just don’t notice any more. But there is also the particularly complex type of immediacy or transparency associated with the first-personal authority of avowals, in which the immediacy of the expressive act is of a piece with the authority of what one is saying. Richard Moran has recently made this point in discussing the case of someone who accepts the truth of her psychotherapist’s assertion that she feels betrayed by her family, but although she can report this fact about herself (as a third-person observation), she cannot avow it (as a first-person report on a more-or-less immediate sense she has of her emotional state) (Moran 2001: Section 3.3). In this sense, she can speak authoritatively *about herself* but not *for herself*.

In terms of *this* form of transparency, we can ask whether there might be a form of self-dissociation associated with avowal that might result from the kind of indirectness seemingly involved in, say, Peter’s face-recognition implant. For even if we can imagine that Peter no longer notices that the information is prompted aurally, it is hard to shake the idea that he is just hearing voices rather than really recognizing people and recalling their names. Of course, as I have already said in discussing the “unnaturalness” objection, there are problems with the quick assumption that relying on prosthetic devices necessarily involves something “outside” the agent. There are plenty of cases in which people use various devices but experience it to be fully integrated into their thinking, acting, and feeling. And perhaps it is, in principle, just as possible to say, “My left wheel is really bothering me today” as it is to say, “My knee is really bothering me”. And yet there does seem to be a real worry here, about having an alienated relationship with one’s self.

Typically, these questions about dissociation are asked with regard to the effects of neuro-pharmacological interventions on authenticity.¹⁴ And more work needs to be done to work out how this discussion could be applied to the case of devices. But in the space available to me here, I would like to suggest that there are important

concerns about dissociation that can best be formulated in terms of a loss of self-trust. In extreme cases, individuals who have been victims of rape or torture or other forms of profound physical abuse lose the ability to take their own desires and feelings seriously as authoritative. This self-dissociation can be profoundly damaging to human agency.¹⁵ And it might be the case that in some cases a cognitive prosthesis like Peter's could disrupt the relationship of avowal in a way that would have similar results. Just as victims of trauma lose the ability to avow their desires, someone who relied extensively on a cognitive prosthesis – to provide an alternative means of accessing memories or an alternative source of awareness of deficit – might no longer be in a position to avow certain feelings, desires, and beliefs – that is, to assert them with the kind of automatic first-person authority with which we ordinarily report our states of mind.

There are complex issues here, which I am really only broaching here. Ultimately, the question to be asked in individual cases is whether people with neuro-prostheses are able to integrate them in such a way that that can be part of the system responsible for one's avowals. The central point I have been making in this paper is that whichever of these concerns turn out to be relevant, they will apply equally to prostheses inside the body and to tools outside the body.

Finally, I would like to mention a further class of considerations that might be raised, having to do with the ways in which neuro-enhancements may disrupt presuppositions of important social practices. If we expect people to be able to remember the faces of loved ones better than those of casual acquaintances, then various assistive devices might disrupt the social meaning of recognizing someone. Imagine Peter telling you that he recognized you only because he was prompted by his implant. It's not just that you'd be less impressed with his uncannily good memory; rather, you might well feel hurt or slighted, not to mention deceived. He might seem not to be as close a friend as you thought, despite his insisting that it makes no difference. His "recognition" of you just seems less personal. After all, he never forgets *anyone's* name.

Appreciating the force of this concern – and properly placing it – requires recognizing both the contingency of social practices and the potential for real loss regarding experiences that are available only within that practice. The first point is straightforward: social practices change, including practices involving cognitive tools. Fifteen years ago, if someone had asked me for my wife's office phone number and I didn't know it "by heart", it would certainly have been viewed a puzzling, or even a cause for concern – either about my absent-mindedness or about my marriage. Now, however, few of my colleagues (and *none* of my students!) would find it odd in the least if I had to look at my cell phone to say what the number was. Perhaps something like that could happen with the social meaning that is currently attached to recalling people's names. And it might entail a major improvement in the lives of people with memory impairments.¹⁶

But there is another side to this phenomenon. For it might be that there is a complex and deeply significant package of emotional responses, rewarding experiences, social meanings, and so on that are bound up with the social practices that are held together by the expectation that one remember one's friends and loved ones'

names – such that it might be crucial to retain the practice, in order to retain the constellation of meaningful experiences that it makes possible.¹⁷ There are difficult questions here, having to do with the primacy of current practices as providing continuity of social meaning, or rather a primacy of individual experiences within the practices, as motors of change.¹⁸ But again, my central point is that these questions ought to be asked across the board with regard to assistive devices (whether implanted or not) and even more broadly, to other forms of enhancement, including education.

These are only a few of the concerns that can be raised about neuro-prosthetic devices. Much more work needs to be done to analyze them, with appropriate attention not only to the principles involved, but also to the concrete details of their specific technologies, their social context, and the widely varying ways in which they are used. These are big issues. Here, I have been primarily concerned with a rather modest point, although it is often overlooked. My point is not that the dangers associated with elective, implanted neuro-prostheses are exaggerated, but rather that the debate needs to be carried out in terms of features of neuro-enhancements that are also found in other assistive technologies, especially those outside the body. Only by running the debate in that way can we avoid the dual dangers of demonizing legitimate interests in enablement and trivializing the potential dangers of many enhancement technologies by saying they are “merely tools”. We need to be even-handed. And a simplistic metaphysics of “inside vs outside” or “therapy vs enhancement” just gets in the way of thinking clearly about what the real concerns are regarding the neuro-enhancement technologies that will play an ever more powerful role in our lives.¹⁹

Notes

¹ I’m leaving aside here the questions of whether the subjective qualitative “feel” of the sound would be different for her. For a discussion of this issue of “qualia,” see especially David Lewis’s functionalist reply to Frank Jackson’s “knowledge argument” in Lewis 1983: 130–132.

² After developing this thought experiment, I discovered that Bradley Rhodes (1997) describes a similar “remembrance agent” and that it is also discussed by Andy Clark (2003: Ch. 2).

³ Renick 1998; Stout 1983; Kass 1997. Stout and Renick both draw on Mary Douglas’s notion of the “liminal”; see Douglas 1966.

⁴ The *locus classicus* for this pivotal argument against mind-brain identity theories is Putnam 1975.

⁵ It might be that only certain mechanisms are able to realize various capabilities, but that is an empirical question.

⁶ Central texts here are Clark and Chalmers 1998 and Clark 2003. Although it is beyond the scope of this paper to take up the debate over the extended mind, it is not uncontroversial.

⁷ See Alan Turing (1950: 433–460). Turing proposed a way of operationalizing intelligence, not by specifying necessary and sufficient conditions for intelligence, but by focusing on whether in double-blind tests an entity behaves in a way that is indistinguishable (in terms of intelligence) from an intelligent human. My suggestion is that this point could be generalized to other cases of “capacity-equivalence”.

⁸ For a particularly interesting discussion of prosopagnosia, see Duchaine et al. 2003.

⁹ See especially the now-classic texts by Parens (1998) and Juengst (1998). See also the essays in Schöne-Seifert et al. (forthcoming).

¹⁰ For an excellent discussion of these issues, see Talbot forthcoming.

- ¹¹ On issues of distributive justice, see the contributions by Reinhard Merkel and by Achim Stephan and Saskia Nagel to Schöne-Seifert et al. (forthcoming); see also parallel discussions in Buchanan et al. 2000.
- ¹² As discussed by Erik Parens 2005.
- ¹³ I am grateful to Tom Shakespeare for a discussion of related issues; see also Shakespeare and Watson 2002.
- ¹⁴ Kramer 1993; Elliot 2003; DeGrazia 2005: esp. Ch. 5 (“Enhancement Technologies and Self-Creation”) and Schmidt-Felzmann forthcoming.
- ¹⁵ For further discussion and references, see Anderson and Honneth 2005.
- ¹⁶ And, of course, there is also the possibility of intentionally controlling the information in Peter’s neuro-prosthesis, so as to make the information about loved ones more quickly or fully available.
- ¹⁷ This idea is a central theme in the work of Charles Taylor. See especially Taylor 1989.
- ¹⁸ Indeed, I think that this dynamic provides a way of articulating Erik Parens’s distinction between an ethic of “gratitude” or appreciation and one of “creativity” (Parens 2005).
- ¹⁹ In preparing and revising this paper, I have benefited from suggestions and criticisms of audiences in St. Louis, Nijmegen, Delmenhorst, Utrecht, and Doorn, and from an anonymous reviewer for this publication.

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