



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

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

23 I begin by describing two largely hypothetical cases of neuroprostheses used  
24 for non-therapeutic enhancement, one involving enhanced control of the hearing  
25 experience and the other, improved face recognition. These are, I believe, typi-  
26 cal of the sort of cases – brain-machine interfaces – that tend to raise serious  
27 ethical concerns. My aim is to analyze the assumptions underlying this reaction.  
28 After setting aside important pragmatic concerns (about health risks, lack of in-  
29 formed consent, or social inequality of access and benefits) and then rejecting crit-  
30 icisms based on the “unnaturalness” of neuroprostheses, I focus on two criteria  
31 that might be used to criticize neuro-prosthetic implants: the “Invasiveness Crite-  
32 rion” already mentioned, and the “Combined Criterion”, which adds the idea that  
33 it is *non-therapeutic* invasions that are intrinsically problematic. Using variations  
34 on the two core cases, I argue that we ought to reject both criteria, on concep-  
35 tual grounds (Sections 5 and 8) as well as ethical grounds (Sections 6 and 9).  
36 This suggests that we should look elsewhere for grounds on which to object to  
37 these neuroenhancements, and in Section 10 I discuss several principles that may  
38 be informing objections to them, several of which are worth taking seriously.  
39 However, I refrain from either taking a position on which neuro-enhancements  
40 are acceptable or on which principles ought to guide us in making such assess-  
41 ments. My focus is rather on criticizing the widespread though tacit assump-  
42 tion that the problematic character of some cases can be read off the nature of  
43 prosthetic devices themselves, and particularly on whether they are implanted in  
44 the body.

## 2 Two Cases of Neuroprostheses

In this Section I describe two cases of neuro-enhancement by means of a device. I will refer to such devices as “neuroprostheses” 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 neuroprostheses 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. Neuroprostheses 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.<sup>1</sup>

*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.<sup>2</sup> 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

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02  
03 What ought we to think of these neuro-enhancing brain-machine interfaces? The  
04 face recognition technology in particular might actually be so appealing that many  
05 would not seriously object, but that would be disingenuous for many, since it is  
06 in fact precisely the sort of brain-machine interface that generates almost visceral  
07 opposition. We are talking, after all, about holes being drilled into people's skulls to  
08 feed wires in. My target, in any case, is the view that neuro-prostheses of this sort  
09 are at least *troubling*.

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

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

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

01 one's sensitivity to changes in circumstances is reflected in changes in emotion or  
02 mood. One reason for taking this broadly functionalist approach stems from a com-  
03 mitment to a conception of the human that is not prejudiced against persons with  
04 disabilities – those with fewer fingers, for example. The burden of proof ought to lie  
05 with those who would argue that what ought to matter, for a normative conception  
06 of human agency, is not functions and capabilities but rather their instantiation. But  
07 the other reason is that most features of the mind show evidence of “multiple real-  
08 izability”, such that there are different mechanisms by which they can be realized.<sup>4</sup>  
09 Thus, for example, we might see the capacity for shared attention as a key feature  
10 of the broader intersubjectivity distinctive of persons, but that does not mean that  
11 the mechanisms that instantiate the capabilities have to be of a certain type.<sup>5</sup> Given  
12 this multiple realizability, it cannot be assumed that the ontology of the nervous  
13 system will draw the lines between *the* “natural” way of instantiating a capability  
14 and abnormal ways of doing so. In any such case, we face a choice between doing  
15 the normative line-drawing in terms of capability or physical realization, and given  
16 the risk of exclusionary bias associated with the latter, it seems good policy – both as  
17 a matter of metaphysics and ethics – to favor a characterization in terms of capability  
18 rather than in terms of a particular instantiation of that capability.  
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#### 21 **4 Boundary Violations**

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

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

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

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## 11 **5 Conceptual Difficulties with the “Invasiveness Criterion”:** 12 **Bad Metaphysics**

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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 *neuroprostheses* – in so-called “extended mind” approaches within the philosophy of mind.<sup>6</sup> 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.

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

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

(Clark and Chalmers 1998).

08  
09 For Otto, in other words, his notebook is as much a part of his person as the deteri-  
10 orated neurons inside his skull. Indeed, tearing sheets out of his notebook may be a  
11 greater assault on his cognitive system than removing some of his brain tissue. Of  
12 course, as Clark and Chalmers are aware, there are significant differences between  
13 how one “consults one’s memory”, depending on whether one looks a notebook or  
14 *just remembers* – differences in portability, speed, and so on. But these differences  
15 do not map neatly onto the differences between “extended” cognitive systems and  
16 those inside the boundary of skin and skull. Sometimes it’s quicker or more reliable  
17 to glance at my notebook than to rely on what’s in my skull. What we need to realize  
18 is that it is these features of the cognitive system and not the boundary of the skin  
19 and skull per se that should be seen as the basis for the distinctions we might want  
20 to make. I’m not denying that we may want to make distinctions here, on the basis  
21 of our social practices and the value-commitments embodied in them. I am only  
22 denying that the question of what distinctions we ought to make is answered by  
23 given features of the skin-skull boundary.

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

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

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

## 14 **6 An Ethical Difficulty with the "Invasiveness Criterion"**

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

28 But there is a concern here about the way in which these arguments work. To be-  
29 gin with, they appear to depend on the idea that we need non-rational taboos to pro-  
30 tect us from ourselves. Otherwise it is hard to see why the invasiveness itself ought  
31 to be the relevant principle rather than various well-founded principles regarding  
32 the risks, irreversibility, etc. that may or may not be empirically linked with invasive  
33 devices. This implicit suggestion that we need to short-circuit people's decision-  
34 making in this way is problematically paternalistic. Moreover, the difficulty with  
35 taboos is the way in which they take on a justificatory life of their own. People start  
36 worrying about whether or not a device is invasive rather than whether it is effective,  
37 safe, and so on. And this can lead to a situation in which people are encouraged to  
38 focus on aspects that may not be important. Just as there are serious risks to mental  
39 and physical health resulting from widespread tendencies to demonize "popping"  
40 pills or visiting a "shrink", there is a risk that subtle (and not-so-subtle) taboos about  
41 neuroprostheses may cloud people's thinking about what is really good for them. As  
42 with considerations regarding cosmetic surgery, we would be well advised to avoid  
43 ethical decision-making that trades on the same emotional reactions as freak shows.  
44 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.<sup>8</sup> 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 neuroprostheses 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 neuroprostheses: 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 neuroprostheses as a necessary evil.

## 01 **8 Conceptual Difficulties with the “Combined Criterion”:** 02 **Therapy and Enhancement**

03  
04 In the recent debates over “enhancement”, the emerging consensus seems to be that  
05 the prospects for identifying a principled difference between enhancement and ther-  
06 apy are dim,<sup>9</sup> and that the really decisive considerations actually lie elsewhere, in  
07 the purposes of medicine,<sup>10</sup> the fair distribution of public health resources,<sup>11</sup> or the  
08 vision of human beings as part of a wondrous creation that calls for gratitude and  
09 appreciation.<sup>12</sup> Even there, however, problems remain, particularly regarding the  
10 prospect of distinguishing those cases in which what the performance-enhancing  
11 treatment addresses is a disability or not. For we are all disabled in the sense that  
12 there are things that we cannot do but that we could do with some assistance. Thus,  
13 the relevant question must be reformulated as having to do with the level of func-  
14 tioning to which we believe all persons have a claim-right. But that is a question that  
15 can only be formulated on the basis of the contextual specifics of what treatments are  
16 available, what resources are available, and how various treatments will enable var-  
17 ious forms of functioning. This is a matter of determining which capacities are to be  
18 viewed as especially important and which deserve a lower priority. But these issues  
19 are not going to be answered by finding bright lines in the treatments themselves or  
20 in the forms of disability themselves. In short, these are important questions, but it  
21 is a confusion to think that they can be answered in a conceptual distinction between  
22 “treatment” and “enhancement”.

## 23 24 25 **9 Ethical Difficulties with the “Combined Criterion”:** 26 **Disrespect for the Differently (En)Able**

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

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

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

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

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

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

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## 40 **10 Conclusion: Post-metaphysical Concerns** 41 **with Neuroprostheses**

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Where does this leave us with the issue of how to evaluate various neuroprostheses 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 neuroprostheses that would be unproblematic if they were outside the body. My argument has

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

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

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

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

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

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

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

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

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

01 names – such that it might be crucial to retain the practice, in order to retain the  
 02 constellation of meaningful experiences that it makes possible.<sup>17</sup> There are difficult  
 03 questions here, having to do with the primacy of current practices as providing con-  
 04 tinuity of social meaning, or rather a primacy of individual experiences within the  
 05 practices, as motors of change.<sup>18</sup> But again, my central point is that these questions  
 06 ought to be asked across the board with regard to assistive devices (whether im-  
 07 planted or not) and even more broadly, to other forms of enhancement, including  
 08 education.

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

## 27 Notes

28  
 29 <sup>1</sup> I’m leaving aside here the questions of whether the subjective qualitative “feel” of the sound would  
 30 be different for her. For a discussion of this issue of “qualia,” see especially David Lewis’s functionalist  
 31 reply to Frank Jackson’s “knowledge argument” in Lewis 1983: 130–132.

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

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

36 <sup>4</sup> The *locus classicus* for this pivotal argument against mind-brain identity theories is Putnam 1975.

37 <sup>5</sup> It might be that only certain mechanisms are able to realize various capabilities, but that is an empirical  
 38 question.

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

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

45 <sup>8</sup> For a particularly interesting discussion of prosopagnosia, see Duchaine et al. 2003.

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

<sup>10</sup> For an excellent discussion of these issues, see Talbot forthcoming.

- 01 <sup>11</sup> On issues of distributive justice, see the contributions by Reinhard Merkel and by Achim Stephan and  
 02 Saskia Nagel to Schöne-Seifert et al. (forthcoming); see also parallel discussions in Buchanan et al. 2000.  
 03 <sup>12</sup> As discussed by Erik Parens 2005.  
 04 <sup>13</sup> I am grateful to Tom Shakespeare for a discussion of related issues; see also Shakespeare and Watson  
 05 2002.  
 06 <sup>14</sup> Kramer 1993; Elliot 2003; DeGrazia 2005: esp. Ch. (“Enhancement Technologies and Self-Creation”)  
 07 and Schmidt-Felzmann forthcoming.  
 08 <sup>15</sup> For further discussion and references, see Anderson and Honneth 2005.  
 09 <sup>16</sup> And, of course, there is also the possibility of intentionally controlling the information in Peter’s  
 10 neuroprosthesis, so as to make the information about loved ones more quickly or fully available.  
 11 <sup>17</sup> This idea is a central theme in the work of Charles Taylor. See especially Taylor 1989.  
 12 <sup>18</sup> Indeed, I think that this dynamic provides a way of articulating Erik Parens’s distinction between an  
 13 ethic of “gratitude” or appreciation and one of “creativity” (Parens 2005).  
 14 <sup>19</sup> In preparing and revising this paper, I have benefited from suggestions and criticisms of audiences  
 15 in St. Louis, Nijmegen, Delmenhorst, Utrecht, and Doorn, and from an anonymous reviewer for this  
 16 publication.

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01 **Chapter 22**

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