

Enhancement Technologies and Human Identity¹

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As the President's Council on Bioethics emphasized in a recent report, rapid growth of biotechnologies creates increasingly many possibilities for enhancing human traits. This article addresses the claim that enhancement via biotechnology is inherently problematic for reasons pertaining to our identity. After clarifying the concept of enhancement, and providing a framework for understanding human identity, I examine the relationship between enhancement and identity. Then I investigate two identity-related challenges to biotechnological enhancements: (1) the charge of inauthenticity and (2) the charge of violating inviolable core characteristics. My thesis is that a lucid, plausible understanding of human identity largely neutralizes these charges, liberating our thinking from some seductive yet unsound objections to enhancement via biotechnology.

Keywords: *authenticity, biotechnology, enhancement, identity, inviolability, President's Council on Bioethics*

I. INTRODUCTION

Human beings have always been interested in self-improvement. We diet, exercise, color our hair, and modify work habits to bring about changes in ourselves that we consider improvements. Technologies have long played a role in self-improvement projects; diet pills, weight machines, and hair dye are hardly new. Somewhat newer are certain biomedical means to perceived self-improvement—or enhancement, as it's often called today. Thus, although cosmetic surgery has been available for decades, the use of Selective

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Serotonin Reuptake Inhibitors (SSRIs) such as Prozac and Paxil by the “worried well” is a recent phenomenon. And genetic enhancement remains a prospect for the future. As the President’s Council on Bioethics emphasized in a recent report (2003), rapid growth of biomedical technologies (“biotechnologies” for short) creates increasingly many possibilities for enhancing human traits—contributing a sense of urgency to attendant ethical issues.

Most of these ethical issues have received considerable attention in the literature. These include concerns about

1. safety;
2. the autonomy of self-regarding decisions to use enhancements;
3. decisions for children;
4. complicity with suspect cultural norms;
5. promoting biopsychiatry’s reductionist agenda;
6. fostering social quietism;
7. self-defeat in widespread use of enhancements;
8. transgressing the bounds of medicine; and
9. distributive justice.²

This article will not address these concerns. Rather, it will take up the claim that enhancement via biotechnology is inherently problematic for reasons pertaining to our identity. After clarifying the concept of enhancement, and providing a framework for understanding human identity, I will examine the relationship between enhancement and identity. Then I will investigate two identity-related challenges to biotechnological enhancements, challenges frequently given voice but rarely examined with analytical care:

1. the charge of inauthenticity and
2. the charge of violating inviolable core characteristics.

My thesis is that a lucid, plausible understanding of human identity largely neutralizes these charges, liberating our thinking from some seductive yet unsound objections to enhancement via biotechnology.

II. THE CONCEPT OF ENHANCEMENT

In keeping with recent usage, let us use the term *enhancement technologies* to refer to certain technologies when they are employed for enhancement purposes. Thus, the same technology—Paxil, for example—will count as an enhancement technology in certain contexts (when used for enhancement purposes), but not in others (when used to treat a psychiatric illness).

In biomedicine, enhancements are commonly understood as “interventions designed to improve human form or functioning beyond what is necessary

to sustain or restore good health” (Juengst, 1998, p. 29). Stated another way, enhancements are interventions to improve human form or function that *do not respond to genuine medical needs*, where the latter are defined

1. in terms of disease, impairment, illness, or the like,
2. as departures from normal (perhaps species-typical) functioning, or
3. by reference to prevailing medical ideology.

This conception identifies enhancements by the goal of improvement in the absence of medical need. But sometimes they are picked out by the nature of their means. Some means of self-improvement, such as vigorous training, are considered natural and virtuous. By contrast, some means are perceived as artificial, as involving corrosive shortcuts, or as distorting medicine, making the self-improvement suspect and classifying it as an enhancement—think of steroid use in sports.

Let us adopt the more common conception, which contrasts enhancements with *treatment* or *therapy*, interventions responding to genuine medical needs.³ Accordingly, the use of exercise, hair dye, surgery, SSRIs, and genetic technologies of the future will qualify as enhancements when the desire for self-improvement, but no medical illness or impairment, motivates these interventions.

Naturally, the concept of enhancement can be illuminated by way of contrast with treatment only if the treatment/enhancement distinction is meaningful. This might be doubted in view of such examples as the following. Children who are very short due to a deficiency in growth hormone are classified as receiving treatment in receiving synthetic growth hormone. Meanwhile, children who have normal levels of growth hormone, but are equally short simply because their parents are short, count as “normal,” so that their receiving synthetic growth hormone counts as enhancement—despite their being equally disadvantaged by their height and standing to gain equally from the drug (White, 1993). Also challenging the treatment/enhancement distinction are certain cases involving “cosmetic psychopharmacology.” In these cases, patients who are described as having no psychiatric illness or impairment seek a psychiatric medication not merely to feel better in wrestling with their psychological issues, but also to change their personalities (Kramer, 1993). One might argue that, since such patients struggle with psychological phenomena that can be ameliorated with medication, it means little to say that they are not ill whereas someone who, say, barely qualifies as having depression or clinical anxiety is ill.

Certainly, the treatment/enhancement distinction will seem arbitrary in a range of cases because our distinction between normal and abnormal health will sometimes seem arbitrary. Nevertheless, the distinction seems compelling and meaningful in most contexts, the gray area between treatment and enhancement notwithstanding. Many scenarios involving muscle-building,

cosmetic surgery, and future use of genetic technologies are paradigm instances of enhancement. Moreover, I am willing to accept the distinction for the sake of argument even if its status is questionable. Opponents of biotechnological enhancements need the distinction in order to name the class of interventions they oppose. Because I favor a cautious liberalism regarding these technologies, I prefer to assume the conceptual field on which the debate over their appropriateness most naturally takes place—and then evaluate enhancements on the basis of their merits and demerits (although the present essay will consider only identity-related objections). Hereafter, therefore, I will assume that “treatment” and “enhancement” are meaningful, contrasting terms.

III. A TWO-PART FRAMEWORK FOR UNDERSTANDING HUMAN IDENTITY

To assess identity-related objections to the use of enhancement technologies, we need to understand the relationship between enhancement and identity. This, in turn, requires sufficient understanding of the two relations. With enhancement clarified, it remains to examine identity.

The philosophical literature on human identity—or *personal* identity, as it's usually called—is enormous and rapidly expanding.⁴ I believe that most of this literature makes two fundamental errors. The first error is the failure to recognize that there are two distinct senses of human identity—which we may call *numerical identity* and *narrative identity*—both of which prove to be important to certain ethical issues.⁵ As we will see, conflating the two can easily confound moral reasoning. The second error is overestimating the strengths of a psychological approach to our numerical identity and underestimating the strengths of a biological approach. I defend these claims at length elsewhere (DeGrazia, 2005, chaps. 2 and 3). For present purposes, it will be enough to clarify the numerical identity/narrative identity distinction and the basic claims of the competing psychological and biological approaches. (Although I defend the biological approach, the arguments of this paper do not depend on its correctness.)

The analytic tradition in philosophy has focused on numerical identity. This is the relationship an entity has to itself over time in being one and the same entity. An account of numerical identity provides criteria for something of a particular kind to continue to exist through change. Thus, a flower may grow, change color, and wilt before going out of existence. A car may deteriorate and undergo the replacement of certain parts while remaining one and the same car. Similarly, a human person undergoes enormous changes over the years, yet a single individual may reflect on all of these changes as having occurred *to him or her*.

So what are the persistence conditions of a human person? Which changes are so substantial (Aristotelean pun intended) that they entail our death or ceasing to be? Theories of what analytic philosophers have called personal identity attempt to answer these questions. (I prefer to speak of *our* identity or *human* identity, because *personal* identity half-suggests either

1. that we are *essentially* persons and cannot exist at any time without being persons at that time (a highly debatable claim assuming personhood is understood, à la Locke, in terms of psychological capacities), or
2. that we seek criteria for our numerical identity *only so long as we are persons* (whereas we seek criteria for our numerical identity, period.)

According to the psychological approach, our numerical identity consists (at least partly) in some sort of psychological continuity. In most psychological theories (e.g., Locke, 1694/1975; Perry, 1972; Parfit, 1984), the relevant type of continuity is a continuity of experiential contents, or the maintaining of psychological connections, over time. Examples of such psychological connections are having an experience and later remembering it, forming an intention and later acting on it, and the persistence of certain beliefs, desires, and character traits. In some psychological theories (e.g., Unger, 1990; Baker, 2000; McMahan, 2002), by contrast, the relevant type of continuity is the continuation of one or more basic psychological capacities, which may remain despite loss of memories and other experiential contents. Examples include a basic capacity for reasoning or, even more minimally, the capacity for conscious experience; either capacity could survive complete amnesia. On any psychological theory, permanent loss of the capacity for consciousness—and, therefore, of any specific types of mental states or psychological connections—entails the end of our existence. The psychological approach to our identity, representing a wide variety of more specific theories, has enjoyed majority support among philosophers in recent decades.

A major alternative, the biological approach, holds that our continuing existence over time requires no psychological continuity; rather, we continue to exist so long as we remain (biologically) alive (see, e.g., Olson, 1997). According to this view, we came into existence early in gestation, whenever a human organism of our kind emerged. (While some assume that this must be at conception, I argue [2005, chap. 7] that we come into being when we are uniquely individuated—that is, when spontaneous twinning has become impossible and embryonic cells have become functionally differentiated and work as an integrated unit.) Thus, we existed as presentient fetuses and we can continue to exist in a permanent coma or a permanent vegetative state. Although few of us would value the prospect of existing without any psychological capacities, the biological approach cautions us not to confuse the issue of what is valuable in our existence with the metaphysical issue of

our numerical identity. According to this approach, the most plausible conception of our essence views us not as essentially *persons* (in a Lockean psychological sense) or *minds* (beings with the capacity for consciousness)—as suggested by psychological theories—but as essentially *human animals or organisms*.

The debate between the psychological and biological approaches concerns our numerical identity. Most people, most of the time, do not think much about numerical identity. People think more often about their *narrative* identity. This involves an individual's self-conception: her most central values, implicit autobiography, and identifications with particular people, activities, and roles. This is the sense of identity at issue when someone has an identity crisis (Schechtman, 1996). When a confused adolescent, or an adult experiencing a mid-life crisis, asks, "Who am I?" she is typically not suffering from amnesia. Instead, she is trying to get her bearings about what's most important to her, how she "defines" herself, and what self-image can guide her satisfyingly through major life decisions. Narrative identity straightforwardly involves psychology. Thus, a proponent of the biological approach to our numerical identity can grant that the psychological approach nicely captures much of what's involved in *narrative* identity, because psychological connections over time are essential to developing, maintaining, and refining a sense of oneself as the protagonist of one's life-story.⁶

In view of these competing accounts of numerical identity, which has been distinguished from narrative identity, one might wonder whether this distinction collapses for proponents of the psychological approach. After all, on this approach, psychology is crucial to both senses of identity. Nevertheless, the issues are distinct regardless of one's view of numerical identity, because different questions are at stake. The issue of numerical identity concerns criteria that determine whether a being at one time and a being at another time are, despite change, one and the same being. The issue of narrative identity asks what is most central and salient in a given person's self-conception. These are different questions, one metaphysical or conceptual, the other value-laden and *inherently* psychological. Unless we remain mindful of the numerical identity/narrative identity distinction, our reasoning about human identity can quickly become mired in conceptual confusion—as occurs fairly often in moral discussions of enhancement technologies.

IV. THE RELATIONSHIP OF ENHANCEMENT PROJECTS TO IDENTITY

Enhancement projects appear to be connected with human identity—with who someone is, or, relatedly, who she wants to become. Carl Elliott even suggests that the most interesting feature of enhancement technologies is

their connection with central aspects of a person's identity (2003, p. 26). But what sense of identity is at issue?

Some scholars suggest that numerical identity is at issue. For example, after developing a view of our numerical identity (and noting no other relevant sense of identity), Walter Glannon expresses this thesis in the context of genetic *therapy*:

[Gene therapy designed to correct or treat a cognitive or affective disorder would be more likely [than gene therapy that has no direct effects on mental life] to alter one's identity. The manipulation of the relevant neurotransmitters or regions of the brain that generate and support mental life would directly affect the very nature of the mental states definitive of personhood and personal identity through time (2001, pp. 81–82).

Glannon applies this claim about identity to already existing persons and not merely to embryos and newborns (2001, p. 90). Presumably, the claim extends to *enhancements* that have comparably far-reaching consequences for someone's mental life.

But the thesis that enhancing a person's mental characteristics would create a numerically distinct individual is highly implausible. If the biological approach to numerical identity is correct, the thesis is obviously incorrect, because a single human organism survives such improvements of mental life. More importantly, the thesis is untenable on *any* contending view of identity. After all, the post-enhancement person will *remember* life before the intervention.⁷ Furthermore, most of his intentions and attitudes are likely to survive the enhancement (though some may change as they may in any one of us). Therefore, even if we grant Glannon's assumption that we are essentially persons (2001, p. 25), there's no reason to think enhancing an existing person's cognitive and affective abilities would affect numerical identity. Although the psychological approach understands our identity in terms of mental life, the criterion for identity is persistence of one and the same mental life—understood in terms of either psychological connections over time (e.g., memories of earlier experiences) or continuation of *basic* mental capacities (e.g., the capacity for consciousness)—not persistence of a mental life *with the same specific abilities and traits*. We might fairly reconstruct Glannon's reasoning as follows: He intuitively appreciates that a significant improvement in mental characteristics can affect *narrative* identity, the person's self-conception and self-story; but failing to distinguish the two types of identity, he fallaciously applies this intuition to numerical identity.⁸

Enhancement projects, if successful, are likely to affect one's narrative identity by affecting one's self-conception. A person who succeeds in becoming physically fit, or better looking, or more masterful in some valued activity will probably perceive herself somewhat differently than she otherwise

would have. This is true whether or not technologies are involved. But, as noted, some commentators feel that enhancement technologies raise special concerns. Are such technologies inherently problematic for reasons connected with our identity? We will consider in detail two major identity-related concerns.

V. THE CHARGE OF INAUTHENTICITY⁹

Invoking themes developed by Alasdair MacIntyre (1984, chap. 15) and Charles Taylor (1989, 1992), Carl Elliott has recently voiced concerns about enhancement technologies in relation to *authenticity* (1999). Elliott examines two competing ideals in American culture:

1. self-creation (or self-shaping—see note 6), with few if any constraints on what we can become, and
2. authenticity, which may imply some constraints.

Conceptualizing authenticity along the lines of Taylor, who understands it as *being true to oneself*, Elliott echoes a theme from MacIntyre in the following remark about this ideal:

We Americans talk about self-discovery, about finding ourselves, being true to who we really are. It is a kind of bad faith to pretend to be something that you're not—to discard your Jewishness, for example, or to move to the city and forget the folks back on the farm (Elliott 1999, p. 33).

But the ideal of self-creation is no less powerful, so “much of American life is about this kind of struggle, between trying to reconcile yourself to who you are, on the one hand, and trying to change it on the other” (Elliott, 1999, p. 33).

What, then, is the concern about enhancement technologies in relation to authenticity? Some people, as Elliott notes (2003, chap. 2), perceive enhancement technologies as *facilitating* their achievement of a more authentic self in projects of self-creation. For example, after taking Prozac for several months before discontinuing the medication, some patients have commented that only on the medication did they feel fully like themselves (Kramer, 1993, chap. 1). But Elliott's commentary as a whole suggests the judgment that at least some uses of enhancement technologies are inauthentic, as conveyed in this passage:

What is worrying about so-called “enhancement technologies” may not be the prospect of improvement but the more basic fact of altering oneself, of changing capacities and characteristics fundamental to one's identity. ... [Deep] questions seem to be at issue when we talk about

changing a person's identity, the very core of what the person is. Making him smarter, giving him a different personality or even giving him a new face—these things cut much closer to the bone. ... They mean, in some sense, transforming him into a new person (1999, pp. 28–29).

Whether or not I'm right that Elliott ultimately endorses these concerns, he gives expression to a type of worry that many people are likely to share. So does the President's Council on Bioethics: "In seeking by these [biotechnologies] to be better than we are or to like ourselves better than we do, we risk 'turning into someone else,' confounding the identity we have acquired through natural gift cultivated by genuinely lived experiences..." (2003, p. 300). The concern is that enhancement technologies threaten to alter the self fundamentally, thereby changing someone's identity, transforming him into a new person—and that such change is morally objectionable for being inauthentic.

Once again, it is important to clarify that the sense of identity at issue is narrative identity. If taking an SSRI changes your personality in important ways, *you* will change; it's not the case that you would literally be destroyed and replaced with another person, as would occur if numerical identity were disrupted. So, now that it is clear that narrative identity is at issue, what exactly is the basis for concern?

Much of the worry about creating a "new person" may derive, once again, from conflating the two senses of identity, as in this reasoning:

1. Enhancement technology X alters a person's identity.
 2. Altering a person's identity is highly problematic.
- Therefore
3. Enhancement technology X is highly problematic.

On one way of interpreting this reasoning, it is clearly fallacious. For premise (1) is true only if it appeals to narrative identity, while (2) is a safe assumption only if it appeals to numerical identity. Equivocation on the term "identity" invalidates the inference to the conclusion (3).

VI. THE CHARGE OF VIOLATING INVIOLEABLE CORE CHARACTERISTICS

A. Clarifying the Issues

On an alternative reading, however, the reconstructed syllogism does not equivocate because identity is construed in the narrative sense in both premises. Premise (1) remains true, but why accept (2) on this reading? What is wrong with changing someone's narrative identity, or self-conception, assuming she autonomously consents to the change? In the passage quoted

above, Elliott speaks of “capacities and characteristics fundamental to one’s identity” and “the very core of what a person is.” In a similar vein, in a section entitled “Hubris or Humility: Respect for ‘the Given,’” the President’s Council on Bioethics speaks of “a *human* ‘givenness,’ or a given humanness, that is also good and worth respecting...” (2003, p. 289).¹⁰ Elliott and the President’s Council are never sufficiently clear about what they mean by these evocative terms. Perhaps the most sympathetic interpretation is that some of a person’s traits are so basic to who he is that they represent a kind of “core” of his narrative identity; changing parts of the core would alter his self-narrative so profoundly that in a sense (that of narrative identity) the result is a different person. This charge of violating an inviolable core might be specified as an elaboration of the charge of inauthenticity: To violate one’s core is to fail to be true to oneself. Alternatively, it might be taken as a distinct moral objection unrelated to authenticity.

Either way, what is wrong with transforming someone into a new person by changing some trait at her supposed core? (Naturally, the answer “To do so would be inauthentic” would simply provoke the question, “How so?”) Further, how can we determine which characteristics comprise this supposedly inviolable core? Perhaps the President’s Council would direct us to identify characteristics that are “given” or that constitute human nature. But this directive would raise new questions about *how* to identify traits that are “given” or tied to human nature.¹¹ And are these supposedly core traits among the characteristics that people would like to alter with enhancement technologies? I suggest that the satisfactory answering of these questions will neutralize the present identity-related concern.

First, it is far from self-evident that changing “core” traits is morally problematic if a person autonomously consents to their alteration. The idea that some of a person’s characteristics are inviolable strikes me as beholden to a romantic, and rather implausible, notion of a “true” self whose defining traits are independent of the individual’s self-understanding and self-direction.¹² This idea of a true self seems most coherent if construed as a person’s *essence*, which is indeed independent of her choice—but the concept of essence is connected with numerical identity, which is not the sense of identity relevant to enhancement technologies.

Nevertheless, let’s assume, at least for the sake of argument, that each person has a narrative core. Which traits would belong to it? Presumably very basic traits connected with mental, social, and physical functioning—such as one’s capacities to think, plan, care for others, walk, communicate, eat, and sleep. Additionally, for each individual there may be more personal or self-defining traits that he considers part of his narrative core: being an intellectual, say, or a humanitarian. Still, it is one thing to claim that some trait lies within one’s narrative core, another to claim that it is impermissible to *alter* that trait—that the trait is *inviolable*. I will argue that characteristics

likely to be targeted or otherwise affected by enhancement technologies are not plausibly regarded as inviolable.

Consider, first, some relatively familiar means of enhancement and the traits they target. Imagine that Alfred, feeling middle-aged and mediocre, wants to get in shape and return his hair to its original color with Grecian Formula. Presumably, neither his current level of physical fitness, how he feels on a given birthday, nor his semi-grey hair lies within an inviolable core. Now consider Bethany, who is demoralized by her lackluster romantic life. Wanting to be more physically alluring, she is contemplating, in addition to vigorous exercise and a more healthful diet, breast enlargement surgery. Since she wants a surgeon to cut into her body, her enhancement project may appear more threatening to her “core.” But is it? While breast enlargement surgery raises significant prudential, moral, and social concerns (including several listed among the frequently discussed concerns at the beginning of this article), the surgery does not seem to put Bethany’s true self at risk. To see this, consider accidental paths to breast enlargement (say, gaining a lot of weight), or deliberate change that is similar in kind but more restoring than enhancing (e.g., breast reconstruction following double radical mastectomy). Surely these changes do not threaten someone’s core.

Perhaps the concern is more credible if qualified in this way: It is highly problematic to alter an individual’s core traits *for frivolous reasons*.¹³ One might agree that accidentally enlarging one’s breasts, or intentionally reconstructing breasts following mastectomy, is beyond reproach, while holding that intentionally enlarging normal breasts for something as frivolous as cosmetic improvement is highly problematic. But Bethany’s reasons for seeking this change do not seem frivolous. Surely her desire to improve a dispiriting romantic life is a substantial, legitimate interest.¹⁴ Similarly legitimate are Alfred’s ambitions (and those of two other characters we will meet in a moment); the same could be said of many people’s use of enhancement technologies. While perhaps some desires for major self-change are frivolously motivated—think of a rebellious teenager’s desire to have a long surgical scar just to impress his fellow rebels—this possibility does not justify preventing, or even discouraging, major self-transformation via enhancement technologies *across the board*. (It does, however, provide ample reason for individual practitioners, such as the surgeon approached by the scar-seeking youth, to decline certain requests for services.)

Now consider two characters whose enhancement projects target somewhat better candidates for core characteristics. Struggling with various life issues, Chris wants to become more outgoing and confident, especially in social settings, and less anxious and prone to second-guess his decisions and other people’s motivations. A veteran of years of psychotherapy, he would like to achieve these changes with an SSRI. At issue for Chris, then, are his personality and internal psychological style. Darian, an intense academic mulling over self-change in the year 2011, seeks genetic interventions that

will enhance her (average) memory and reduce by a couple of hours her (normal) need for sleep. In a passage quoted earlier, Elliott mentions intelligence, which includes memory, and personality as traits at, or close to, a person's core.

Let us therefore consider several candidates for core traits, including some just mentioned, that seem especially likely to be considered off limits, or inviolable, if any traits are:

1. internal psychological style;
2. personality;
3. general intelligence, including memory;
4. the need to sleep a certain amount of time;
5. normal aging;
6. gender;
7. being *Homo sapiens*.

For each of 1 – 7, our first question is whether it is plausible to hold that it is morally problematic to change the trait in any significant way (or, in the case of 7, to eliminate the trait). To repeat, I do not deny that it might be wrong or morally problematic to change an allegedly core trait for truly frivolous reasons—say, having a sex-change operation on a whim. My concern is the stronger claim that certain traits are inviolable in the sense that they should not be significantly altered even in pursuit of important life objectives. Second, if certain traits are inviolable, are enhancement technologies likely to affect them?

B. Considering the Candidates for Inviolable Core Traits

First, *internal psychological style*—for example, worried versus confident, suspicious versus trusting, dysthymic versus upbeat, and all gradations between these poles—is a trait that we may appropriately change. Indeed, psychotherapy often has among its aims such self-transformation. In cases of enhancement, of course, an individual wants to improve his psychological life beyond what is needed to qualify as healthy. But there is no reason to think that such a change would violate an untouchable core, for there are no grounds for thinking a particular psychological style is obligatory for a particular person.

Admittedly, truly extreme psychological changes that cut one off from reality would be problematic. If we could have a pleasant life only at the cost of profound, systematic misinterpretation of reality, few would consider that better for us than a reality-based, but less pleasant, life.¹⁵ Then again, while the possibility of hedonistic bliss while completely cut off from reality is important to science fiction and philosophy, it is not significant in the discussion of enhancements. To be sure, the sorts of changes in psychological

experience we are considering might affect one's perception of social reality—say, by affecting mood—but there is no reason to think the individual's resulting perceptions would be unreasonable, much less deluded. And, even if in some rare cases an enhancement technology distorted perceptions alarmingly, this would hardly suggest that internal psychological style was an inviolable core characteristic. It would simply suggest that some very drastic changes to this characteristic would be problematic and perhaps unacceptable.

Is *personality* a better candidate for an untouchable characteristic? Elliott suggests as much, and I have noticed in conversation that confirming opinions are not uncommon. But, in clear light, personality appears no more plausible a candidate than internal psychological style. When someone has an unattractive or self-defeating personality—say, overly cynical and sarcastic, or buffoonish, or excessively shy—we generally applaud his or her efforts to make positive changes. Admittedly, some personalities that are not considered the most attractive are closely linked with moral virtues and, therefore, might be better left untouched; thus, a modest and very sincere individual might not sparkle at receptions. Nevertheless, the close association in certain cases between virtues and (from a mainstream perspective) less-than-ideal personalities should not obscure the appropriateness of certain enhancements in personality. Let us also acknowledge that truly extreme changes in personality may create problems for social relations, as associates may no longer know how to relate to the “new” person. But realistic scenarios do not involve such drastic changes, and their logical possibility does nothing to show that deliberately changing one's personality is inherently problematic. How to explain, then, the tendency to believe one's personality is untouchable? Perhaps the term “personality” reminds us of “person”—and the idea of changing the latter creates vague worries about disrupting identity, stemming once again from a failure to distinguish numerical and narrative identity.

How about *intelligence*: memory, analytical ability, imaginativeness, social and introspective perceptiveness and so on? Well, attentive parents try to improve their children's intelligence all the time, with preschool, stimulating home environments, educational games, and other mind builders. Today retired persons are encouraged to keep mentally active by reading, playing a musical instrument, doing crosswords, and the like. And, between the early years and old age many of us try to improve or maintain or intelligence by reading a lot, playing challenging games, limiting television and alcohol consumption; some believe the music one listens to also matters. No one objects to these enhancements of intelligence.

One might respond that these examples of innocuous intelligence promotion are not really examples of enhancement. Rather, they are measures that enable someone to reach or maintain her full level of intelligence, with which she is *born*. But, of course, prenatal nutrition and the presence or absence of noxious chemicals in the mother's bloodstream can greatly affect

the fetus's later prospects for mental functioning. So the objection is more plausible if it appeals to the full level of intellectual potential as determined by one's original *genome*. But to take one's original genome as essential to one's "true" intelligence seems overly reductionistic, for two reasons.

First, genes interact constantly with the environment to determine our capacities, other characteristics, and level of functioning. There would seem to be no good reason to treat one's genome as more fundamental to one's intelligence than the interaction between one's genome and the environment (Buchanan, Brock, Daniels, & Wikler, 2000, p. 160). Consider this analogy. My genome has always encoded the potential to learn languages. I grew up where mostly English is spoken, so I speak English fluently. Had I died as a fetus or newborn, or had I been lost and raised by baboons, I would not have spoken any language despite my genetic endowment. Both factors, my genes and my environment, are crucial to my language-speaking ability. A corresponding judgment about intelligence is plausible. Notwithstanding your excellent genome, had your diet and other environmental factors made you profoundly mentally retarded, you would not have been highly intelligent. Intelligence involves certain *capabilities* (which, before adulthood, are relativized to age), not mere *potential*, which is why it would be nonsense to say that someone had been an intelligent fetus.

Second, our genome changes over time, due to spontaneous mutations, so to favor our *original* genome over all the later versions would be arbitrary. McGee puts it well:

[W]hat looks like a stable matrix—this "genome" we're all trying to protect—is actually a complex matrix of interactions in three trillion cells, many of which have taken up small mutations. Walking in the sun ages your skin because it affects your genetic makeup. Radiation and the chemicals in water effect changes in the germ-line and somatic cells. Even the air that you breathe is chock-full of ingredients that change the supposedly stable "blueprint" of genetics (1997, p. 118).

Even if our genome deserved priority over our environment and counted as part of our inalienable core, it would be more sensible to treat our *present* genome as crucial. After all, if some lucky mutation greatly increased my intelligence, presumably the new intellectual baseline would count as more relevant to my core than my original baseline. Inasmuch as genetic enhancement of intelligence would give me a new baseline, it would not violate my core; it would reconstitute it.

One might object that, unlike the lucky mutation, genetic enhancement of intelligence violates one's core because it is a deliberate product of human agency. "Mother Nature may mess with Mother Nature," one might say, "but *we* shouldn't mess with Mother Nature—or at least certain parts of her, like genes coding for intellectual capability." But why not? Note that the

objection still assumes, implausibly, that one's genome is fundamentally important while environmental factors are not. They are equally important, so we should bear in mind that no one objects to deliberately introducing environmental factors that promote intelligence.

My interlocutor, however, could take a different tack: "I agree that the aim of improving someone's intelligence is not objectionable per se. What is objectionable is the *means* of deliberately changing one's genome." But if genes and environment interact constantly to determine one's intellectual ability, and deliberately manipulating the environment to improve intelligence is acceptable, why should a different, possibly more efficacious means to the same laudable end be problematic? My interlocutor might again invoke the concept of a core, claiming that genetic interventions alter our core whereas environmental influences do not. But this is mistaken, for both genetic and environmental interventions affect the properties of our brain.

I therefore conclude that the case for regarding intelligence as a core trait off limits to enhancement technologies is unpromising. But *the need to sleep a certain amount of time*, which is equally a function of brain structure and functioning, seems no more promising as a candidate for an inviolable characteristic. One's need for sleep can be modified in ordinary, unobjectionable ways. Some people find that vigorous exercise such as running or deep relaxation techniques such as meditation can modestly reduce their need for sleep; no one objects to these means. Moreover, as with intelligence, the fact that genetic interventions work directly on the genome is unimportant. So the need to sleep is no better than intelligence as a candidate for an inviolable trait.

Is *normal aging* a better candidate? Whereas genetic alterations of intelligence or the need to sleep aim at *changing the degree* of a universal human characteristic, genetic interventions to prevent normal aging would aim to *eliminate* what we have always regarded as a universal human characteristic. Aging, one might contend, is an essential part of any recognizable human life. We should therefore not permit genetic interventions that attempt to "enhance" individuals by keeping them from aging.

This argument assumes that the elimination of aging is possible in principle. So, in claiming that aging is "essential" to human life, it presumably understands this term in the normative sense of inviolability. One difficulty of assessing this normative claim is the difficulty of imagining a human life in which one *never* aged—in the familiar sense involving gradual bodily deterioration.¹⁶ But, if one never deteriorated, and avoided sudden causes of death, one could live hundreds and hundreds of years—though presumably at some point the Grim Reaper would catch up with one with a fatal accident, murder, or perhaps boredom-inspired suicide. Although I would not find the prospect of living 500 or 1000 years attractive, surely some people would. If a demand emerged for the development of an anti-aging genetic

technique, then those seeking it might be conveying the view that aging is not normatively necessary. But, frankly, I do not know how to determine whether aging is an inviolable characteristic.

But even if we agreed that aging is inviolable, that would hardly cast doubt on efforts to *slow or delay* aging. Understood thus, anti-aging genetics would appear to be of a piece with other technologies that change the degree or specific expression of some characteristic such as intelligence or the need to sleep. More broadly, such a technology would be of a piece with medicine and the field of public health, which strive in innumerable ways to postpone our deaths. In the twentieth century, life expectancy in the U.S. increased about thirty years, due largely to advances in these two fields (President's Council on Bioethics, 2003, p. 165). Thus, even if aging is an inviolable core trait of human beings, living no more than some specified number of years is not. It appears, then, that the prospect of genetic interventions to delay aging remains in good standing.

Is *gender* a better candidate for an inviolable core characteristic? Probably most of us take our gender as central to our narrative identities. One might even hold that someone's gender is essential in the strict metaphysical sense, that a person is essentially of a particular gender so that no one of a different gender at another time could be numerically identical to that person. The President's Council on Bioethics suggests this stronger essentialist claim: "[W]e will have to take sexual identity seriously as given with our body. Every cell of the body marks us as either male or female, and it is hard to imagine any more fundamental or essential characteristic of a person" (2003, p. 69).

But this essentialist thesis is put in doubt by the experiences of some transgendered persons. An individual who grew up in my neighborhood had a sex-change operation in his thirties. For many years he was male both biologically and psychologically—that is, in terms of his self-conception. At some point in late adolescence or early adulthood, Chris began to regard himself as “really” female. Years later he became certain of this transformation, had a supporting surgery, and socially became “Christine.” Well, Christine remembers being male. By all reasonable criteria, she was, years ago, a person of the male gender. But she changed, becoming female.

There are two main ways to counter my assertion that Chris(tine) changed genders, but neither is promising. First, one might claim that Christine is still male—her self-conception, social persona, and current genitalia notwithstanding. Gender, one might insist, is a purely biological matter determined entirely by one's original genetic constitution. But, while one might insist on using the terms “gender,” “male,” and “female” in this way, this usage does not capture the more nuanced sense of these terms that is customary today. I am using these terms such that it is conceptually possible to change genders. (Note, in any case, that denying the possibility of changing genders would undermine the present identity-based concern about

“sex-change operations”: If they don’t *really* change someone’s gender, they don’t threaten a core characteristic.)

Assuming that first line of argument is unsuccessful, we may accordingly assume that Christine is female. A distinct argument that might underlie the insistence that no one can change genders appeals to a criterion of numerical identity according to which one’s original gender is essential in the strictest sense, as the President’s Council suggests. That would mean that Chris is essentially male, making the female Christine numerically distinct from him. So Christine’s apparent memories of pre-surgery life are delusional; it was not one and the same human individual who had been male, but rather a predecessor who was replaced—without dying?—by a successor who wrongly takes her pre-surgery “memories” to be self-representing. But this implication is extraordinarily implausible. It is far more sensible to allow that someone who was male became female.

Cases like Christine’s show that, while gender may be crucial to someone’s narrative identity *at a particular time*, gender is not criterial to numerical identity. Moreover, because one can change one’s self-conception of gender, the latter can be dynamic with respect to narrative identity. Gender is not an inviolable core characteristic, so neither genetic nor surgical interventions that would change a person’s gender are cogently criticized on this ground.

Let us finally consider a characteristic that may seem an especially plausible candidate for an inviolable core trait: *being Homo sapiens*. George Annas, Lori Andrews, and Rosario Isasi (2002) have recently called for an international treaty prohibiting reproductive cloning and inheritable genetic modifications, claiming that use of such technologies would not only violate a core trait, but also threaten human rights. The authors contend that being human, or *Homo sapiens*, is the fundamental basis for human rights (2002, pp. 152–153). Reproductive cloning and inheritable genetic modifications would be

crimes against humanity of a unique sort: they are techniques that can alter the essence of humanity itself (and thus threaten to change the foundation of human rights) by taking human evolution into our own hands and directing it toward the development of a new species, sometimes termed the ‘posthuman’ (2002, p. 153).

That is, these uses of biotechnology would “alter a fundamental characteristic in the definition of ‘human’” (ibid), an intrinsic moral wrong (violating an inviolable core characteristic). Further, they “would likely lead to the creation of a new species or subspecies of humans” (2002, p. 161)—*posthumans* who, being different from the rest of us, may well become victims of slavery or genocide or, believing themselves superior, may perpetrate these crimes against humanity (2002, pp. 161–162).

In view of this argument, consideration of species membership is of broader ethical interest than the discussion of allegedly inviolable traits. Nevertheless, and despite my believing that every step in the argument is mistaken, I will focus on the thesis that being *Homo sapiens* is an inviolable core trait.¹⁷ (I set aside concerns about creating a new *subspecies*, because the individuals in question would be of our species, retaining what the authors consider the basis of human rights.)

It might seem obvious that being *Homo sapiens* is one of our inviolable core characteristics. What could be more fundamental to human beings—especially if we are essentially human animals, as the biological view claims—than membership in our species? Note that this point concerns not only our narrative identity but also our essence in the strict sense related to numerical identity (despite my earlier claim that only narrative identity was at issue with enhancements). For several reasons, however, matters are not so obvious.

First, creating—or transforming someone into—a member of a new species would not necessarily entail that the individual is nonhuman. The resulting individual would presumably be a hominid even if not *Homo sapiens*. Maybe all hominids, or at least some hominids in addition to *Homo sapiens*, are properly regarded as human. It's not obvious to me that, for example, the hominid species from which *Homo sapiens* evolved were not human.

Second, the biological view need not claim that we are essentially *Homo sapiens*. It might claim that we are essentially hominids. Or, despite my earlier characterizing this view as asserting that we are essentially *human* animals, a proponent of this view might hold that we are essentially primates or members of some broader grouping of animals. The key claim of the biological view is that the criteria for our numerical identity and essence are biological, not psychological, a claim that permits further discussion about the (possibly vague) boundaries of our fundamental kind.

Third, it is debatable whether genetic interventions on an existing member of our species or on *Homo sapiens* gametes could produce an individual of another species. Arguably, one's species membership is determined by that of one's biological parents, in which case the phenotype that results from genetic interventions is irrelevant to species membership. If so, genetic interventions would not touch, much less threaten, the putatively inviolable trait of being *Homo sapiens*.

One might respond that we can easily imagine the introduction of an additional, artificial chromosome whose effects include the inability to reproduce with unaltered humans and produce fertile offspring. On one conception of species distinctions, individuals with the additional chromosome would constitute a new species (assuming they could reproduce with one another and produce fertile offspring). Thus, these genetic interventions would cross the species boundary, according to the argument.

It seems to me, however, that these individuals would still be “human” in any sense that might be normatively important. Rather than construing this as a case of violating an inviolable core trait, I would stress *the risk to reproductive capacities*: These individuals would be unable to reproduce (and produce fertile offspring) with the vast majority of human beings. This and other risks might warrant our restricting such a genetic enhancement “package”—the adding of the artificial chromosome—to adults capable of providing informed consent, if the risks are not so severe as to justify prohibition. Note, by the way, that if an adult underwent this intervention, she would presumably remember her pre-intervention life—undermining any claim that numerical identity has been disrupted. And her informed, voluntary decision would suggest that the anticipated transformations would not violate any traits defining her narrative identity.

Taken together, these considerations cast significant doubt on the two-part thesis that

1. being *Homo sapiens* is an inviolable core trait,
2. which is likely to be threatened by certain realistically attainable genetic technologies.

In conclusion, the thesis that certain core traits likely to be affected by enhancement technologies are inviolable appears somewhat dubious. Even if aging, for example, is a promising candidate for an inviolable core trait, enhancement technologies are unlikely to target aging itself. Rather, they would target one’s *current expected lifespan*, which is certainly not inviolable. As for membership in our species, there are substantial reasons to doubt that this is an inviolable core trait; there may also be good grounds for doubting that any (real-world) enhancements would transgress the species boundary. Meanwhile, the other five characteristics that appeared on our list proved to be weak candidates for inviolable characteristics.

But, again, this critique of the inviolability thesis does not imply that any and all efforts to change core traits, assuming there are core traits, are beyond reproach. I remain open to the possibility that it is wrong, or at least highly problematic, to change core traits *for frivolous reasons*—for example, seeking to make oneself less intelligent through neurosurgery just because one thinks this would be funny. My speculation is that if actions of this sort are morally problematic, that is because they demonstrate insufficient self-respect. Naturally, an adequate defense of this position would require further argument that the class of actions in question is morally problematic, that we have obligations grounded in self-respect, and that such obligations provide the basis for criticizing this class of actions. Being merely open, rather than committed to, this thesis and the suggested grounding in self-respect, I will not pursue this important issue further in this article.

VII. CONCLUSION

Enhancement technologies arouse a wide variety of moral concerns. Some, such as those about safety and distributive justice, are familiar and relatively easy to articulate. Others are less familiar and more difficult to articulate. The identity-related objections to enhancement technologies fall within the latter group.¹⁸

Many people are inclined to believe that enhancement technologies threaten individuals' identities. Fewer clarify the sense of identity in question or exactly how it is threatened. This article has distilled from existing literature two identity-related objections:

1. the charge of inauthenticity and
2. the charge of violating inviolable core characteristics.

We found that one line of reasoning (expressed earlier in syllogistic form) that can motivate either of these charges rests on an equivocation on the term "identity"—or, equivalently, on a conflation of numerical and narrative identity. A more promising line of reasoning focused on narrative identity and the charge of violating inviolable core traits. When examined closely, however, this reasoning proved suspect, for the sorts of transformations likely to be sought with enhancement technologies are unlikely to affect traits that are plausibly considered inviolable.

NOTES

1. My thanks to two anonymous reviewers.

2. See, e.g., the articles in Parens (1998). I discuss these concerns in DeGrazia (2000) and, at greater length, in DeGrazia (2005, Chap. 6).

3. Regardless of how the concept of medical need is elaborated (see, e.g., Daniels and Sabin, 1991), there will be ambiguous cases where it is difficult to determine whether a condition qualifies.

4. For a classic statement, see John Locke (1694/1975, Bk. 11, Chap. 27). For more contemporary literature, see, e.g., Grice (1941); Shoemaker (1963); Wiggins (1967); Williams (1970); Perry (1972); Lewis (1976); Nozick (1981, Chap. 1); Parfit (1984); Johnston (1987); Korsgaard (1989); Unger (1990); Schechtman (1996); Olson (1997); Martin (1998); Baker (2000); and McMahan (2002).

5. Schechtman (1996) and Blustein (1999) appreciate the distinction but, in my view, underestimate the practical importance of numerical identity.

6. Where an individual is willing, and fortunate enough to be able, to engage in "self-creation"—the deliberate shaping of one's own characteristics and/or life direction—she is not only the protagonist of her life-story, but also its first author. For an excellent discussion of self-creation, see Glover (1988, Part II).

7. More precisely, he will have detailed memory impressions of life before the intervention and there is no good reason to deem these systematically erroneous (as they would be if numerical identity had been disrupted) for suggesting that he is remembering *bis own* experiences. A similar qualification applies to the next sentence.

8. If I understand the authors correctly, a similar conflation of numerical and narrative identity muddies the conceptual waters in Buchanan, Brock, Daniels, & Wikler (2000, pp. 84–86).

9. This section and the following one draw significantly from DeGrazia (2005, Chap. 6).

10. The Council also refers frequently to “human nature” and to “what it means to be a human being” (see, e.g., 2003, pp. 7–8).

11. Francis Fukuyama contends that “the most significant threat posed by contemporary biotechnology is the possibility that it will alter human nature and thereby move us into a ‘posthuman’ stage of history,” (2002, p. 7). He explains human nature in terms of allegedly unique cognitive faculties (2002, pp. 140–143), but I was unable to find an argument as to why it would be problematic to alter these faculties. If, as he thinks, linguistic capacity is part of human nature, why would a genetic intervention that moderately improved someone’s linguistic capacity be problematic?

12. Arguably, as Eric Saidel suggested to me, appeals to authenticity are similarly beholden to this implausible notion. I would disagree, contending that the demands of authenticity resolve into familiar moral requirements concerning honesty and autonomy. See DeGrazia (2005, Chap. 3).

13. Maggie Little suggested roughly this amendment in discussion.

14. I am not claiming that her *means* of pursuing this interest are unproblematic. Indeed, I think cosmetic surgery’s close connections with suspect cultural norms (e.g., women as desirable only if their bodies conform to certain standards) should give us significant moral pause; questions about the autonomy of such choices are also worth pressing. Here I simply rebut the identity-related charge that breast enlargement surgery violates an inviolable core for frivolous reasons.

15. This is roughly the point of Nozick’s experience machine thought-experiment (1974, pp. 42–45). See also President’s Council on Bioethics (2003, Chap. 5).

16. Of course, it’s *contradictory* to suppose that someone could stay alive and never age in the sense of acquiring more birthdays.

17. A few quick replies to the larger argument. First, it is debatable whether being human is the same as being *Homo sapiens*. Evolution has featured more than ten hominid species, out of one of which our species evolved. Were another hominid species alive today, we might naturally regard them as another kind of human. If so, then creating a new hominid species through biotechnologies would not create a nonhuman type of person and, therefore, would not threaten any moral claims based on being human. Second, I do not believe that being *Homo sapiens* or even being hominid is the fundamental basis of our human rights. I think the most fundamental basis is our being sentient, and consequently having interests. Certain of our rights depend on specific human-typical traits, as the right to respect for autonomy rests on our capacity for autonomous choice. But even this right is not founded on species membership per se; some members of our species lack this capacity. Moreover, our right not to be harmed unnecessarily is plausibly regarded as grounded in sentience—the capacity that makes harm possible—and therefore as shared with other sentient animals. Third, the empirical claim that permitting reproductive cloning and inheritable genetic modifications is likely to lead to the emergence of a new species strikes me as highly doubtful. Reproductive cloning would have no tendency to do so because it would not change genotypes. Genetic enhancements, meanwhile, would bring about changes in our gene pool that are miniscule in comparison with the entire human genome. One might reply that adding an artificial chromosome could cause the resulting people to be unable to have fertile offspring with the rest of us, thereby creating a new species according to one conception of species differences (a point I will discuss in the text). Even if this came about, though, there is no reason to think these people would be deprived of their legal rights; as the offspring of human parents, they would have the same rights as the rest of us under current law. And the idea that such “posthumans” would come to feel superior and go on to enslave or commit genocide against unenhanced humanity seems the stuff of science fiction.

18. So do concerns, verging on theology and not addressed here, regarding our proper attitude towards the natural order and our place in nature. For an exceptionally good discussion, see Sandel (2004).

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