

Epistemological and Moral Problems with Human Enhancement*

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We are going to give neither an intensional definition of the concept of human enhancement nor are we going to attempt to build a collection that contains all the possible interventions (extensional). Our analysis draws on an overall meaning of human enhancement as scientific and technological progress that expands the possibilities of human action and reduces its dependence on natural or cultural predetermined constraints, allowing the human condition to be changed via science and technology. Human enhancement thus refers to extended cognitive skills, extended sensory capacities, a significant increase in life expectancy, mood modulation as well as new capabilities that might be provided to healthy individuals.

Rather than dealing with the definitional issue, we aim to sketch out the epistemological and moral underpinnings of the debate on human enhancement in order to provide a demarcation of issues regarding human enhancement. Ultimately, the aim of this issue is to go beyond sterile disputes between supporters and detractors of human enhancement. There are two main difficulties with the current debate. For one thing, it is coined by a discussion of the ambiguous notion of the “natural”. The second problem is that the debate centres around naïve attempts to speculate about technology-

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based visions of the future. We advocate a reoriented debate that can complement and inform ongoing work in science and societal debate.

In the remainder, we want to address the following six points that are important for the debate on human enhancement:

1. It is emphasised that we should move past the contemporary discussion on human enhancement and go beyond sterile disputes between its supporters and detractors.
2. It is necessary to interpret the term “human enhancement“ in a very wide sense in order to include not just the interventions themselves, but the social and cultural dimension as well.
3. Technologies are not just tools that humans use in order to interact with and experience the surrounding world. They also are means of mediation that shape their world and themselves.
4. The normative – as a way of relating to a standard – is presupposed by our lifeworld and cannot be understood from a purely naturalistic stance.
5. Ethics and law are two forms of the normative. Their relation is analysed in the specific case of human enhancement.
6. Human enhancement affects society at large. Thus it requires public debate and stands in need of regulation.

A discussion of aforementioned points makes it possible to reframe the debate on human enhancement and to achieve a new level of discussion.

As human enhancement roughly refers to numerous interventions that can change in significance depending on the intention with which they are undertaken, we do not want to start with an intensional definition. For example, an intervention to increase the height in an adolescent with normal growth-hormone (GH) secretion whose parents are short is categorized as an enhancement. Instead, the same measure performed on a patient with documented GH deficiency that would result in the same height would be categorized as a therapeutic intervention, thus providing a counterexample to an obvious attempt at an essentialist definition.

The problem with the extensional definition is the heterogeneity of possible interventions, which are based on knowledge from various disciplines. The

scientific knowledge required for the various interventions for the purpose of human enhancement is plentiful, ranging from neuroscience to biology, from engineering to nanotechnology, etc.

The problem therefore seems to move from the definition to the issue of categorization of the interventions of human enhancement. The question thus becomes: how do we categorize human enhancement? How do we decide that a certain intervention is an enhancement? How do we establish that interventions as diverse as a prosthesis, a drug and a technological support as an implant may all be labelled as enhancements? In recent discussion, different scholars have taken different stances on the issue of categorization: some think that our categorical framework should be based on function. Others believe that it should instead be based on the intention. Yet others are convinced that it should be based on a combination of structural properties and function. Thus the issue of definition calls for a consideration of the issue of categorization. In fact, if we think in terms of categorization issues – that is, in terms of comprehending the functional character of human enhancement – then we can improve the quality of debate *vis-à-vis* the standard discussion of human enhancement that we find in mainstream philosophy, which is focused on definitional issues. On the one hand, it will be much harder then to take an essentialist point of view with respect to the definition of human enhancement. On the other hand, it will also be possible to overcome the difficulties entailed in the distinction between therapy and enhancement that rests on a kind of "between Scylla and Charybdis". Both of which bring problems. The essays included in the present issue integrate concrete, empirical examples and try to move forward the discussion on human enhancement based on these examples. By presenting new empirical findings on the topic, these essays examine how these can lead to philosophical problems.

1. Moving beyond the Pro-Enhancement / Anti-Enhancement Frame

Human enhancement is one of those topics that is likely to polarise. In other words, the first immediate reaction is an emotional (or ideological) reaction between those who are for human enhancement and those who are against human enhancement.

These preferences are supported in various ways by referring to topics such as human dignity or hubris that play a role in the argument. These arguments, however, do not always appear to be in agreement with other beliefs that are also shared by those who support them. There are then two problems: the problem of consistency and the need to clarify conceptually the novelty entailed in emergent technologies. A top-down

approach, that is characteristic of bioethics, has been adopted as a solution. But even this approach has soon been proved to be insufficient. In brief, the shortcomings of a bioethics approach consist in the mere application of established principles a priori that are recognized as valid in all circumstances without regard to the specificity and situatedness of each intervention. Overlooked in this approach are several factors that contribute to determining the specificity of the context. Below, we give a brief but systematic exposition of elements that have to be taken in account in analysing interventions that aim at improving human traits or capacities according to Straub (Straub et al. 2012): 1. the subject; 2. the object; 3. the regard in which the object is enhanced (behaviour, body, personal traits, etc.); 4. the knowledge required for the specific enhancement; 5. the criterion for successful enhancements; 6. the beneficiary of the enhancement; 7. the procedure that is used to bring about the enhancement; 8. the means that are used; 9. the intended and unintended consequences.

A further difficulty – highlighted by approaches that are critical of the bias inherent in the simple risk assessment and instead promote a multidisciplinary approach called ELSA (Ethical, Legal, and Social Approach) – is that very often we do not have to deal with the concrete improving intervention. We have to deal, rather, with the objectified visions developed in trials and laboratory prototypes. Since the situation is strongly marked by a lack of knowledge, it is difficult to use the criteria of risk assessment.

The analysis of these briefly mentioned points along with the issue of categorization and definition of improving interventions can help to develop a more balanced approach, that goes beyond ideological and emotional responses to the debate on human enhancement.

2. Humanities, Science and Technology

In our intention, reframing the debate on human enhancement also means to address the issue known as the “Two Cultures”. The Two Cultures is the title of the first part of an influential Lecture by the British scientist and novelist C. P. Snow. In 1959, Snow pointed to the growing gap between the ‘two cultures’, between the truth claims of hard science, on the one hand, and the truth claims of the humanities that more closely reflect the human lifeform on the other. More generally speaking, we can say that the term “human enhancement” is the name that has emerged to refer to the open issues between humanities, science, and technology since the mid-nineties. Still, the idea that it is a fundamental feature of the human being to extend the limits

imposed on her by nature or culture and to enhance her traits and capacities is an idea as old as the reflection about human nature itself. Starting from the Italian humanism of the 14th Century, this idea has a strong normative orientation towards education and self-education. This idea spells out that no one ought to remain as nature or the particular social situation has shaped her. Instead, everyone ought to develop beyond their naturally and socially imprinted shape (Pico della Mirandola, 1486/1965).¹

At the same time, the scope of scientific and technological research has expanded immensely since the early modern period. Since scientific knowledge has been able to translate its laws and principles into devices that “act” on behalf of human beings or enhance them, philosophy has been faced with new issues. During this development, technology and economics have been playing a major role in mediating scientific knowledge (Nida-Rümelin 2005). In the twentieth century, the progress in the field of science and technology has sharpened the debate about human enhancement.

The knowledge that has developed in different fields of science and technology and the linked deployment of potential interventions with possible social relevance has undermined the established order and has given the debate on human improvement an increased magnitude.

The two orders in which theoretically and epistemologically Kant divided the human being are no longer so rigidly separated. According to Kant, man belonged to two orders. The first order is ruled by nature, it is characterized as something “given”. On this order human beings are hardly able to make modifications. The second order is the order ruled by human beings. Acting on this order, a human being can change herself and in so doing she is lead both by

¹ In this connection, a passage in Pico della Mirandola’s *On the Dignity of Man* (1486) comes to mind. He quotes God as saying the following:

We have given to thee, Adam, no fixed seat, no form of thy very own, no gift peculiarly thine, that thou mayest feel as thine own, have as thine own, possess as thine own the seat, the form, the gifts which thou thyself shalt desire. A limited nature in other creatures is confined within the laws written down by Us. In conformity with thy free judgement, in whose hands I have placed thee, thou art confined by no bounds; and thou wilt fix limits of nature for thyself. I have placed thee at the center of the world, that from there thou mayest more conveniently look around and see whatsoever is in the world. Neither heavenly nor earthly, neither mortal nor immortal have We made thee. Thou, like a judge appointed for being honourable, art the molder and maker of thyself; thou mayest sculpt thyself into whatever shape thou dost prefer. Thou canst grow downward into the lower natures which are brutes. Thou canst again grow upward from thy soul’s reason into the higher natures which are divine. (Pico della Mirandola, 1486/1965, pp. 4–5)

her intention to achieve a goal (pragmatic domain) and by moral principles (moral domain), which she recognizes as true². Interestingly, such a moral domain is not doomed to be subjective and arbitrary in scope. Its laws have the same status as the laws of nature already according to the Kantian account.³

Since technology and science have allowed us to intervene on the order of nature (that is, both at the level of the human body and at the subpersonal level as in the case of the neural and genetic mechanisms that are modified in order to get cognitive enhancement or life extension) the boundaries between these two orders have become blurred.

The existing framework that produced a divide between “what is given” and “what can be made” was assumed as normatively valid without anything in the way of profound reflection and has been accepted as obvious until recent time. Now it seems insufficient in giving orientation toward the emergence and diffusion of new emerging technologies aiming at human enhancement.

As the demarcation line between the two orders moves, we should rather ask the question whether such interventions raise novel ethical questions that previously did not exist. If these interventions have precedents, which have legitimized their use, then it is clear that there are no new problems.

Indeed, we may say not only that improvement is allowed. It may even be socially accepted, such that all our institutions and social practices presuppose it. The results of these interventions are valued especially when they can be related to the work that is exerted in order to achieve that result.

The question whether new ethical issues are raised becomes controversial if interventions are practiced on the order of nature – in an area, that is, in which humans have had a limited capacity to intervene.

Today it is incumbent upon us to judge quickly and to decide upon new practices that people may gradually want to adopt. We are looking for criteria that help us to decide about issues of enhancement. The first criterion has to do with self-determination. Social sustainability and ethical permissibility, however, are also relevant in this context.

As an example, some conditions that are considered necessary for the attribution of personhood are the same that are invoked as criteria for deciding

² “Physiological knowledge of the human being, systematically formulated (anthropology), can exist either in a physiological or in a pragmatic point of view. - Physiological knowledge of the human being concerns the investigation of what *nature* makes of the human being; pragmatic, the investigation of what *he* as a free acting being makes of himself, or can and should make of himself” (Kant, 1798, 7, p.119).

³ “The starry sky above me and the moral law within me” (Kant, 1788, 5, p. 161).

the permissibility of human enhancement interventions. Conditions that need to be met, according to some scholars, in order to ascribe personhood could be considered as the definite ethical boundaries for permissible human enhancement interventions. If self-consciousness, a capacity to weigh reasons for action and a capacity to develop a life plan are preserved, then there are no major concerns that would forbid human enhancement.

The concern that through these new practices human enhancement may furtively promote values other than those we feel bound to (e.g. justice, equity, solidarity, etc.) is at the core of our efforts to identify new criteria for permissible enhancements.

It is not easy to provide ready-made criteria that are appropriate in all cases. The practices of human enhancement call into question existing conceptual frameworks and values, that we have adopted so far, for understanding and regulating the democratic fruition of the results of scientific research. Even if the techniques are applied for therapeutic purposes, they do not just restore a function of the body or the mind, but strengthen and improve human traits and capacities that transcend any disease. Thus a mere bioethics approach turns out to be insufficient. Even a human rights approach does not prove reliable as a criterion because the principles of human rights can hardly be adapted to fit the context of human enhancement. Overall, human enhancement calls for some consideration of our system of knowledge and its articulation in scientific and moral knowledge.

In this scenario it becomes necessary to determine the role of scientific knowledge in the process of understanding and then regulating human enhancement.

Nobody would doubt the fact that we live in an enlightened society in which we rely on scientific knowledge. Rather, the question is the following. Do we believe that scientific knowledge is the sole form of knowledge upon which the work and design of human beings relies? Or do we believe, instead, that there is a right on the part of humans to establish the goals and objectives of their development, which belong to a different domain than logic and the ethos of scientific rationality?

At stake is not only the demand to adopt an interdisciplinary approach – which is also very important to understand and judge with respect to human enhancement. Rather, the settlement of scientific and moral knowledge as well as the demand of an integrative judgment that could harmonize moral and scientific judgment are at stake. It is, rather, an epistemic challenge: to confront the truth of the life-world that can lead individuals to choose a

technology to enhance themselves and the truth of science. This is the reason why the clarification of the relationship between humanities, science and technologies is an integral part of a new analysis of human enhancement that also benefits from the field of metaethics.

3. Desire and Technology

Nowadays, the knowing subject has to deal with distributed knowledge (Verbeek, 2006). The knowledge is distributed in what may be called interacting networks of agents, where the circulation of information brings about the possibility to contextualize the world. In this sense, the human enhancement technologies have expanded systems in which information circulates, becoming more and more complex and ever more autonomous (Floridi, 2013). By virtue of this network structure new technologies are therefore not only forms of instrumental rationality defining the relationship between humans and the world. They also have an impact on how humans feel and think themselves, affecting their emotions and imagination. “Technologies and moralities happen to be indissolubly mingled because, in both cases, the question of the relation of ends and means is profoundly problematized” (Latour, 2002, p. 248). As “desire”, “morality”, “technology” are not immune to one another, technological tools are related to values not only depending on how they are used, but also on how they are planned and designed. Accordingly, the social and moral significance of technology cannot be reduced to the (right or wrong) use of it. All along technology can lead to an amelioration in human development as well as to bad use or to human hubris (Cerqui, 2002; Coeckelbergh, 2009). Thus, technologies are not merely “neutral” instruments, but expressions of human sensibility and rationality, i.e. of an activity of conscious planning, which is oriented by the goals it pursues.

4. Realism and Normativity (Criticism of Naturalism)

Agency is the centre of the human condition. Our reframing of the debate on human enhancement also focuses on the normativity that is at the core of acts of human enhancement.⁴

⁴ This has been pointed out by Straub et al. (2012), but also much earlier by Pico della Mirandola (1486/1965).

We may stick to the Kantian distinction mentioned earlier – i.e. the distinction between what nature *does* and what human beings *can* do and *ought* to do. This would suggest that the human domain comprises human capabilities, social mediations and established practices. The human condition reaffirmed the desire to define ends.

In the mainstream discussion on human enhancement, it seems that these elements of the human condition are no longer required. For a variety of historical and conceptual reasons the debate on human enhancement has mainly been developed from a naturalistic stance.

Naturalism is a thesis about the world that may be articulated from an ontological (or metaphysical) or from an epistemological perspective. The former states that all that exists is natural. If, in contrast, the thesis is an epistemological one, then it states something different. It purports that everything we know is known through scientific and technological means. The latter form of naturalism can be called as *scientia mensura*. Sellars provides us with a paradigmatic meaning of this kind of naturalism: “In the dimension of describing and explaining the world, science is the measure of all things, of what is that it is, and of what is not that is not” (Sellars 1956, 173). This means that science and technology are the measure of all possible knowledge. Sympathetic with this position is a kind of moral epiphenomenalism. According to this position, moral knowledge has no truth. This moral epiphenomenalism comes in various forms, e.g. relativism, emotivism, and constructivism, etc. In the case of moral emotivism, moral knowledge is nothing but the expression of moral feelings. This reductive approach and moral emotivism cannot explain our ordinary moral language and reasoning. Neither can it explain the fact that we learn which actions, policies and social settings are ethically good or fair.

If we accept these epistemological conditions, it becomes understandable how it is possible to fall into a kind of naturalism according to which scientific theories are not only true but also the unique source of truth. This position leads to a deflationism in ethics. According to this kind of reductionism, the ethical and social sustainability is downgraded until it coincides with the merely technically feasible.

It is against this naturalistic background that we aim to reframe the debate. In particular, with respect to the quest for normativity, we want to suggest that metaethical arguments that affirm the reality of moral knowledge together with the reality of scientific and technological knowledge can provide a reliable

basis for debate. This would help us to engage in a discussion with the mainstream in the enhancement debate, that is naturalistic and reductionist. In doing so, we hope to reorient the enhancement debate and to put it from its head back on its feet. We hope to redirect some of the attention away from the laboratories and research centres and back to our lifeworld. Furthermore, we hope that the debate will not be given up to purely economic criteria.

Starting from these remarks, it is possible to state that metaethical reflexion may support our aim to make room for a normative-ethical stance in dealing with ethical issues that arise from scientific and technological knowledge which aim at enhance human traits and capacities.

5. Ethics and Law

The debate on human enhancement reveals how important and productive it is to have a broad perspective on different phenomena if the understanding and regulating technology is concerned. Both ethics and law are expressions of normativity that influences the way people interact with each other and engage with their environment. Even if ethics and law are guided by different regulatory ideas, ethics and law are in many cases in line with each other – but not always. Thus, ethical normativity must not be confused with legal normativity. Indeed, in some cases the results of an ethical analysis may be totally out of tune with the legal analysis. For example, in the case of an emergency it may be unlawful to cross the street without regard for approaching traffic. But this does not seem to be unethical. In other cases some result of ethical analysis can be implemented in legal analysis. As a consequence, ethical reflection has a crucial role to play in elaborating legal instruments. In fact, some results of ethical analysis can be very valuable for legal analysis. But some others have just precautionary meaning or are just expressions of moral preferences. These are legally uninteresting, even if they remain ethically relevant.

In any case, the implementation of ethical ideas to regulatory ends raises the question how ethics and law relate to one other (Nida-Rümelin, 2013).

Regarding the relationship between ethics and law some scholars have argued that there is an ongoing process of “ethicalization of law” (Vöneky et al., 2013). They have described this ethicalization as follows:

One could describe this notion by the phenomenon that legal rules are being supplemented more and more by ethical, non-legal standards / norms. We are

not stating that this is a new phenomenon per se; but we think that we can see it becoming more frequent. There are more and more clauses in legal norms which give ethical (non-legal) norms some validity in a legal order: We can find such “opening clauses” for instance in the Framework Programme of the EU; according to it, “all research shall be carried out in compliance with fundamental ethical principles”. Secondly, we can also observe an increase in the establishment of ethics committees on a legal basis. There are more and more areas in public international law, European law or national laws where the decision of an ethics committee is necessary before any action is allowed – for instance in drug trials on human beings. A third area of the ethicalization of law can be found when one looks to non-binding ethical codes of conduct, which are submitted by private organisations (Vöneky *et al.*, 2013, p. xi).

With regard to this complex phenomenon, we believe that this step can be achieved only through interdisciplinary work performed together with legal scholars. Technology becomes one of the forms through which individuals learn to think and desire. Therefore, its regulation has to take two things into account. For one thing, it has to consider the possible retardation of technological developments due to increased research and production costs, which may result from their inherent technological complexity. Furthermore, it has to pay heed to the limited market for technological innovations. The legal system needs to provide solutions for various problems. Regulation may allow the substantial benefits of such kinds of application to reach the market earlier. They may also be available to a larger public. At the same time, it may provide the technical tools and criteria to prevent or, at least, mitigate the (socially) undesired effects of human enhancement.

Ethical normativity depends on people who formulate normative claims or act according to them. At the same time, normativity provides us with true claims about events, objects and relationships that shape the world we live in. In ethics there is no Archimedean point from which we can derive what is right and wrong by following the top-down process of applying the developed principles. According to Julian Nida-Rümelin, both the Kantian categorical imperative and the utilitarian principle should be rejected on that count. Unfortunately, the implementation of these principles cannot give us normative guidance because of the different context-sensitive properties cannot be generalised into a comprehensive ethical theory (see Nida-Rümelin, 2007).

Ethics has different purposes. It is to provide conceptual clarification. (Consider, e.g., the aforementioned issue about the categorization of human

enhancement measures). Another function of ethical analysis is to make our beliefs and values consistent.

6. Politics and Policy

Science and technology is of great economic interest. They have the potential to quickly modify individual and collective lives that no other human artefacts has. Neither law nor religion (which are other human artefacts) have produced so rapid and widespread transformations in human life. These transformations have disseminated into social behaviour without making too much clamour, rather by gripping the desires, the imagination, and the human expectation.

Human enhancement technologies act on emotions as well as on the structure of rationality. In doing so, it is therefore clear that they cannot simply be considered as something to be permitted or forbidden. As human enhancement technologies feed new hopes and create a social demand, make available new tools both for individuals and society, foster threats and concerns, and present risks, they need to be dealt with in a public discussion and not only in academic circles. This can be addressed only in a democratic debate as pointed out by Coenen et al. (2011). Thus philosophical reflection on technology and philosophical reflection on democracy are two joint themes. This is so not just because the technology is an increasingly important tool that allows citizens to access political life, but also for a more significant reason. Only a public, democratic debate can develop policies which allow for a legitimate use of human enhancement technologies that improve the human condition. The debate about human enhancement shows exactly this. That is, it shows how true scientific culture can develop through a public forum that allows for open and free discussion.

7. The Contributions

The volume is opened by Volker Gerhardt's essay. It addresses fundamental philosophical questions and clarifies and deepens the theoretical premises at the core of the philosophy of technology. Gerhardt devotes his attention to the question how philosophy could be disentangled by an allegedly irresolvable contrast between culture and nature. According to him, technology, which plays such an important role for no other species than for humans, paradigmatically shows this evolutionary development of nature, viz. that in order to emerge it has to become something other than itself.

In their contribution, Nikil Mukerji and Julian Nida-Rümelin approach the debate about human enhancement from a general angle in order to make a case for a moderate take on the issue. Based on general conceptual reflections, meta-theoretical considerations and a brief *tour de force* through some of the most important motifs of the enhancement debate, they criticise sweeping conclusions both in favour of and against human enhancement. Instead, they hold that we should consider the ethical issues which arise in the context of enhancement with an open mind and on a case-by-case basis.

The third essay of this issue is by Christopher Coenen, who examines transhumanism from a historical perspective. He investigates the narratives on which it is based and holds that they can explain why our societies are currently so fascinated by the perspective of enhancing human nature. Coenen believes that the “historical interpretative approach” he advocates may, as he puts it, “give rise to a new reflexive stance on current enhancement discourse”.

Barbara Henry aims to develop an account of post-human enhancement which makes it possible for us to envision a future society that is made up of human beings, human-machine hybrids and artificial beings which can be viewed as free and equal. In doing that, she distinguishes the idea of the “post-human” from that of the “trans-human”. The former is meant to refer to symbols and phenomena different from those that are associated with the “trans-human”. She believes that in order to reframe the debate on human enhancement we have to guarantee, as she puts it, the “widest possible conditions of non-hegemonic or expansive conscious contextuality of legislative and decisional systems”.

David-Jack Fletcher’s essay homes in on transhuman technologies that target and aim to eradicate disabilities. He thinks that the idea of the eradication of disabilities assumes a secular humanist notion of human perfection. And he problematizes the fact that the use of transhuman technologies may lead to “hierarchies of life”. Disabled individuals, he fears, may be moved to the bottom of that hierarchy and may even be considered nonhuman. In response, Fletcher offers an alternative view of disability. On that view, “disabled” individuals may not have the same mode of existence as “abled” individuals. But their mode, he holds, may be seen as just as valid as those of the “abled” individuals.

Jan-Christoph Heilinger discusses anthropological arguments about human enhancement. In current debate these arguments are taken to be controversial. Heilinger, however, takes a contrary stance. Based on a

contractualist and pragmatist starting point, he develops an account of anthropological arguments and argues that they can play an important role in determining the ethical status of measures of human enhancement. He emphasises, however, that the content of anthropological arguments is rather minimal and points out that they are ill-suited for supporting a radically sceptical stance on enhancement.

The essay of William Sims Bainbridge addresses the theme of personal identity. In particular, he examines the means of modern communication and computing technologies. He argues that these possess a profound transformative potential and may give us the option to adopt multiple identities, e.g. online avatars, semi-autonomous intelligent agents, etc.

Roberto Mordacci examines three categories of enhancement: cognitive supports and education, neural cognitive enhancers (e.g. drugs) and technological cognitive enhancers (e.g. implants, extended minds). Based on the Parity Principle, he argues that there is no morally relevant difference between the three categories. What we aim at preserving is not the biological status quo of a person's mind. Rather, we aim to preserve personal identities. On that assumption, then, general objections to cognitive enhancement are unsupported as even traditional enhancement measures have their drawbacks and may threaten an agent's autonomy and personal identity.

Anna Gotlib's contribution focuses on virtual realities and the reasons for expanding the idea of human embodiment in order to accommodate them. Gotlib notes that virtual realities play an increasing role for the self-image of human beings. She criticises the prevalent conception of identity-constituting embodiment and argues that virtual environments, such as *Second Life*, can help us to expand our idea of embodiment and to deepen our moral vocabularies of the self.

Filippo Santoni de Sio, Philip Robichaud, Nicole A. Vincent discuss the question when human beings should enhance themselves, focusing particularly on the case of cognitive enhancement. Cognitive enhancement, they argue, is impermissible when it is used in the context of an activity that would lose its entire point due to the enhancement. However, they embrace cognitive enhancement in two sorts of cases: firstly, in what they call "practice-oriented" activities (e.g. of a recreational nature) and, secondly, in certain goal-directed activities (e.g. high-potential jobs), where much is at stake in the way of moral value. Comparatively safe cognitive enhancers, the authors argue, may even be obligatory in the latter case.

Stefan Lorenz Sorgner takes up and criticises Julian Savulescu's suggestion that we may have a moral obligation to increase our children's chance in life by enhancing them. He rejects the "principle of procreative beneficence" which, as Sorgner explains, forms the basis of Savulescu's reasoning and seeks to show that it represents a violent attack on human beings who disagree with it. In conclusion, Sorgner proposes a number of reasons for a principle of procreative autonomy that he takes to be more plausible than Savulescu's principle of procreative beneficence.

Fox Swindells' piece discusses the issue of economic inequality as it relates to human enhancement. As Swindells explains, considerations about economic inequality often lead to a call for the prohibition of enhancement technologies. He believes, however, that a prohibition of that sort would be ineffective in preventing potential harms and may furthermore prevent many positive consequences that enhancements may bring. Swindells also argues against free-market allocations of enhancements as they may lead to unacceptably unequal access. He concludes that governments should step in and provide regulations as well as public funding for enhancement technologies in order to ensure that they are distributed fairly.

After that, we present two case-studies, one by Nathan Van Camp and one of Alberto Pirni. Nathan van Camp surveys the current bioethical and politico-philosophical debate about the so-called 'liberal eugenics'. He argues that the liberal argument for enhancement has internal flaws. However, the liberal anti-enhancement argument, he holds, suffers from the same defects. The latter, he explains, necessarily entails a "preemptive dehumanization" of enhanced life forms, while the liberal argument for enhancement appears to reduce non-enhanced individuals to a "wrongful life". Van Camp concludes, therefore, that the issue of human enhancement cannot be satisfactorily addressed in a liberal conceptual framework. Alberto Pirni offers a survey of the current debate on human enhancement with an eye to its interdisciplinary characteristics. He draws on Aristotle and, in particular, on his theory of justice and fairness that is developed in the *Nicomachean Ethics* to sketch a proposal of his own. It leads up to a synthetic list of possible points of criticism that may apply to the topic.

Last but not least we have Pericle Salvini's piece in which he proposes an alternative framework for human enhancement and illustrates it using the example of robotics technologies. His view is based on the notions of reciprocity and mediation. Salvini argues in favour of the following view. Enhancement, as he sees it, is a result of the way in which technological and

scientific mediation alters the structure of the network of reciprocity that characterises “human presence”. Technological mediation, he believes, may turn the “reciprocity of presence” into a unilateral relation that forestalls any form of response.

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