

## IS NEURO-ENHANCEMENT UNNATURAL AND DOES IT MORALLY MATTER?

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**Abstract.** Neuro-enhancement refers to the use of applications of modern neurosciences to make people better – smarter, happier, more sociable etc. This paper consists of analyses on claims concerning unnaturalness of neuro-enhancement. In what sense, if any, is neuro-enhancement unnatural? If neuro-enhancement is unnatural, is its unnaturalness morally noteworthy? Four possible senses of naturalness are analyzed: naturalness as normality, naturalness as suitability, naturalness as belonging, and naturalness as familiarity. None of these interpretations offers sufficient support for the view that neuro-enhancement is morally problematic because of its unnaturalness.

**Keywords:** neuro-enhancement, unnaturalness, normality, suitability, belonging, familiarity, ethics, philosophy

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### 1. Introduction

Neuro-enhancement refers to the use of applications of modern neurosciences to make people better – smarter, happier, more sociable etc. For example, many students (according to some studies over 5%) and their professors (according to some studies up to 20%) in the United States use drugs such as modafinil (brand name for example Provigil), methylphenidate (brand name for example Ritalin) and dextroamphetamine (brand name for example Adderall), to increase their recall, attention span, problem-solving ability, and ability to focus on cognitive tasks. The use of these drugs for neuro-enhancement is off-label; the users suffer neither from narcolepsy nor from Alzheimer disease for which the drugs were originally developed. The users just want to enhance their cognitive performance (Goodman 2010:146–148; Lane 2009). Neuro-enhancement also includes manipulation of moods and emotions. Some people who do not need antidepressants or other psychotropic drugs to sustain or restore their health use, for example, fluoxetine

(brand name for example Prozac) to enhance their subjective emotional well-being and improve their social life (Kraemer 2010). The scope of the term 'neuro-enhancement' is not restricted to the use of drugs. Neuro-enhancement may, at least in theory, take place also through surgeries, and magnetic or electrical stimulations of the brain (Glannon 2006:38).

This paper consists of analyses on claims concerning unnaturalness of neuro-enhancement. In what sense, if any, is neuro-enhancement unnatural? If neuro-enhancement is unnatural, is its unnaturalness morally noteworthy? Moreover, should neuro-enhancement be, because of its unnaturalness, morally rejected or restricted?

The question about the unnaturalness of neuro-enhancement is connected to claims concerning its effects on authenticity. One of the central arguments against neuro-enhancement is that it threatens the authenticity of persons, or at least the authenticity of their minds' contents or their achievements. In other words, neuro-enhancement has been seen to violate the ideal of being true to oneself (Kraemer 2010 and Erler 2010).<sup>1</sup> Even though the ideal of authenticity is quite attractive, it requires further clarification which is often provided by appeals for natural and unnatural (see for example Kraemer 2010 and Erler 2010). However, the terms 'natural' and 'unnatural' are ambiguous (Cooley and Goreham 2004, Siipi 2008, and Bergin 2009), and thus in need of clarification in order to be useful in authenticity discussion.

The question concerning unnaturalness is not relevant to the ethics of neuro-enhancement merely through the authenticity discussion. Rather, the question is interesting also as such and actually quite prevalent in neuroethics (see for example Goodman 2010:155, The President's Council on Bioethics 2003, and Buchanan 2009). This is due to the methods of neuro-enhancement being, first, ethically interesting, and second, obviously quite artificial and non-natural in the sense of involving highly advanced technological and medical applications. However, since the use of highly advanced technological and medical applications is not morally undesirable as such, the crucial question is then twofold. Is there something in the context of neuro-enhancement that makes the use of highly advanced technological and medical applications morally suspect? Or is neuro-enhancement unnatural in some other way (i.e. in a way that does not refer to the use of highly advanced technological or medical applications) that is morally relevant?

## **2. Ambiguity of unnaturalness**

The terms 'natural' and 'unnatural' are highly ambiguous. The term 'unnatural' may mean the use of highly advanced technology (Angermeier 2000:374), but it may also refer to human impact in a more general sense (McKibben 1989:55, 58–59 and Soper 1995:15). Further, unnaturalness can be interpreted, for example, as

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<sup>1</sup> Some writers have, however, argued that neuro-enhancement is a good method for self-fulfilment and it enables one to attain his or her authenticity (Parens 2005:35–36).

violation of nature or at least disharmony with it (Elliot 1997:117 and Verhoog et al. 2003:35, 37), being against God's will (Radcliffe Richards 1984:72 and Cooley and Goreham 2004:52), being abnormal (Radcliffe Richards 1984:70 and Cooley and Goreham 2004:48, 50), being an artifact (Dipert 1995:121, Elliot 1997:123, and Katz 1997c:122) or being foreign (Mill 1969:400 and Harris 1985:186) and not belonging to someone or something (Siipi, forthcoming).<sup>2</sup> The question about the unnaturalness of neuro-enhancement, thus, is to a great extent a conceptual question concerning possible interpretations of the term 'unnatural' in this context.

The terms 'natural' and 'unnatural' are not merely ambiguous in the sense of having multiple different meanings, they may also refer to many kinds of entities including objects and their traits, activities, other events, and states of affairs (Siipi 2008:73–75). This also applies to neuro-enhancement. The claims on its unnaturalness may be taken to concern either the enhancement procedure or its outcome (or both). Moreover, the claims concerning the unnaturalness of the procedure may involve references to drugs ("Ritalin is unnatural") or their use ("It is unnatural to use Ritalin to enhance one's cognitive capacity"). Similarly the claims on the unnaturalness of the outcomes may concern the state of mind, thinking, mood, emotion, personality, or achievements resulting from neuro-enhancement. One's evaluations of the naturalness of different aspects of one procedure need not be similar. One can perfectly well conceive an unnatural procedure (a caesarean section, for example) not affecting the naturalness of its outcome (the baby). Similarly, claims on the unnaturalness of an emotion, for example, do not imply any particular view concerning the unnaturalness of the whole person or the procedure giving rise to causing that emotion.

Conceptions of naturalness may further differ with respect to naturalness being seen as an all-or-nothing issue or a continuous gradient. Being an artefact, for example, is usually considered an all-or-nothing issue. Beings and objects either are or are not artefacts (see for instance Lee 1999:83 and Hilpinen 1992:60). On the other hand, naturalness as independence from human beings (or from advanced technological and medical applications) is often seen as a continuous gradient. Entities can be more or less natural in this respect, and totally human independent and totally human dependent entities are rare if not totally absent from the earth (see for instance Elliot 1997:82, 131, Lo 1999:253–254, and Lee 1999:52–53). A wild berry, for example, is in this sense more natural than an herbal drug which is, in turn, more natural than a synthetic drug.

### 3. Natural as normal

At least at first glance, neuro-enhancement may seem unnatural simply because it reaches beyond what is normal for human beings. This is conceivable, first,

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<sup>2</sup> For further meanings of "natural" and "unnatural" see Siipi 2008, Bergin 2009, and Coolay and Goreham 2004.

because the whole idea of enhancement seems to rest on the distinction between it and the treatment of diseases (Kraemer 2010, Lev et al. 2010:102–103); second, normality is a quite commonly accepted goal and much used term in medicine (Gräsbeck 1995:66); and third, the term ‘natural’ is often interpreted as ‘normal’ (Radcliffe Richards 1984:70, Sagoff 1985:113, Priest 1997:263 and Cooley and Goreham 2004:48, 50). According to this idea, treatment aims to restoring or sustaining a normal (and in that sense natural) states, whereas the goal of enhancement is to make betterment beyond and above the normal and natural (The President’s Council on Bioethics 2003 and Lev et al. 2010:103).

This kind of view on the unnaturalness of neuro-enhancement, however, is problematic for several (mostly conceptual) reasons. Even though the above description is somehow appealing and manages to catch some ideas prevalent in the enhancement discussion, it is necessarily unclear and obscure, since many of its key terms and distinctions are questionable. The distinction between enhancement and treatment is far from clear (Sparrow 2010:117, Lev et al. 2010:102–103, The President’s Council on Bioethics 2003, and Chan and Harris 2007), and it is unclear partly because the distinction between sickness and health (Räikkä 1996 and Räikkä and Launis 1992) as well as the concept of ‘normal’ (Tiles 1993:734, Gräsbeck 1995:66, and Räikkä 1996:354) are obscure. As Robert Sparrow (2010: 117) puts it, “what precisely the ‘normal’, beyond which the therapy becomes enhancement, consists in: is it the capacities of the ‘average’ human today; species typical capacities; or merely absence of disease?” Since neuro-enhancement is conceptually and in practice closely tied to medical treatment, it is wise to look for conceptual clarification in the sphere of medicine.

As noted by Sparrow, normality is often understood as a statistical issue. Normality is then related to being usual or common. Normal entities are average with respect to their properties. If the property in question can be mathematically measured, normal entities usually fall close to a mean or median. (Levy 1980:195, Wachbroit 1994:580, Gräsbeck 1995:67, and Wachbroit 2003:52.)

Statistical normality is sometimes a norm and goal in medicine. Normal height, for example, is a statistical concept and children in danger of differing considerably from that norm are quite commonly treated with synthetic hormones. Often the lower limit of statistical normality sets a minimum requirement and anything beyond it is found medically normal. For example, physical or mental conditions lowering the life expectancy or intelligence considerably below the average are usually understood as diseases or defects. Physical and mental conditions increasing intelligence or life expectancy beyond the average, on the other hand, are usually not considered diseases even though they are statistically rare.

Understanding naturalness as statistical normality does not offer much clarification for claims concerning the unnaturalness of neuro-enhancement. Nor does it offer support for neuro-enhancement being morally undesirable because of its unnaturalness. What is statistically normal varies to a great extent in different places and especially across the time. The variation is dependent for example on nutrition, education, scientific knowledge, and medical interventions available

(Chan and Harris 2007:1 and The President's Council on Bioethics). Moreover, not all statistically normal conditions are desirable, and medical procedures on statistically normal conditions are often seen as forms of treatment – not as enhancement. In western population, for example, dental caries is statistically normal. Despite that it is a disease, and despite its commonness, prevention and care of dental defects caused by it are not a form of enhancement, but a form of treatment. It is then worth asking, following Sarah Chan and John Harris (2007:1), how the average of the world of today (or any particular point of time) could set the distinction between treatment and enhancement, and between what is natural and unnatural. From the point of view of statistical normality, the mere distinctions between treatment and enhancement and between what is natural and unnatural seem highly questionable.

Sometimes in medicine the term 'normal' is understood to refer to the non-pathological or an absence of disease (Hacking 1990:162–164 and Dupre 1998). When understood this way, normality has at least two possible interpretations. According to the first interpretation, the term 'normal' refers to a medically ideal state, condition, or being (Tiles 1993:734 and Gräsbeck 1995:72). A normal weight and normal blood pressure, for example, are ideal states or conditions (and not statistically normal in many parts of western world). Similarly the phrase 'normal heart' may refer to an ideal heart that does not have any defects or imperfections (and which thus may, strictly speaking, be non-existent or exist just as an ideal model in the thoughts of medical professionals). Normal as a medically ideal state, condition, or being is normative. It offers a goal for medical treatment and health care (Gräsbeck 1995:72).

Second, normal as non-pathological may refer to functional normality, which has been described by Robert Wachbroit (1994:581) as follows: "If we know the biological function of an entity, then we are already able to characterize its biologically normal state since any description of its 'function' refers to its actions in its biologically normal state." Function is here understood as an entity's biological 'task'. In other words, the function of *x* refers to the way in which *x* contributes to a complex activity of the whole (Wouters 2003:635). Functional normality of a being or its part means that it does not have malfunctions; in other words, it works properly as it should. For example, a functionally normal heart circulates blood in the body, whereas a functionally abnormal heart fails to do this or does it too efficiently (Wachbroit 1994:580–582 and Dupre 1998:4). Thus, also functional normality is ideal and normative. It is closely related to normality as a medically ideal state, condition, or being (and may even be considered its instance) and works as a goal in health care.

Normality as non-pathology (either as an ideal state, condition, or being, or as functional normality) is hardly compatible with the idea of enhancement. If a normal state, condition of beings means the same as an ideal state, condition, or being, then the normal also designates the best possible state, condition, or being. It is conceptually impossible to make anything better than the best, and thus, normality as an ideal state, condition, or being leaves no room for enhancement.

No weight or blood pressure can be better than the normal one, and certainly no heart is better than the medically ideal heart. Analogously, if ‘normal’ means fulfilling ones function, there is no better than normal. If a heart manages to circulate blood in the body according to its function, it is not possible to make the heart function any better. Thus, from the point of view of normality as non-pathological (either as an ideal state, condition, or being, or as functional normality) enhancement is unconceivable. This is due to the normal-pathological distinction being an all-or-nothing issue. Since everything that is not pathological is normal, there are no possibilities of doing better than normal. Thus, normality as non-pathological (at least in the described sense) does not offer tools for criticizing neuro-enhancement for its unnaturalness.<sup>3</sup>

Since neither statistical normality nor non-pathological normality (as ideal normality or functional normality) do not offer satisfactory interpretations for what is meant by the unnaturalness of neuro-enhancement, one might suggest that naturalness and normality in this context refer to what is typical of healthy human beings (Sparrow 2010:117). Naturalness might then be understood to consist of two factors: non-pathology and statistical average. Thus, statistically rare, but non-pathological states, conditions, and beings would count as abnormal and unnatural. However, this type of view of unnaturalness fails to have moral power. Rare non-pathological states, conditions, or beings are not morally undesirable as such. Quite the contrary, many of them (such as exceptionally high intelligence, very good eyesight, and exceptional beauty) are admirable and desirable. Thus, we are driven back to the question, why it would be morally problematic to use highly advanced technological and medical applications in order to achieve rare but desirable non-pathological states, conditions, and beings.

#### 4. Naturalness as suitability

In the context of neuro-enhancement the term ‘typical’ can be interpreted as referring to “species typical capacities” (Sparrow 2010:117, Chan and Harris 2007:1, and Buchanan 2009:142). ‘Species typical capacities’, moreover, can be understood to mean what belongs to so-called human nature, or what is in other

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<sup>3</sup> One might claim that the above argument concerns only those non-pathological states that can be seen as ideal states between two extremes. A blood pressure, for example, can be too high but also too low, and similarly a heart may circulate blood insufficiently but also too efficiently. However, as noted before sometimes the upper limit for normality is missing. Normal eyesight and normal intelligence, for example, are any eyesight and intelligence that pass certain minimum requirement for normality. Exceptionally good eyesight and exceptional intelligence are not seen as pathologies but desirable conditions. However, normality as non-pathology does not – as such – leave conceptual room for enhancement even in these cases. If anything that is non-pathological is also normal (either ideally or functionally), it does not matter for *normality as non-pathological* how far beyond the minimum requirement the properties in question are. Exceptionally good eyesight, for example, is not normal in a statistical sense, but it is still normal in the sense of being non-pathological.

ways suitable for human beings. The terms 'suitable' and 'belonging' are, of course, closely related and ambiguous. They have aesthetic meanings and they may refer to acceptable forms of social behaviour. In the latter sense of the terms, it is not suitable to laugh at funerals, and shorts and bikinis do not belong to fine restaurants. In the former sense, a painting may be more or less suitable for its place in a living room and a certain type of fabric or colour may belong to a certain type of antique furniture. These senses of suitability and belonging are, however, only very remotely related to naturalness.<sup>4</sup> Nevertheless, a claim about the naturalness of an entity may sometimes refer to its being suitable or belonging to someone or something.

When understood as a form of naturalness the term 'suitable' may refer to something being beneficial or harmless to someone or something (Siipi, forthcoming). A claim that hay is natural food for cows and horses (but not for human beings) refers to suitability in this sense. Hay is natural food for cows and horses because it is suitable for fulfilling their nutritional needs and thus beneficial and not harmful to them. Similarly, loud and aggressive games may be seen to be natural for little boys if they are seen to satisfy the boys' needs for physical and social exercise. As the examples clearly suggest, naturalness as suitability – as well as suitability in general – is relational. No entity as such is natural or unnatural in this sense, but only with respect to some other entity.

Naturalness as suitability is intimately related to need satisfaction. Entities that tend to moderately satisfy one's needs are natural for one, whereas entities that lead into inadequate or superabundant need satisfaction are not suitable and thus not natural for one. (Matthews 1988:121 and Häyry and Häyry 1989:186.) Hay, for example, is not natural food for human beings, since it does not sufficiently satisfy our nutritional needs. Thus, it might be argued analogously that neuro-enhancement is not natural for human beings, for it does not satisfy our needs but rather goes beyond need satisfaction. That neuro-enhancement is not natural for us in this sense does not, however, imply that it is unnatural. Rather it can be seen as something distinct from need satisfaction and deprivation, and thus falling outside the scope of the terms 'natural' and 'unnatural'.

However, not all agree on neuro-enhancement being insignificant to need satisfaction. Some authors have objected to neuro-enhancement on the basis of its risks and possible undesirable consequences (Lev 2010:104, 107, Lane 2009, President's Council on Bioethics, and Glannon 2006:49–50). According to this line of thought, neuro-enhancement is unsuitable and in this sense unnatural for human beings, since even though the idea of enhancement is appealing, in practice the methods of neuro-enhancement lead or are at least likely to lead into harm and suffering. The drugs used in neuro-enhancement may have serious side-effects,

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<sup>4</sup> Connections may, nevertheless, be found. Both aesthetic and social suitability may depend to a great extent on what we are used to and on what is familiar to us. Interestingly, it has been stated that the term 'natural' can also sometimes be interpreted to mean familiar and customary (Mill 1969:400, Harris 1985:186, and Räikkä and Rossi 2002:33). Naturalness as familiarity will be further discussed in the sixth section of this paper.

and enhancement of memory, for example, may decrease creativity and even the general well-being of a person (Lane 2009, President's Council on Bioethics, Glannon 2006:49–50, and Chan and Harris 2007).

The safety and possible risks of neuro-enhancement is, of course, an integral part of its ethical evaluation. Nevertheless unnaturalness arguments referring to negative side-effects are always conditional and dependent on possible and actual effects of the enhancement methods. Therefore, they are also weak in the sense that they cannot be read as a categorical argument against all forms of enhancement. Even if all the current methods of enhancement had serious consequences, it might be possible to have methods that are far less risky in the future.

Moreover, naturalness as suitability is not restricted to mere need satisfaction, but it also concerns human life in a wider sense. Naturalness as suitability can be connected to the idea of defining (one's) naturalness as being or acting according to (one's) purpose (Crowley 2010:74), nature (Radcliffe Richards 1980:65), or function (Priest 1997:363). All these notions can be seen to rely on the Aristotelian concept of 'telos' (Crowley 2010:74, Radcliffe Richards 1980:73, and Priest 1997:365). Telos means that for which a being strives; it is the primary goal and the proper end of a being's development (Aristotle, *Physics* II.9, 199a9-12:15–19 and Priest 1997:365). The closer to its telos a being has developed, the more perfect and flourishing it is (Aristotle, *Nicomachean Ethics* I.7, 1097b:1–7 and Benn 1998:161–162). Naturalness as suitability is related to telos, since entities that move a being closer to its telos can be described as being natural for it. In other words, what is natural for something is what is constructive for its well-being and encourages it to flourish (Radcliffe Richards 1984:73 and Crowley 2010:75.) Flourishing and well-being should not here be understood merely to refer to need satisfaction or lack of pain and illness, but they should be understood more widely. An entity can move a being away from its telos without causing it pain or depriving its needs. If a pig, for example, were genetically engineered in a way in which it lacked the need and interest in rooting, keeping it in place with no possibilities of rooting would not cause it pain nor be against its needs. Nevertheless, if the pig's telos is seen to include rooting, in other words, if the pig is seen by its nature, or even by its function and purpose, as a (living) being that roots, both the described type of pig farming and genetic modification would be against the telos of the pig and thus unnatural for pigs in that sense. (Hauskeller 2005:64, 69 and Lee 2004:165.)

Thus, an unnaturalness argument may be understood as a claim that neuro-enhancement is unnatural, since it hinders individuals from reaching their telos. This is conceivable, since Aristotle identifies the telos of human beings with eudaimonia. Eudaimonia is usually translated as happiness. It is, however, not any kind of happiness, but happiness resulting from intellectual exercise and "exercise of natural cognitive faculties, most importantly, faculty of reason" (Wedin 1999:51). Theoretical activity is then seen as the highest and most choice-worthy end for human beings (Wedin 1999:51). It might, thus, be asked whether neuro-enhancement (and especially neuro-enhancement of cognitive capacities) is a

short-cut which hinders its user from the intellectual struggle and effort which is an integral part of intellectual exercise and reasoning. In other words, is neuro-enhancement problematic, since it hinders us from genuinely using our cognitive capacities?

On the other hand, it may well be asked why neuro-enhancement should be seen as a form of cheating or as a short-cut. Why could it not be seen as a way of reaching closer to our telos? Enhancement – as indicated by the term itself – makes people better. It can thus also be seen as a way of moving individuals closer to their telos and eudaimonia. In other words, neuro-enhancement can also be seen as a way of enabling better exercise of human cognitive capacities and faculty of reason by freeing us from substantial cognitive constraints (Fröding 2010).

Third, it might be claimed that neuro-enhancement neither moves an individual closer to his or her telos and eudaimonia nor away from them. This is not to say that neuro-enhancement is insignificant from the point of view of telos. Rather it may be seen most relevant, for it may be claimed that neuro-enhancement changes the whole human nature and telos. The crucial question then is what this “human nature” is and why neuro-enhancement brings about changes in it and human telos.

### **5. Human nature and naturalness as belonging**

The term ‘suitable’ is related to the term ‘belonging’ and, as argued above, they are both related to naturalness. The scope of ‘belonging’, however, seems narrower than the scope of “suitable”. Not all entities that are suitable for *x* can be said to belong to it. Thus, it might be suggested that claims concerning the unnaturalness of neuro-enhancement, and especially the claim that neuro-enhancement changes human nature and telos, may be clarified by interpreting naturalness as a form of belonging. The idea is then that neuro-enhancement procedures or their outcomes (the enhanced capacities) do not belong to human nature.

Naturalness as belonging may be taken to refer to something being necessary and essential for something else (Siipi, forthcoming). According to this line of thought, human nature is “a set of characteristics that are common to all humans and that distinguish humans from other kinds of beings” (Buchanan 2009:142). These characteristics are necessary and essential for human beings in a sense that if any of these characteristics disappears, one is no longer a human being (Buchanan 2009:142 and Loux 1999). This interpretation of naturalness as belonging is different from the above idea (related to naturalness as suitability) of defining ‘natural’ as being or acting according to purpose (Crowley 2010:75), nature (Radcliffe Richards 1980:65), or function (Priest 1997:363). An entity’s being and acting according to its purpose, nature, and function is basically about making the entity perfect and flourishing, and about it becoming well. However, returning to the above examples, a pig that does not root is still a pig (although maybe not a perfect one). Contrary to being or acting according to purpose, nature, or function, naturalness as belonging concerns issues that do not only contribute to

the telos of entities, but that are necessary and essential for a pig to be a pig, for an human being to be a human being, and for any entity to be a type of entity it is. Thus the difference can be described as the one between *what* an object is and *how* it is (Loux 1999:281).

According to naturalness arguments referring to belonging and human nature, neuro-enhancement destroys or deforms something that is essential for human beings. In other words, neuro-enhancement is seen to make such great changes in individuals that they cannot be considered human beings any more (Alpert 2008: 65, President's Council on Bioethics 2003). This kind of view raises several questions. First, the whole idea of neuro-enhancement contributing to loss of something essential to human nature may be questioned. Are the changes achieved by the methods of neuro-enhancement (or at least by the current methods) really so considerable that it is justified to think that they change the whole nature of the enhanced individual? More strictly, does the neuro-enhancement of an individual hinder him or her from being a true human being?<sup>5</sup>

Second, let us suppose that the idea of neuro-enhancement leading into an essential change is accepted, why would such a change be morally undesirable? What is the source of the normative power of human nature? If human nature is merely a description of what is typical for human beings today, it is difficult to see what is wrong in changing it for the better – that is enhancing it. If, on the other hand, the source of human nature is somewhere else in telos or God-given orders, for example, it is worth asking why it would be reasonable to think that human nature as it currently prevails, is in accordance with this God-given order or telos and, thus, something that should not be changed for the better.

Third, the whole idea of human nature consisting of essential characteristics may be questioned. Are there really characteristics that all human beings share and without which one is not a human being? According to Allan Buchanan (2009: 142), human nature may also be understood more loosely to consist of a set of dispositions that almost all human beings share and that shape our behaviour across a wide range of human activities. However, loosening the requirements in this way does not take away the above problems. If human nature is seen to consist of characteristics typical of our species today, it is hard to see why it would be morally questionable to change it for the better (Fröding 2010). If human nature is seen to refer to some ideal state, it is inconceivable to believe that the current human characters happen to meet the requirements of that ideal state. In both cases, would it not be best – or at least acceptable – to enhance human individuals?

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<sup>5</sup> The same critique may be objected with the claim that neuro-enhancement of an individual turns him or her into an artefact (see for example Haraway 1997). The changes brought about by neuro-enhancement (at least from the neuro-enhancement of today) are not considerable enough to change a status of an individual from a non-artefact to an artefact. Being an artefact requires being a different type of entity than one's raw materials (Siipi 2005:74–75) and no such change in sortal descriptions can be seen to follow from neuro-enhancement.

## 6. Naturalness as familiarity

Naturalness as normality, as belonging, and as suitability does not offer morally powerful interpretations of the unnaturalness argument. Thus, one may be tempted to think that the discussion on the unnaturalness of neuro-enhancement actually consists mostly of resistance towards the odd and unknown. This is conceivable, since several writers have presented that sometimes the term 'natural' can be interpreted as 'familiar' or 'customary'. People tend to consider natural those entities to which they are accustomed and with which they are familiar. On the other hand, the term 'unnatural' is sometimes taken to mean 'uncustomary' or 'odd' (Mill 1969:400, Harris 1985:186, and Räikkä and Rossi 2002:33). The argument that women should stay at home – or at least attend to the housework – because women are by nature domesticated, is often based on this interpretation of naturalness. People were (and some still are) accustomed to women staying at home and taking care of housework, and thus women working outside home and men doing housework seemed rather unnatural for many people<sup>6</sup> (Radcliffe Richards 1984:65–66 and Häyry and Häyry 1989:184). Similarly, claims in the 19<sup>th</sup> century that travelling by train is unnatural were based on interpreting unnaturalness as that which is odd, uncustomary, and unfamiliar (Räikkä and Rossi 2002:33). Could the claims concerning the unnaturalness of neuro-enhancement, thus, be interpreted merely as claims about fear and resistance towards what is unknown and uncustomary? Our relations to other people are highly important to us and, therefore, the worries about changing their mental properties in novel ways may seem scary.

Generally speaking, since everything new, odd, and uncustomary is not undesirable, unnaturalness as unfamiliarity does not imply moral unacceptability. Similarly, since everything old and customary is not morally unproblematic, this form of naturalness does not imply goodness or desirability (Häyry and Häyry 1989:184, Häyry 1994:209, and Räikkä and Rossi 2002:33). This is easy to see from the above examples. Even though travelling by train and men attending to housework have been unnatural in the sense of unfamiliarity for many people, neither of the activities is or was morally wrong as such.

However, the above stated does not imply that naturalness as familiarity is morally irrelevant. That an entity is familiar to us implies that we know what to expect from it. In other words, if an entity is natural in the sense of being familiar to people, they have information and experience of the entity and of the possible risks related to it. Unnaturalness in the sense of unfamiliarity, similarly, implies a lack of knowledge and information about an unfamiliar entity and its possible outcomes (Krieger 1973:450, Madsen et al. 2002:271). Obviously, familiarity does not imply safety and unfamiliarity is not directly related to dangerous outcomes. Knowledge and information related to unnaturalness as unfamiliarity, however,

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<sup>6</sup> The assessment may seem tempting because of an equivocation. Even though the statement of naturalness is based on mere familiarity, it may be understood as a claim about genetic and biologically based properties and the nature of women.

ease risks assessment, whereas lack of information complicates it and may, in extreme cases, even prevent it. The more unfamiliar we are with an entity, the more difficult it is to evaluate its possible effects on human beings and the environment (Madsen et al. 2002:271–272). Thus, a high degree of unnaturalness as unfamiliarity implies that an assessment of possible risks cannot be (sufficiently) carried out. Sometimes this kind of extreme unfamiliarity is seen as a reason for moratoria. In such a case the current unfamiliarity of an entity is regarded as a sufficient reason for refraining from using or producing that entity before further knowledge concerning it is acquired – that is until it becomes more familiar and in that sense natural for us.

Thus, claims concerning the unnaturalness of neuro-enhancement can be interpreted as warnings of its possible negative side-effects either on the health and well-being of the enhanced individuals (Lev 2010:107, Lane 2009, and Glannon 2006:50) or on the society<sup>7</sup> (Habermas 2003, President Council on Bioethics 2003, and Glannon 2006:50–51). The weakness of such an unnaturalness argument is, first, that it is unclear why its presenter needs to introduce the idea of unnaturalness at all. Why not refer directly to the possible risks? References to naturalness seem justified in risk discussion only if their presenter accepts an idea of a natural order or human nature which if disturbed, 'strikes back' by some feedback mechanism (Häyry 1994:207–208). When understood in this way, the unnaturalness argument is actually an instance of interpreting naturalness referring to human nature, and then it faces the problems of the interpretation discussed above.

Moreover, an unfamiliarity argument referring to difficulties in risk assessment is categorical. The more knowledge concerning neuro-enhancement methods is attained, the weaker the argument becomes. It might be further questioned whether unnaturalness arguments referring to risks are actually arguments against neuro-enhancement at all. Certainly this type of an argument may be an argument against using drugs and other methods of mental modification. Enhancement, however, means by definition making something better, and, thus, too risky procedures or at least procedures with undesirable consequences are not strictly speaking forms of enhancement at all. Thus, at most the arguments referring to undesirable side-effects are arguments against failed enhancements which should be separated from real enhancements in enhancement discussions.

## 7. Conclusions

The claims that neuro-enhancement is morally suspect because of its unnaturalness are common and often connected to the question of authenticity. Neuro-enhancement is certainly unnatural in the sense of being based on highly advanced

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<sup>7</sup> The social problems resulting from neuro-enhancement are mostly seen to relate to its high price. Because neuro-enhancement is available only for those who can afford it, its use might lead into widening social inequities.

technological and medical applications. However, as the use of highly advanced innovations is not morally problematic as such, and since making things better (i.e. enhancing them) is basically desirable, the unnaturalness argument needs further clarification and support. The above discussion consists of searching for this support by interpreting the unnaturalness as normality, suitability, belonging, and familiarity. None of these interpretations seem to offer sufficient support for the unnaturalness argument.

The strongest support for the unnaturalness argument seems to be gained from interpretations that refer to possible negative side-effects of the neuro-enhancement. These interpretations are, nevertheless, weak because they depend on the actual and possible risks of the methods of neuro-enhancement. An argument referring to the risks of the current methods of neuro-enhancement cannot be a categorical argument against all forms, also future, of neuro-enhancement. It might also be questioned, as noted above, whether a risk argument is an argument against neuro-enhancement at all, but only an argument against failed enhancement procedures.

Interpretations analysed above do not offer support for the view that neuro-enhancement is morally undesirable because of its unnaturalness. Nevertheless, there are also other possible interpretations of unnaturalness and it is possible that some of them (not realised by the author) support the argument. Moreover, the weakness of unnaturalness arguments does not imply that one should accept neuro-enhancement. Other arguments may still show it to be morally undesirable. The weakness of unnaturalness arguments, nevertheless, implies that opponents need to find stronger arguments than references to the unnaturalness of the enhancement methods. Moreover, the weakness of unnaturalness arguments does not imply that they are useless in neuro-enhancement discussions. Naturalness claims can at least sometimes be interpreted as claims about disgust and repugnance, in other words, emotional reactions against violating some hold limit (Räikkä and Rossi 2002:34, Streiffer 2003:38, and Midgley 2000:9). Of course, not all entities that give rise to strong emotional reactions are morally problematic. Nevertheless, serious moral judgements are always accompanied by feelings (Midgley 2000:9) and, thus, claims of unnaturalness can work as so-called moral traffic lights – that is signs for us to stop for further ethical reflection before proceeding with the technological and medical enhancement of the human mind.

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