

Is Freedom Compatible with Moral Neuroenhancement?

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Abstract: *New discoveries in the fields of genetics and neurobiology from the last decades have offered scientists more understanding regarding the way in which our biology can influence our behavior and have made more appealing the idea of moral neuroenhancement (or bioenhancement), but one of the main objections to this way of enhancing moral motivation is a hypothetical threat to freedom. Critics argue that our freedom would be in jeopardy if we allowed interventions at our genetical level to predispose us to a certain kind of behaviour, even if that behaviour would be moral. My paper wishes to explore the relation between freedom and moral neuroenhancement in order to see if there really is an incompatibility between these 2 concepts and if freedom is indeed undermined by moral neuroenhancement. I will argue for the idea that not only does moral neuroenhancement not imperil our freedom, but that freedom itself could be enhanced with the aid of biomedical techniques, so that the enhanced individual could have more options at his disposal and make better use of his freedom. If moral neuroenhancement can lead to a moral life by improving moral character and predisposing the individual towards being more virtuous, while also improving our freedom and autonomy, then we have strong reasons to enhance our moral behaviour with the aid of neurotechnology. In this paper I will try argue for the idea that this is the case and that the bioconservative objection against moral neuroenhancement regarding the fact that it might undermine our freedom is vastly exaggerated and unjustified.*

Keywords: *moral neuroenhancement; freedom; moral bioenhancement; oxytocin; serotonin; tCDS; lithium; Omega-3; freedom to fall; mental freedom; empathy; moral responsibility; moral sensitivity; moral motivation; counter-moral emotions; racial bias; aggression.*

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1. Introduction

In the past few decades there have been significant discoveries made in genetics and neurobiology opening the door for the possibility of moral neuroenhancement. At the same time, this idea has attracted fierce opposition and heavy criticism from many sides regarding the fact that such an enhancement might negatively impact our freedom. Moral neuroenhancement or bioenhancement is a wide term and it is very hard or even impossible to give an exhaustive definition of this term because there is no general consensus regarding the difference between therapy and enhancement as well as regarding the dispositions which would lead to a moral outcome in all contexts. Unfortunately, the objections against enhancement usually refer to a hypothetical impairment of freedom by the use of biomedical means, without referring to specific methods of moral bio-enhancement which may threaten our freedom. In this way, the objections against neuroenhancement are usually vague and abstract and they don't consider the use of biomedical means which are at our disposal today, but rather they tend to refer loosely to some invasive forms of radically changing our behavior or to some form of mind control so that the authors could express their deepest fears about biological manipulations. I will try to show in this paper the fact that the currently available moral neuroenhancement methods don't justify this fear.

I will first start by examining what moral neuroenhancement is and how it might affect our behavior by analyzing several available biomedical methods of enhancement which are non-invasive, safe and available to the general public at the moment. It is very important to refer to the current available methods of moral neuroenhancement because in this way we can reject the main objections against the fact that enhancement undermines freedom by showing that there's no way in which the current methods of bioenhancement could do that, and that the critics of enhancement usually avoid discussing available methods of moral neuroenhancement because they prefer raising abstract objections without referring to a specific method, which in turn creates an unspecific fear and suspicion of bioenhancement in general. Then, I will analyze the relation between moral neuroenhancement and freedom and some of the main objections regarding the threat to freedom that it entails. In doing this, I will argue that moral neuroenhancement is theoretically compatible with both deterministic and indeterministic theories of human action and I will then analyze the main objections brought to moral neuroenhancement: that it restricts our freedom to commit immoral acts (freedom to fall) and that it impairs our freedom of

mind and I will try to show that these objections to moral neuroenhancement don't stand and that they are neither justified, nor strong enough to give us reasons to disregard currently available methods of neuroenhancement or to stop pursuing research in this area. I will argue for the idea that moral neuroenhancement actually has a positive impact on our freedom and that we have a moral obligation to pursue such research.

2. Methods of moral neuroenhancement

One of the latest definitions of moral neuroenhancement given by its main proponents is the following: Any change in a moral agent, A, effected or facilitated in some significant way by the application of a neurotechnology, that results, or is reasonably expected to result, in A's being a morally better agent (Earp et al., 2017, p. 168). They consider this the agential conception of moral enhancement in the sense that it requires an active and conscious participation from the individual during the enhancement process, and that it's not just an augmentation of a specific function of the body, as in the the functional-augmentative approach to enhancement (Earp et al., 2017, p. 168). This definition allows for a broad classification of methods to be considered, at least partially, as representing some form of moral neuroenhancement, but the problem is that most of them depend heavily on the context in which each individual finds himself and it can't be guaranteed that they will always lead to a moral outcome.

It is very difficult, if not impossible, to point out all the methods which would count as genuine moral neuroenhancement and the same applies for trying to show what exactly moral neuroenhancement would consist in. Does taking a pill which helps us sleep better and consequently gives us good reasons to be more inclined to act morally the next day would count as moral neuroenhancement? That seems to be the case with this broad definition, which is probably a good thing since not all the methods can have the same efficiency. Thomas Douglas, one of the legitimate parents of moral bioenhancement claims that there are at least 2 ways in which we could become more moral through moral bioenhancement (Conan, 2020), that is by diminishing the effects of what he calls counter-moral emotions, such as a strong aversion to certain racial groups and the impulse towards violent aggression (Douglas, 2008, p. 231). Douglas (2008) is wise to propose these 2 characteristics as genuine moral bioenhancement, since there is little controversy regarding the fact that racial bias and aggression are undesirable predispositions and are still widespread even in very developed societies, such as the US, where violent behavior is actually even more

widespread than in Europe. Even though not everybody would agree that the reduction of these counter-moral emotions would amount to genuine moral enhancement, they are considered to do so in all plausible moral theories.

One of the most encountered examples in the scientific literature about moral enhancement is the use of oxytocin, also known as the cuddle hormone (Persson & Savulescu, 2012, p. 118) or the moral molecule (Zak, 2012), which has been shown to improve altruism, cooperation, trusting behavior and promote pro-social attitudes in general (Kosfeld et al., 2005; Zak et al., 2004; Zak, 2012). It is true that oxytocin has its critics and detractors, who claim that it can lead to discrimination towards out-groups (De Dreu et al., 2010; De Dreu et al., 2011), but in general its use should improve our behavior and give us reasons to behave more morally.

Another class of pharmaceuticals with proven effects on our motivation are the selective serotonin reuptake inhibitors (SSRIs), which can alleviate anxiety and depressed moods, promote cooperation and a sense of justice and even increase harm aversion (Crockett et al., 2010; Crockett, 2014; Tse & Bond, 2002). Even if many studies seem to be contradictory and we don't exactly know how to interpret certain effects, the main idea is that it might influence behavior in a positive manner under certain circumstances and could help us keep under control bad moods as well as to motivate us better towards overcoming our lack of motivation. One of the main reasons for which people commit immoral acts is because they lack the motivation to act according to their values and moral principles. Weakness of will or lack of motivation is an old problem which has baffled philosophers since Plato and Aristotle. Commonly known as *akrasia* in Ancient Greece, it was considered by Aristotle to be one of the moral states that we need to avoid (Aristotle, VII, 1145b-1152b) and it remains a widespread feature of our moral psychology to this day. It is true that the philosophers from Ancient Greece didn't have the understanding of human biology that we have today, so they weren't able to overcome *akrasia* other than with the aid of their natural motivation, but doesn't the fact that we have the power today to overcome *akrasia* via artificial means should be a sufficient reason to use them? If we accept artificial means as a way to cure diseases it's hard to see why we wouldn't also accept them in order to enhance our moral dispositions.

There are other examples than oxytocin and SSRIs which could reduce our counter-moral emotions. One of them is the use of lithium and Omega3, which has been shown to reduce violent instincts and temperate individuals with impulsive behavior (Gajos & Beaver, 2016; Goldstein &

Mascitelli, 2016; Müller-Oerlinghausen & Lewitzka, 2010). This is good news, because these substances are available to a larger population than it is the case with oxytocin and serotonin. In the case of lithium, its effects on aggression are well-known for over 70 years, but because a high dose can have adverse side-effects, it wasn't promoted on a larger scale. It used to be promoted in the '40s, when the company 7up put lithium in its drinks, but nowadays it doesn't seem to be very promoted, even though in small doses it proved to be quite safe and to have beneficial effects. Omega3 acids are even more widespread and don't have adverse side-effects at all, so their use should be promoted as much as possible without the fear of any risk. Of course, we must understand the fact that these substances don't work like magic and they won't turn all people into moral agents overnight, with a tireless urge to commit moral acts. What they do is simply to reduce the number of violent aggressions and crimes committed out of an impulsive and violent behavior. It is wrong to assume that moral neuroenhancement would completely eradicate immoral acts from society. That's an unrealistic approach which shows a misunderstanding regarding the way in which biomedical methods work. This scenario wouldn't be possible even with the most effective biotechnologies, firstly because we don't have them, secondly because they couldn't be employed globally even if we had them and thirdly because they couldn't causally determine individuals to behave morally in all circumstances. Their role is much more modest because they can only alleviate some moods and negative tendencies, so they can be nothing more than a brake on aggression (Baron-Cohen, 2003, p. 35). Their modest role should be a sufficient argument against the idea that they would endanger our freedom or make us less free.

Another example of moral neuroenhancement which is safe, non-invasive and beneficial is the use of transcranial current direct stimulation (tCDS), which many bioconservatives might find suspicious. This method refers to the use of low-intensity electrical current delivered via electrodes in order to stimulate the activity of specific brain areas and has been proven to reduce both impulsive behavior and racial bias (Choy et al, 2018; Raine, 2014; Sellaro et al., 2015). The method is quite safe and doesn't have adverse side-effects which makes it a good candidate for a successful neurotechnology with desirable effects on our moral psychology. Bioconservatives might be tempted to disapprove of it because it uses external stimuli in order to affect our biology, but there's no qualitative difference regarding the way in which tDCS modifies our brain chemistry in comparison with Omega3 substances, for example. This shows why a drug we would ingest and which could affect our behavior shouldn't be seen as

less invasive than a method using a machine, as it is the case with tDCS, since the effects of both methods are safe and prove to be the same.

3. Moral neuroenhancement and freedom

One of the main concerns of the critics of moral neuroenhancement is a hypothetical threat to freedom. More precisely, critics usually argue that biomedical methods could presumably undermine our notion of freedom, restrict our freedom to commit immoral acts or even turn us in some kind of robots who would act morally in a compulsive manner, without considering the reasons we might have for behaving in that specific manner (Bublitz 2016; Harris, 2011; 2013; 2014; President's Council on Bioethics, 2003). But can the current methods of moral neuroenhancement which are available to us today really jeopardize our freedom? Theoretically, freedom is required for us to be considered moral agents, since moral responsibility presupposes it. So freedom and moral neuroenhancement are interconnected and without freedom we couldn't be talking about genuine moral enhancement, because that would mean that the moral agent would be controlled by some external force against his will or that he would perform a moral act in an automatic manner, as if he would be some kind of machine. That doesn't seem to be the case with the current methods of moral neuroenhancement, fortunately.

3.1. *Determinism and Indeterminism*

There is an old conservative fear of moral neuroenhancement, in the sense that the growing knowledge regarding the functioning of our genes would undermine our notion of freedom because it may prove that we are determined by our genes to behave in the way we do, which would have the unwanted effect of absolving us of our responsibility for committing immoral acts and therefore erode our freedom. This thesis is generally known as the *Incompatibilist Determinism- the thesis that everything that happens has a cause and that universal causation excludes freedom* (Buchanan et al., 2000, p. 91). This thesis has in fact been shown to be false, because the increase in knowledge regarding the interaction of our genes and the behavior they influence can only show that there is a cause for everything, not that universal causality excludes freedom completely: *No increase in knowledge of causation can do more than establish the first part of the Incompatibilist Determinist thesis - that everything has a cause* (Buchanan et al., 2000, p. 91). The knowledge of how our genes determine our behavior could prove to have no negative impact on our freedom, on the contrary, it could help us improve our freedom by improving our motivational state, so that we could overcome some urges

which are biologically based and correct some *defective genes*, so we have strong reasons to promote the research in this area and put aside the bioconservative aversion for this type of research as being misguided. But where does this powerful aversion regarding biomedical methods comes from in the first place? A partial explanation can be what Nick Bostrom and Toby Ord call *the status-quo bias*, which is *an inappropriate (irrational) preference for an option because it preserves the status quo* (Bostrom & Ord, 2006, p. 658). The conservative bioethicists from the President's Council of Bioethics seem to act precisely according to this type of bias when they suggest that they can't really express their objections to the use of biomedical means: *The subject being relatively novel, it is difficult to put this worry into words. We are in an area where initial revulsions are hard to translate into sound moral arguments* (President's Council on Bioethics, 2003, p. 286).

Today we possess the means to improve our motivation and moral character, but there's a widespread concern that neurotechnology might restrict our freedom. The concern itself is not irrational, since we don't know in detail how exactly neurotechnology can lead to a specific behavior and there could be adverse side-effects which may raise valid safety concerns, but usually the fear that it would invade and undermine our freedom is vastly exaggerated and very unspecific. The available methods which currently exist don't give us enough reasons to consider that there's any potential threat to freedom, especially since they are non-invasive, voluntary and safe. The irrational aversion towards these methods could at least partially be explained by the so-called *status quo bias*, the idea that people prefer the current state of affairs to changing to a new one, especially when that concerns changing our behavior through biotechnology.

Moreover, Savulescu and Persson (2012) have already shown that moral bioenhancement is compatible with determinism as well as with the indeterminist conception of freedom. If determinism were to be true, then moral bioenhancement could not make us less free, because *it will simply make it the case that we are more often, perhaps always, causally determined to do what we take to be good. It will do so by amplifying those biological factors that by nature are strong in those of us who are morally better* (Persson & Savulescu, 2012, p. 112). On the other hand, if indeterminism would govern our behavior, then moral bioenhancement couldn't cancel it, but it would instead be limited by it, which means that *irrespective of whether causal determinism or indeterminism reigns in the realm of human action, moral bioenhancement will not curtail human freedom and responsibility. Biomedical manipulation cannot change the basic laws of our behaviour by making us more (or less) causally determined; it simply uses knowledge of those laws to influence our behaviour* (Persson & Savulescu, 2012, p. 112). Moral

neuroenhancement couldn't, therefore, make us less free without being self-contradictory, but that doesn't mean that it couldn't give us more freedom or help us to better enjoy the freedom that we already possess. To see how that could happen, we need to consider some non-invasive methods of moral neuroenhancement.

It seems that we have sufficient reasons to consider that we should enhance with the aid of these methods, even when the chance that things would improve, all things considered, is very small. A slight change for the better should be preferred to no change at all when it comes to improving our moral character. As Levy et al. put it: *Small changes in the degree to which large segments of the population are concerned about the long-term future, are inclined toward out-group aggression, or are altruistic toward spatially and temporally distant strangers might massively aggravate or mitigate these problems* (2014, p. 122). Could any of these methods pose a threat to our freedom in any way? It is hard to see why that should be the case. These methods could influence our behavior in such a way that we might feel more satisfied about ourselves at the end of the process because we've been able to reduce *akrasia*. If we are even slightly more inclined to behave more morally after being the subject of one of these methods, then it doesn't follow that the procedure itself has seized a part of our freedom in exchange for our moral improvement. On the contrary, it means rather that it helped us behave more morally by giving us more control over our emotions and dispositions and by providing us with more options that arise once we get rid of some unconscious urges or addictions. We have no reason to believe that people who behave morally are less free than the people who don't. As Persson and Savulescu claim: *Just as naturally virtuous people do not compulsively do what they regard as right, so morally enhanced people will not compulsively do what they regard as right* (2012, p. 113). Being more moral should mean being freer, given the fact that these 2 concepts are so intertwined and they can't really work separately.

In order to illustrate this better, we should consider the studies which show the fact that women are, generally speaking, more empathetic and less aggressive than men, which makes them more inclined to behave morally (Baron-Cohen, 2003; Brunner et al., 1993; Morell, 1993; Terao, 2008). This is for sure a strong proof for the fact that these dispositions are, at least partially, based in our biology. But this doesn't mean that we consider women to be less free than men for the simple reason that they have a natural propensity towards a moral behavior and it would indeed be very odd to see it in such a way. In the end, this is how biology works whether we like it or not and some people are more motivated than others to do what they consider to be right for them and for those around them.

This is a fact of life and because we are now in possession of biological means which could help decrease or increase our motivation this should be seen as a blessing rather than a curse.

Moral neuroenhancement can give us strong reasons and motivation to behave morally in instances where we already know the difference between right and wrong, but fall short to do so. When we fail to donate to charity or when we ignore a starving non-human animal whom we pass by on the street, we already have the idea of what the moral thing to do would be, but we might lack the determination to pursue our thoughts. This lack of determination is what moral neuroenhancement would help us improve and this would be a moral thing to do not just from an objective point of view, *the point of view of the universe* (Lazari-Radek et al., 2014), but also for us as human beings because it would help us act according to what we already consider to be the right thing. Not only wouldn't this restrict our freedom, but it would actually improve it by not leaving us with a guilty conscience and help us go all the way to the end and act according to what we already take to be the moral course of action. This is a strong reason to consider that moral people are freer than immoral ones because they are more in control of their moods and motivations, which allows them to act in the way which they think is best suited in a given context. The immoral man might act immorally because of *akrasia* and not because he rationally and consciously chooses to act immorally, at least in some cases. From this it would follow that not only women aren't less free than men, but that they can actually be regarded as having more freedom than men given their moral dispositions, so in this way we have reasons to believe that immoral men are less free than moral women. This can be seen also if we take an example regarding people who have a strong addiction. Do we consider that heroin addicts are freer because they are free to act according to their addiction than people who don't have this addiction? It is hard to see how such a view could be plausible. The fact that we would restrict the freedom of heroin addicts to take the drug should be overcome by the greater freedom they would have were they permanently cured from this addiction with the aid of biomedical methods. A lighter example would be the one concerning people who try to quit smoking, but fail to do so because they have a strong nicotine addiction which overpowers their will to let go of this addiction. In all these cases and many others there is a greater freedom that we can reach with the aid of biomedical technologies which would make us less predisposed to act according to unconscious bias and prejudices and offer us more freedom over our own bodies. As Persson and Savulescu argue: *This is a point that should be emphasized: when we influence the motivational states of people,*

this could be liberating rather than constraining. It could be influence of a sort that they have reason to welcome rather than to eschew (Persson & Savulescu, 2012, p. 114).

3.2. The freedom to fall

There are critics, such as John Harris, who claim that moral neuroenhancement wouldn't be able to reduce the counter-moral emotions that Douglas speaks of, because the emotions are too complex and intertwined: *the sorts of traits or dispositions that seem to lead to wickedness or immorality are also the very same ones required not only for virtue but for any sort of moral life at all* (Harris, 2011, p. 104). He is convinced, in fact, that we would never have the sophisticated technologies to accomplish this and in this regard he seems to be disposing a priori of the possibility of moral neuroenhancement: *I for one am sceptical that we would ever have available an intervention capable of targeting aversions to the wicked rather than the good* (Harris, 2011, p. 105). We can agree that the current methods of moral neuroenhancement are today very limited and we don't yet possess the sufficient knowledge for a successful moral neuroenhancement on a large scale, but this is no reason to disregard moral neuroenhancement or to consider that we won't have access to even more performant techniques of biomedical techniques in the foreseeable future.

In his critique against moral bioenhancement, Harris first presents his view on the notion of freedom by referring to John Milton's *Paradis Lost*, when God says about man: . . . *whose fault?/ Whose but his own? Ingrate, he had of me/ All he could have; I made him just and right,/ Sufficient to have stood, though free to fall* (Milton, 1667, Book III, line 96ff). *The freedom to fall* is therefore the freedom to commit immoral acts by exercising his free will and it is, in Harris's view, essential to us as moral agents: *The space between knowing the good and doing the good is a region entirely inhabited by freedom. Knowledge of the good is sufficiency to have stood, but freedom to fall is all. Without the freedom to fall, good cannot be a choice; and freedom disappears and along with it virtue. There is no virtue in doing what you must* (Harris, 2011, p. 104). Harris is afraid that moral neuroenhancement could have adverse side-effects and that it could *make the freedom to do immoral things impossible, rather than simply making the doing of them wrong and giving us moral, legal and prudential reasons to refrain* (Harris, 2011, p. 105). But, as we saw earlier, it can actually be desirable to restrict an irrational urge or addiction in the present in order to benefit from a larger freedom in the future, and people who act morally shouldn't be considered less free than immoral people. Currently available techniques of moral bioenhancement don't restrict our freedom to fall in the way that Harris fears and have a more modest role: they simply make us more inclined to

behave in ways that we already consider to be moral, but for some reason lack the motivation to act upon.

People are less violent and racist today than they used to be in the Middle Age in or in pre-state societies, but that doesn't mean that they are less free. In fact, it is rather the opposite. The majority of people have today far more rights and freedom than those from previous centuries and we have strong reasons to believe that this is so especially because they have radically changed and learned how to better control their emotions and wild impulses and to have more consideration regarding the consequences of their actions. For example, B.W. Tuchman analyzes the behavior of the average medieval man, writing about the *childishness noticeable in medieval behavior, with its marked inability to restrain any kind of impulse* (Tuchman, 1978, p. 52) Would we claim that such people were freer than most of the people today?

The freedom to fall has indeed been more restricted today than in the past, but this isn't a bad thing and it surely doesn't mean that freedom itself has been trampled on, but rather that it has expanded and become available to a larger number of people. Harris is certain that racism and violent behavior can be fixed with the aid of traditional moral enhancement, but history has showed us that moral progress regarding these 2 counter-moral emotions is very slow and, as we have already seen, they don't just stem out from our lack of information, but most likely have a strong biological component and the tCDS experiments show this very well since they don't influence our knowledge about racism, but our biology by reducing the power of unconscious racial bias over us. Critics of moral neuroenhancement often try to create tension and make things more dramatic by opposing traditional moral enhancement to moral neuroenhancement when in fact there's no opposition between them, since both of them are means to the same end. It is worth mentioning that by employing moral neuroenhancement in order to fight these shortcomings we wouldn't dispose at all of traditional methods of moral enhancement, such as education and moral training, but we would boost them and make them more effective. Moral neuroenhancement should be seen as a complementary method to traditional enhancement and not something that would magically improve our behavior and make us always act morally as if we were programming a machine to clean our house. It would just be a useful tool which would simply make it so that we would be more inclined to behave morally in some uncontroversial instances when doing so wouldn't cost us much or it would cost us very little. Restricting the freedom to fall in this way would turn out to be a good thing because it would lead to

more freedom in the long term and would unlock more options for us. tCDS, for instance, helps us fight racial bias not by giving us more information about the fact that racism is bad, which we already know, but by working at our biological level and reducing the effects of unconscious bias and prejudices on our actions. If we were to stick just to cognitive enhancement, our chances of success would diminish a lot since, as Harris himself recognizes: *it is racist behaviour, not racist beliefs that are the problem, or the main problem* (Harris, 2011, p. 105).

3.3. Mental freedom

Another objection to moral neuroenhancement is the fact that it might negatively impact our mental freedom. This objection is raised by Christoph Bublitz who defines mental freedom as being *the freedom of a person to use her mental capacities as she pleases, free from external interferences and internal impediments* (Bublitz, 2016, p. 94). He gives the example of pharmaceuticals given to us unknowingly which could alter our state of mind in such a way so as to make us less (not completely) responsible for our actions: *These newly induced mental states are not of a kind that undermines free will or resolves you from responsibility. Still, you may legitimately complain about some detrimental effect to your mind, and normatively, about the infringement with some protected interest. The interest in question is not free will — but freedom of mind* (Bublitz, 2016, p. 95). It is true that certain drugs might have this kind of effect, for example if we took high doses of lithium (Pachet & Wisniewski, 2003), but if this was the case they would stop being moral neuroenhancement and it would clearly be an abuse and irrational to use drugs in such an irresponsible way. As long as drugs are used according to the prescription and in a medical setting with the assistance of professionals, then we would have no reason to worry about such side-effects. Also, what Bublitz fears when he is talking about mental freedom sounds more like mind control rather than genuine enhancement. For example, if a hypnotizer would use drugs on us in order to manipulate us into doing what he wants, then this would have nothing to do with moral neuroenhancement, even though he might use our moral dispositions in order to control us. Moreover, a reduction of aggressive behavior can lead to more freedom of mind by getting rid of those negative impulses which can cloud our judgement, and this is a fact that Bublitz himself admits when he says that it *supposedly has beneficial effects on mental control* (Bublitz, 2016, p. 96). However, Bublitz seems to exaggerate the way genuine moral neuroenhancement works, because he considers that enhanced persons would be less free than naturally moral women. He claims, for example, that *feminized men and women may have the same mental and moral properties, yet women are*

responsible whereas manipulated men are not (Bublitz, 2016, p. 94). Bublitz's view strikes me as implausible here, since he seems to understand moral neuroenhancement as being mind control and consequently drawing the conclusion that enhanced persons wouldn't be as morally responsible as the non-enhanced. That is not the case, however, since we've seen that moral neuroenhancement is not a form of mind control and the enhanced person is not manipulated by an outside force who is imposing their own moral views on his will. The enhanced person would simply be more motivated to act according to his own moral principles and there is nobody hiding in the shadows trying to manipulate him and control his mind. DeGrazia makes a good point here when he tries to show that the effects of moral bioenhancement on our body are less dramatic than the bioconservatives would want us to believe: *So suppose that I render help to someone in need in a case where it is inconvenient to do so yet wrong not to help; and MB made me more inclined to help in such a case. The 'boost' provided by MB does not rob my behaviour of freedom any more than the caffeine in my tea robs me of any personal credit for writing this paper* (DeGrazia, 2014, p. 366).

There is also another way in which moral neuroenhancement could extend our freedom. It is probable that a morally enhanced person would have an improved moral sensitivity which could help her to see more options to solve a difficult situation which she couldn't solve when she was unenhanced. As Antonio Diéguez and Carissa Véliz put it: *her more developed and sophisticated sensitivity for moral nuances might permit her to realize that the remaining possibilities of action are more diverse and numerous than it could be thought if given less attentive consideration. In a fractal image, it is possible to lose a part of the whole structure while keeping all its complexity in a more detailed view of the remaining parts* (2017, p. 6). This is an interesting point on which it is good to insist because, generally speaking, we have many reasons to consider moral persons as being freer than immoral ones: they have a better understanding of themselves as moral agents and better pro-social attitudes which helps them enjoy more the freedom that they already possess. Moral sensitivity is an important part of our human psychology upon which we should reflect more and seek to improve, because it might turn out to be the most important element in our effort to construct a more moral society.

4. Conclusion

I have tried to show in this paper that the main objections to moral neuroenhancement regarding its hypothetical threat to freedom are exaggerated and misguided because they usually use abstract and vague

terms to express their fear of altering our biology without referring to specific forms of moral neuroenhancement which are today at our disposal. I have tried to show the fact that the methods of bioenhancement which are currently available to us, such as pharmaceutical drugs or transcranial direct current stimulation are safe and non-invasive methods which don't threaten our freedom and that, on the contrary, they can extend our freedom by improving our moral character and moral sensitivity. Critics of moral neuroenhancement seem to understand it as some form of mind control when claiming that it can undermine our freedom, but the fact is that mind control is not a form of moral neuroenhancement and we need to emphasize this distinction. I have argued that moral neuroenhancement is different from mind control and that an enhanced person is not someone who doesn't respond to reasons or is manipulated by an outside force like a robot, so in the end enhancement via biomedical means can actually improve our mental freedom rather than impair it. All things considered, we can better see at the end of this analysis that not only is freedom compatible with the process of moral neuroenhancement, but that these 2 concepts are closely related and moral neuroenhancement presupposes freedom in order to function correctly, while mind control would be indeed an impairment of our freedom. Furthermore, genuine moral neuroenhancement can actually augment our freedom by giving us more control over our genetic urges and unconscious biases, by improving our moral sensitivity as well as by providing us with more motivation in order to behave morally, which can give us a sense of achievement and joy as opposed to a guilty conscience that we have when we know we didn't act in a moral manner in a specific situation. The fact that we would get rid of this guilty conscience would help us feel and be freer because in this way we have been able to act according to our own moral principles.

Currently available moral neuroenhancement techniques are indeed very modest and it may well prove in the end that we won't be able to find, as John Harris thinks, performant methods in order to control those dispositions which lead to immoral behavior, but we at least have the duty to try our best and pursue research into this topic with an open and unbiased mind for even the smallest changes in our moral behavior can prove to have a huge impact in the global village in which we live today. I have also argued for the idea that our counter-moral emotions have a strong biological basis and that it is unlikely that we might reduce them by appealing solely to traditional means of moral education and to this effect we have a moral obligation to pursue and employ biomedical methods which don't threaten our freedom. We should not allow biases and prejudices to keep us from

pursuing the most effective methods of biomedical enhancement, because it may prove to pay off in the end and improve not only our understanding of ourselves as moral agents who act for reasons, but also our sense of autonomy and freedom. In this regard, I believe that we have a moral obligation to enhance if safe, effective and non-invasive means of moral neuroenhancement are at our disposal. If we play well the game of enhancement and don't succumb to conservative biases against it, we may discover that neurotechnology can actually have desirable effects on our freedom that we ought to pursue.

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