

The Gene-editing of Super-ego

Bjørn Hofmann, NTNU Gjøvik and University of Oslo, Norway

Abstract:

New emerging biotechnologies, such as gene editing, vastly extend our ability to alter the human being. This comes together with strong aspirations to improve humans not only physically, but also mentally, morally, and socially. These conjoined ambitions aggregate to what can be labelled “the gene editing of super-ego.” This article investigates a general way to argue for new biotechnologies, such as gene-editing: *if it is safe and efficacious to implement technology X for the purpose of a common good Y, why should we not do so?* This is a rhetorical question with a conditional, and may be dismissed. Moreover, investigating the question transformed into a formal *Is X for the purpose of a common good Y, why should we not do so?* (Pinker 200d either. Nonetheless, the compelling force of the question calls for closer scrutiny, revealing that this way of arguing for biotechnology is based on five assumptions. Analysis of these assumptions shows their significant axiological, empirical, and philosophical challenges. This makes it reasonable to claim that these kinds of question based promotions of specific biotechnologies fail. Hence, the aspirations to make a *super-man* with a *super-ego* appear fundamentally flawed. As these types of moral bioenhancement arguments become more prevalent, a revealing *hype test* is suggested: *What is special with this technology (e.g., gene editing), compared to existing methods, that makes it successful in improving human social characteristics in order to make the world a better place for all?* Valid answers to this question will provide good reasons to implement such technologies. Hence, the aim is not to bar the development of modern biotechnology, but rather to ensure good developments and applications of highly potent technologies. So far, we still have a long way to go to make persons with *goodness gene(s)*.

“It is possible to get the life-phenomenon under our control ... such a control and nothing else is the aim of biology.” Jacques Loeb (1859–1924)

Quoted from (Pauly 1987).

Background

In these exciting times several influential trends come together. First, rapidly advancing genetic sequencing technologies, Big Data, and artificial intelligence boost the knowledge of humans’ genetic traits. A wide range of human characteristics are related to genes, including social traits, such as intelligence (Le Page 2017; Sniekers et al. 2017), risk of divorce (Salvatore et al. 2017), cooperation (Kasper et al. 2017), and altruism (Thompson et al. 2013; Salvatore et al. 2017).

Second, new biotechnology, such as gene editing and gene drives¹ are vastly extending our ability to alter the human being, and envisions to alter our social traits as well (de Araujo 2017; Wang 2017; Le Page 2017). In particular, gene editing appears to be the most powerful of new biotechnologies providing new perspectives on human evolution. The hopes for the applications of this emerging technology for improving human conditions and the human being as such are high. Not only will we be able to eradicate diseases (Wang 2017), we will also be able to improve the human being.

Third, this extension of knowledge and actionability is combined with strong aspirations to improve the human being not only physically, but also mentally, socially, and morally (Persson and Savulescu 2012, 2008; Wang 2017). Not only do some want to create a super-human. Some also want to improve its “super-ego.” This is fuelled by a fear that the tremendous pace of technological possibilities is likely to promote humanity’s destruction (Persson and Savulescu 2012)(pp.46–59). Biotechnology may be the most efficient way to handle our common global

¹ Which add to other technologies such as drugs, brain stimulation, pluripotent stem cell induction, and others.

challenges (Liao et al. 2012). Accordingly, it has been argued that moral enhancement could be made “obligatory” in the same way as “education or fluoride in the water.” As Persson and Savulescu express it, “safe, effective moral enhancement would be compulsory” (Persson and Savulescu 2008)(p.174). Traditional ways of promoting morality appear to be ineffective: “the degree of moral improvement since the time of Confucius, Buddha and Socrates has been... small in comparison to the degree of technological progress, despite moral education,” (Persson and Savulescu 2013a)(p.130). Now we are provided with new technologies that completely alters the game.

The aim of this study is to investigate the claim that we should use novel biotechnologies, such as gene editing, in order to enhance general social abilities, such as altruism, in order to make the world a better place. The analysis will investigate a specific expression of the claim and five of its assumptions. It will be argued that this way to argue for “the gene-editing of super-ego” is not viable.

The argument

The ways to argue for using biotechnology to change human relational characteristics take on many forms, but one common and forceful form is a question based conditional:

A: If it is safe and efficacious to implement technology X for the purpose of a common good Y, why should we not do so?

Variants of the this way to promote technology can be found on various levels of the debate, e.g., as early as in 1998 James Watson argued that "if we could make better human beings by knowing how to add genes, why shouldn't we do it? What's wrong with it? Who is telling us not to do it?"

(Hauskeller 2014). Kahane and Savulescu have used a similar formula: “For pretty much every objection to biomedical enhancement, it is possible to reply: ‘If what worries you about

enhancement is X, then why shouldn't we try to enhance X?' For example, if your worry about human enhancement is that it would threaten our openness to the unbidden, or our solidarity with others, or our autonomy, then how can you object to biomedical interventions aimed to *increase* people's openness to the unbidden, or their autonomous capacities?"(Kahane and Savulescu 2015).

Throughout the debates on human enhancement the technologies (X in A above) have varied from drugs and transcranial direct current stimulation (tDCS) to gene editing and gene drives.

Correspondingly, the social characteristics (Y in A) have included altruism, intelligence, solidarity, empathy, and collaborative abilities, and super-ego may be used metaphorically as a common term for these. In order to make the argument less abstract I take gene editing to be an example of X and altruism to be an example of Y in this article. Hence, the argument is:

B: If it is safe and efficacious to implement gene editing for the purpose of enhancing altruism, why should we not do so?

It may be remarked that this is not an argument in the strict sense, but a rhetorical question including a conditional. A question is not a proposition, and has no truth value. Moreover, it presupposes that the only thing that counts for the assessment of a technology is its safety and efficacy. If these conditions are met, no other things matter. No other perspective (than consequentialism) is relevant, and there are no other counterarguments. It also bypasses the crucial questions of whether gene editing will ever be safe and efficacious and how we are going to find out.

Such problems with the claim also come out clearly, if we formulate the claim as an argument (modus ponens):

- P1 If it is safe and efficacious to implement gene editing for the purpose of enhancing altruism, then there are no (ethical) reasons not to implement gene editing for this purpose.
- P2 It is safe and efficacious to implement gene editing for the purpose of enhancing altruism.
- C Therefore, there are no (ethical) reasons not to implement gene editing for the purpose of enhancing altruism.

If there are other (ethical) reasons not to implement gene editing for enhancing altruism, then P1 is false. P2 is surely not true at the present, as we have no empirical evidence. Hence, the premises are at best indecisive. In that case, the argument does not convey truth to the conclusion. (Certainly, the conclusion may be true, but that is not due to the affirmation of the modus ponens).

However, the claim may not be meant to be formed like such a (formal) argument, and in the name of the principle of charity, we should assess the claim A on its own merits. Doing so, there still seems to be a set of (more or less hidden) assumptions for the claim:

- A1 We know what is morally good and what we want to obtain. (Social characteristics, such as altruism and collaborative abilities).
- A2 We know what is associated with the moral good. (Example: Drugs, nerve stimulation, genes, constellation of genes).
- A3 We know that if we modify this factor (or these factors), then people will become more morally good (on for the greater number).
- A4 The context (of the intervention) is stable enough to ensure that what was considered to be morally good at the time of making A1, is still morally good at the time when the technology is fully implemented.
- A5 What matters is the greater (moral) good for the greater number (maximization).

These assumptions do not form premises for a conclusion, but are assumptions that must obtain in order for the effectiveness claim to have any traction.

Let us now examine these assumptions.

A1: We know what is morally good and what we want to obtain

The claims (A and B) presuppose that we know what is good and what we want to obtain. This can be classified as an axiological assumption. Although the moral bioenhancement debate is full of examples, such as empathy, altruism, solidarity, and collaborative characteristics, it is not clear what moral enhancement is. Does it involve better moral motives or does it depend on other moral characteristics, traits, or capacities or the outcomes of such traits? Moreover, does the moral good (e.g., altruism) have to be increased or for specific (leading) persons in a group? The argument appears to depend on a philosophical issue that has not been settled yet, and which appears to haunt the enhancement debate: what do we mean by “good”? (Hofmann 2017)

No doubt, progress has been made and moral goodness has been considered to be something universal defined as “what gives each of us the sense that we are worthy human beings” and it is argued that we have “five moral spheres,” i.e., harm, fairness, community (or group loyalty), authority and purity that “are universal, a legacy of evolution.” (Pinker 2008) Despite these efforts, there still exists considerable disagreement on what is morally good for human beings.

One suggested solution is to make people better philosophers, i.e., “helping people determine for themselves what being moral consists in, as well as help ensure that they act on those judgments.” (Owen 2014). However, this certainly generates problems with respect to the overall goal of making the world better, as people may (as do philosophers) disagree on what it is to “be moral.” Hence, it is far from obvious what is (morally) good (Y). Hence, the first assumption does not obtain.

A2: We know what is associated with the moral good

The second assumption is *empirical* and assumes that we know exactly what is associated with the moral good, so that it can be manipulated by a given biotechnology (X, e.g, gene editing) and that we thereby can achieve the moral good. No doubt, we can find a range of examples of such aspirations. One example is Steven Pinker who stated that: “Though no one has identified genes for morality, there is circumstantial evidence they exist. The character traits called “conscientiousness” and “agreeableness” are far more correlated in identical twins separated at birth (who share their genes but not their environment) than in adoptive siblings raised together (who share their environment but not their genes).” (Pinker 2008)(p.32,36). This fits well with the grand vision of genetics, neatly spelled out by the Nobel laureate Walter Gilbert: “Three billion bases of sequences can be put on a single compact disk (CD), and one will be able to pull a CD out of one’s pocket and say, ‘Here is a human being; it’s me!’” (Gilbert 1992)(p.96). Today, one can argue, we know much more about the relationship between various neurological, biological, biochemical, and biomolecular factors and the moral good.

Despite great progress, we still are far from any comprehensive knowledge of factors influencing moral goodness. Moreover, context plays a major role: “The lessons from genome biology are quite clear. Genes and their products almost never act alone, but in networks with other genes and proteins and in context of the environment”(Chakravarti 2011) (p.15). This is also illustrated by Zadeh's uncertainty principle stating that our ability to make precise and yet significant statements about a system’s behavior decreases with its complexity, until a threshold is reached beyond which precision and significance (or relevance) become extremely difficult.

So far, we do not have detailed knowledge of the various factors that influence moral goodness in general and altruism in particular. The complexity of these (internal) factors, and the interaction

with (external) context may explain why this is so. Hence, the presumed biological correlates to moral goodness are yet not known. But even if these were known, we have to face the challenges with the third assumption.

A3: We know that if we modify these factors, then people will become more morally good.

The third assumption is also an empirical assumption about control. No doubt the manipulating capacities are considered to be substantial: «Genome-editing technologies are now transforming our ability to perturb regulatory elements across entire genomes» (Elkon and Agami 2017)

However, it is one thing to know associations between genetic (or other biological) phenomena and social characteristics, but quite another thing to manipulate the same social characteristics by altering these genetic phenomena. Association is not causation. Experiments that verify the expected outcome (and a fair level of safety) are not easy to design or perform, will take long time, are costly, and may have a wide range of unexpected consequences (Schaefer et al. 2017). Even though moral categories and spheres may be universal and biologically contingent, “how they are ranked in importance, ... depends on the culture.” (Pinker 2008).

The point here is that even if we hold the other assumptions to be true, we face with problems showing that the expected social characteristics will be altered by the biotechnology in focus. So far, we neither seem to have any detailed knowledge of how to alter social characteristics in general or altruism in special. But even if we would (by some technological marvel) be able to show that the expected social outcomes resulting from the technology, we still have challenges to overcome.

A4: The context is stable enough to ensure that what was considered to be morally good at the time of making A1 is still morally good

The fourth assumption is one about stability of values. Even if we obtain the intended social outcomes, it is far from clear that this will result in the moral goal at the time when the results are ready. “The times they are a’changin.” (Bob Dylan 1964). What may be an excellent moral preparedness today may be of little relevance in the future, given a different context. The challenge of social emergence is acknowledged (Sandberg and Fabiano 2017) and should be taken into account. It is not unreasonable to think that future beings, be they intelligent androids, synthezoids, or alternate-substrate sentiences, will have other conceptions of moral goodness (Lawrence 2017). The point is that our assessments of moral goodness are based on challenges that we acknowledge today. These may be different or even obsolete in the future.

A5: What matters is the greater (moral) good for the greater number

The fifth assumption is a philosophical assumption about overall maximization (consequentialism), and may not be held by all that argue for enhancing technologies in this manner (A or B). What matters is not the individual increase but the greater of whatever we consider to be the social characteristics we want to improve for the greater number. However, maximizing the level of altruism, empathy, or intelligence (Moen 2016) does not ensure the world to become a better place. History has taught us about the harmful influence of single persons. While it may be less likely that morally enhanced persons will accept dictators, and the influence and effect of dictatorship may be reduced, there are of course no guarantee that even morally bioenhanced persons will not be led astray. Hence, the improvement of altruism (or whatever standard for social improvement we choose) is no guarantee that the world will become a better place.

Discussion

I have investigated the argument “If it is safe and efficacious to implement technology X for the purpose of a common good Y, why should we not do so?” Five assumptions have been identified: one axiological, two empirical, one prophetic (about future values), and one philosophical.

Closer scrutiny has revealed profound challenges with all of them. This makes it reasonable to claim that this way to argue for biotechnologies does not hold, at least not for X being gene editing, and Y being a social good, such as altruism, i.e., “the gene-editing of super-ego.”

One can, of course, argue that there are other assumptions for moral enhancement to make the world a better place than those analyzed in this article. For example, three such assumptions are:

A6: People would use the technology voluntarily, or it would be warranted to make it compulsory (Persson and Savulescu 2013b).

A7: People would not significantly reduce their autonomy by the technology (Harris 2011; Bublitz 2016).

A8: The technology will not be misused.

There are challenges with these premises as well. For instance, “any technology for biomedical shaping of behaviour and dispositions is much more likely to be used for ill rather than good” (Sparrow 2014). However, these and other assumptions do not restore the strength of this way to argue for emerging biotechnology. Further investigations may dig out and discuss these and other premises. The five assumptions investigated in this article should suffice for making the point.

Another important issue following from this study is that hypothetical questions in conditional arguments warrant caution. As we remember, the general argument is on the form: “*If it is safe and efficacious to implement technology X (e.g., gene editing) for the purpose of a common good Y (considered to be good, e.g., improving altruism), why should we not do so?*” The argument has a

rhetorical bias, as it is difficult to be against something good. This can be illustrated by substituting for Y: If it is safe and efficacious to apply technology X (such as gene editing) to make (mainstream) Americans bioethicists understand the concept of dignity, why should we not do so? Moreover, the argument addresses only one question: Is the technology good or bad?² This tends to bypass or ignore important questions, such as: how can the technology be developed and implemented in a good way? How can we avoid downsides? Can safety and efficacy ever be properly assessed? Is it right to solve the problems of the future at the cost of ignoring the problems of today (i.e., opportunity cost)?

Admittedly, the arguments concerning novel biotechnologies (and their enhancements of social characteristics) are not always made to guide actions but more for principled philosophical inquiry. Such arguments are frequently based on assumptions about safety and efficacy (Jotterand 2017) and not about evidence. In a philosophical setting, such reasoning may be warranted and highly fruitful. However, they are used in public debates on new biotechnology where they may become influential on policy without proper assessment. Therefore, there are reasons to take these claims or arguments seriously, even if they appear far-fetched.

No doubt, hypothetical questions, thought-experiments, and principled arguments are wonderful tools to tease out and discuss principal issues. Correspondingly, abstract discussions on moral (and other types of social) enhancements are very important. However, when they are mixed with rhetorical twists and covert (and dubious) assumptions to promote certain technologies, one should become alerted.

In order to avoid the pitfalls of such arguments I suggest what might be called a *hype test*: The general version of the *hype test* goes as follows: *If there are relevant and available means to a*

² And with only one perspective on good and bad.

specific social goal, which we have not obtained otherwise, what reasons do we have to think that we will obtain it with this advanced new technology? The test is aimed to tease out the reasons that the given technology X is better at achieving the acclaimed social goals than other traditional means (such as education and legal punishment etc). What makes these means more effective and safer than other approaches? Is the promotion based on naïve technology optimism or belief in “technological imperative” (Hofmann 2002; Wolf and Berle 1981)? If we cannot point out what makes the technology X so special, the claim fails the hype-test.

The hype-test can be formulated in different ways, depending on the perspective. One such version of the test goes as follows: *If we are not altruistic enough today in order to obtain just distribution of already available goods (food, safety, effective medicines), what reasons do we have to think that such a goal will be obtained with resource demanding advanced technology (such as gene editing) not yet available?* This version targets the belief that we are not able to control the development of technologies, and that they endanger human existence (Savulescu and Persson 2012; Persson and Savulescu 2010, 2012), but that with these new technologies (X) we will be able to control them to the benefit to all.

Another specific version that targets the relevant differences to other means for social improvement, goes like this: *What is special with this technology (e.g., gene editing) that makes it succeed in enhancing human social characteristics in order to make the world a better place for all, compared to existing methods (that have been less successful)?*

Using the *hype test(s)* may avoid unsound arguments and quick conclusions in assessing and deliberating on new and groundbreaking technologies.

In this paper "social characteristics" of human beings have been used to mean psychological and social traits that affect our attitudes, behavior towards, and relations to other humans, such as

altruism, empathy, solidarity, and collaborative abilities. The term “super-ego” has been used metaphorically as a common term for such characteristics. Admittedly, this may be viewed as a misnomer and a rhetorical trick. However, this has been done for two reasons. First: to highlight the high ambitions with bioenhancing technologies. Second, the concept of super-ego draws attention to the relationship between biology and social characteristics, between the natural sciences and the humanities, and thereby the relationship between “the two cultures” (Snow 1959).

Traditionally, the perspective of super-ego and modern biotechnology are incommensurable. Even stronger: relating super-ego to biological phenomena has been considered to be a category mistake.

The three agents of the Freudian psychic apparatus are not related to structures of the brain.

According to the Freudian structural model, the *super-ego* is the agent that plays the critical and moralizing role, while *id* contains the basic instinctive drives of the human psyche. The *ego* is the organized, realistic part that mediates between the desires of the *id* and the *super-ego*. Hence, in this perspective super-ego is a purely social construct with little or no biological or neurological correlations.³

However, while the two-culture-objection to gene-editing super-ego may have been a valid objection, this is hardly compelling any more. Ever more mental and moral faculties are given clear biological or neurological identities. For example, it is argued that our primitive “drives are controlled or regulated by higher brain regions of the basal ganglia, amygdala, and cerebral cortex” and that neocortex “provides the anatomical substrate to locate Freud’s superego and gives C.S. Lewis a place for the free will!” (Martin 2017)(p.74-75). The idea that genes underlie altruism and other social characteristics has reached wide recognition (Thompson et al. 2013; Warrier et al.

³ On a historical note, it has been argued that Freud in his neurological and psychological period while working on the “Project for a scientific psychology” (Freud 1966 [1895]; Oring and Rangell 2007) wrote a thesis on neuroscience. However, Freud is supposed to have burned this manuscript in 1885 together with other works that he felt were not up to standards.

2017; Sniekers et al. 2017). Hence, there are strong ambitions to characterize and modify social characteristics by modern biotechnology, such as gene-editing.

So while no explicit claim that “we should gene-edit super-ego” has been identified, there are clear and outspoken aspirations that social and moral characteristics are identifiable with and should be modified by modern biotechnology. For example, it is argued that we can enhance human dignity, seen as “a quality, a kind of excellence admitting of degrees and applicable to entities both within and without the human realm” (Bostrom 2009) Others have argued that “[r]elating to the plight of people on the other side of the world or of future generations is not in our nature” and using new biotechnologies “could make possible feelings of global affiliation and of abstract empathy for future generations.” (Kahane 2011). Some also claim that “We have reason to believe that promoting cognitive capacities and rationality by means of emerging technologies is sufficient to increase the likelihood of human beings acting morally on the social level.” (Sorgner 2016).

More specifically, it is argued that gene editing may be used to alter social traits: “CRISPR may be used to raise the lower levels of intelligence in societies.” (Le Page 2017)(p.9). “In creating these ‘designer babies’ we would have the power to augment the child’s physical abilities, improve its intelligence, and select for specific phenotypes that are deemed desirable. ... we now have the power to advance the process of evolution artificially with genetic *enhancements*. Traits like athleticism, physical features, intelligence, artistic ability, etc. could be altered and augmented in an embryo’s genome.”(Wang 2017). Of course, the aspiration biologically or genetically to alter human behavior is not new. Criminal behavior has been related to the Y-chromosome decades ago (Editor 1967), without having wide implications. However, gene editing is one of the most powerful new technologies for human enhancement. It has the potential to change the human being in many ways. In particular, it is argued that it is a good thing to promoting genes that “would

embody the virtue of justice, would regard freedom, equality and solidarity as norms, would act upon them, would watch out when they are being attacked (and respond in an appropriate manner), and would try to convince others to act accordingly.” (Sorgner 2016).

Hence, in Freudian terminology, the aspirations of human enhancement in general, and with gene editing in particular, are analogous to an intervention on – and improvement of – Super-ego. I have therefore only used this as a generic term for all the social characteristics that modern biotechnology is aspiring to alter in order to create a better world. The purpose has not been to revive the (controversial) concept of super-ego either, but rather to draw attention to some of the underlying philosophical challenges with aspiring to use emergent biotechnologies for social engineering. The gene-editing of super-ego therefore is a metaphor for a set of aspirations that deserve careful attention. Moreover, there are too many outspoken aspirations for biotechnological enhancement of a variety of social characteristics for this being a strawman.

One last comment of precision: I have not claimed that it is impossible to argue for “the gene-editing of super-ego.” I have only argued that one particular, and admittedly forceful, way to promote human enhancement of social characteristics is not valid. Others may of course be. However, one may expect that some of the same challenges that have come up in this analysis may be relevant to other arguments as well, as they must provide similar axiological, empirical, and philosophical reasons for genetically concocted social enhancement.

Conclusion

In this article I have investigated a general way to argue for new biotechnologies, such as gene-editing: *if it is safe and efficacious to implement technology X for the purpose of a common good Y, why should we not do so?* Although this is a rhetoric question with a conditional that does not hold if one transforms it into a formal argument, its compelling force makes it deserving closer

scrutiny. As I have shown, the claim is based on (at least) five assumptions. Analysis of these assumptions revealed significant challenges with all of them. This makes it reasonable to claim that neither the formal argument nor the rhetorical question arguing for the gene editing of social characteristics to make the world a better place hold. Hence, the aspirations of making a *super-man* with a *super-ego* appears fundamentally flawed. As these types of social bioenhancement arguments become more prevalent, a revealing *hype test* is suggested: *What is special with this technology (e.g., gene editing), compared to existing methods, that makes it succeed in improving human social characteristics to make the world a better place for all?* Valid answers to this question will provide good reasons to implement such technologies. Hence, the aim is not to bar the development of modern biotechnology, but rather to ensure good developments and applications of highly potent technologies. So far, we still have a long way to go to generate the *goodness gene(s)*.

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