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# GENETIC ENHANCEMENT AND THE CHILD'S RIGHT TO AN OPEN FUTURE<sup>1</sup>

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## abstract

*In this paper, I analyze the ethical implications of genetic enhancement within the specific framework of the “child’s right to an open future” argument (CROF). Whilst there is a broad ethical consensus that genetic modifications for eradicating diseases or disabilities are in line with – or do not violate – CROF, there is huge disagreement about how to ethically understand genetic enhancement. Here, I analyze this disagreement and I provide a revised formulation of the argument in the specific field of genetic enhancement. First, I argue that CROF is not in contrast with every kind of enhancement. I subsequently discuss whether CROF requires some moral obligations to enhance progeny. My argument is that parents do not have the moral obligation to open as many options as possible for their children. Rather, they should provide them with a reasonable range of opportunities. Finally, I contend that the moral obligations required by CROF are directly dependent on what Allen Buchanan calls the ‘dominant cooperative framework’ in a given society. I conclude by claiming that, at present, parents are not morally obliged to genetically enhance their children since a non-enhanced person already might have access to a reasonable range of opportunities. However, the moral obligation to enhance progeny might arise if a structural modification of the dominant cooperative framework occurs.*

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## keywords

*child’s right to an open future, genetic enhancement, reproductive choices, dominant cooperative framework, assisted reproductive technologies*

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**1. Introduction** According to the Child's Right to an Open Future (CROF), parents should guarantee, or at least not deliberately constrain, the future autonomy and self-realization of their children. This argument was initially proposed by Joel Feinberg (1980) in order to guide parental choices related to child-rearing. Subsequently, it has become commonplace in the debate on the procreative choices in the field of new reproductive genetic technologies. Because of the availability of techniques such as *in vitro* fertilization, preimplantation genetic diagnosis (PGD), mitochondrial replacement therapy, and genetic testing, parents-to-be have unprecedented control over the genetic characteristics of their future progeny. Furthermore, through germline genome editing, in the next future, we will be able to directly choose some genetic traits of the future individual by modifying *in vitro* human embryos' DNA before implantation (Tang *et al.*, 2017). Due to germline genome editing, we will treat effectively some genetic diseases such as Duchenne muscular dystrophy, cystic fibrosis and even Huntington's disease. But the most challenging possible outcome of the application of this technique may be the possibility to genetically enhance the progeny. By genetic enhancement I mean the use of reproductive technologies in the following ways: a) to improve the capacities or to change traits – such as intelligence, height, memory, etc. – in early embryos that would already have developed in healthy, normal people, namely people who have the normal functioning capabilities of human species (Douglas, 2014); b) to choose some aesthetic traits of the progeny, such as hair or eye color<sup>1</sup>. In light of these current and future possibilities and the growing control that parents have on the genetic make-up of their progeny, according to CROF advocates, we are facing not only an extension of the range of procreative choices, but also some emerging moral obligations towards future progeny. CROF suggests rethinking procreative choices not as a clash between two different kinds of principles, namely the parental right to procreate autonomously (principle of autonomy) and concerns for the future child's quality of life (principle of beneficence); on the contrary, reproductive decisions should be considered as a clash between the autonomy of parents and

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1 In the next future, it might be possible that genome editing technologies will enable scientists to make changes to embryo's DNA leading to specific changes in physical traits of a future child - such as hair and eye color - according to the parents' preferences. However, it must be said that some fertility clinics have already begun offering PGD to select the eye color of the future child (Ranisch, 2019).

the autonomy of the child. Whereas in a conflict between two different bioethical principles the point is to argue which one will trump the other, conceiving the clash as one between two instances of the same principle helps us to recast the discussion. In this way, according to CROF advocates, it is easier to understand that some procreative decisions should be considered morally objectionable because they compromise the future autonomy and self-realization of the progeny.

In this paper, I investigate the ethical implications of genetic enhancement through the lens of the “child’s right to an open future” argument. Here, I do not want either to criticize CROF or to support it: assuming its validity, I want to assess the required moral obligations towards progeny in this specific framework. Whilst there is a broad ethical consensus that genetic modifications for eradicating diseases or disabilities are in line with, or do not violate CROF, the same does not hold for genetic enhancements. Indeed, some scholars reject the claim that CROF allows genetic enhancement (Mintz *et al.*, 2019), others maintain that such an argument should allow only some specific kinds of enhancement (Buchanan *et al.*, 2009; Agar, 2004) and others even believe that it grounds a moral obligation to genetically enhance the future progeny (Resnik, 2000; Savulescu, 2007; Schmidt, 2007). Disagreement on the conclusions reached starting from the same argument seems to make CROF an empty concept, useless to inform procreative choices in the field of genetic enhancement. Hence, it is necessary to analyze the aforementioned disagreement to propose a revised version of the argument. In order to do this, I analyze this disagreement and provide a revised formulation of the argument in the specific field of genetic enhancement. After presenting the formulations of CROF provided by Feinberg and Davis (Section 2 and 3), I argue that CROF is not in contrast with *all* kinds of enhancement (Section 4). I then discuss whether CROF requires some moral obligations to enhance progeny (Section 5). My argument will be that parents do not have a moral obligation to open as many options as possible for their children. Rather, they should provide them with a reasonable range of opportunities. Finally, I contend that the moral obligations required by CROF are directly dependent on what Buchanan calls the ‘dominant cooperative framework’. I conclude by claiming that, at present, parents are not obliged to genetically enhance their children since a non-enhanced person already has access to a reasonable range of opportunities (Section 6). However, the moral obligation to enhance the progeny might arise if a structural modification of the dominant cooperative framework occurs (Section 7).

In his paper *The Child’s Right to an Open Future*, Feinberg argues that parents should protect the future autonomy and self-realization of their children (Feinberg, 1980). According to Feinberg, there are two types of rights belonging only to children called ‘C-Rights’: firstly, ‘dependency rights’, that are those derived from the child’s dependence on others for the basic goods of life such as food, shelter and protection; secondly, ‘rights-in-trust’, namely rights that have to be preserved for the child until is an adult. In this respect, the child is not yet able to exercise such rights-in-trust, however, they should be protected so that the future person that the child will eventually become has the possibility to exercise them. Parents’ actions that violate these rights should be considered morally objectionable. Whilst rights-in-trust are a heterogeneous cluster of rights, they broadly fall within the category of the ‘right to an open future’, that is, an ‘anticipatory autonomy right’. Rights within this cluster include virtually all the significant rights we believe adults have, but which have to be safeguarded now to be exercised in the future.

One example of a right that falls within the right to an open future is the procreative right (Cutas & Hens, 2015): since a child is not physically able to procreate, she cannot currently exercise this right. However, when she becomes able to conceive children, she will be able to

## **2. The child’s right to an open future**

exercise such a right (Davis, 2010). Therefore, in order to have the possibility to exercise her procreative rights, the child has the right not to be sterilized by her parents.

Summarizing, Feinberg maintains that parents should guarantee that “basic options are kept open and growth kept natural or unforced” (Feinberg, 1980 p. 127). Furthermore, serious and final commitments should be postponed until the child is able to make her own decisions about her life plan.

**3. Procreative choices and the right to an open future**

The first formulation of CROF aiming to guide parents' procreative decisions is proposed by Dena Davis (1997). She claims that not only parental choices made after the birth of the baby can violate the child's right to an open future, but also decisions made before birth. Specifically, procreative choices in the context of PGD, namely selecting embryos according to the genetic traits, might confine the future child forever to a narrow group of people and a limited set of careers. Davis analyzes the case of deaf parents who want to give birth to a deaf child: parents who employ PGD to select for deafness violate CROF, since “they are deliberately constraining the ability of their children to make a wide variety of choices when they become adults” (Davis, 2010, p. 84). According to Davis, this conclusion is consistent with both interpretations of deafness, namely deafness as a disability (Harris, 2000) and as a cultural trait (Sparrow, 2005). Indeed, regardless of the interpretation that we support, parents are limiting cultural, social and career choices, since such a choice forecloses significant pieces of the child's adult life and cannot normally be reversed during the child's life (Davis, 2010). In this way, the future child would not be able to lead a lifestyle grounded in values that differ substantially from those of her parents.

The aforementioned formulation provided by Davis, suggests some moral limitations on the principle of procreative autonomy primarily in order to deliberately avoid constraining, through genetic selection, the ability of the future child to make a wide variety of choices when she becomes an adult. However, this formulation is less clear about how to deal with choices in light of the availability of genetic enhancement through germline genome editing. In the next section, I discuss whether CROF precludes or not the possibility of employing any kind of genetic improvement for offspring.

**4. The ethics of enhancement: closing the door to an open future?**

Some CROF advocates claim that all kinds of genetic enhancement should be considered inconsistent with CROF. According to Mintz and colleagues, germline genome editing for enhancing aims undermines the child's right to an open future because such a practice compromises the autonomy of the future child (Mintz *et al.*, 2019). With germline genome editing, anticipatory autonomy rights of the future individual would not be preserved but would rather be taken over by the parents' preferences. In order to establish whether or not the right to have a non-enhanced genome should be considered as a right in trust, the authors consider the features of personhood that develop in children as they mature (Feinberg, 1980): 1) abilities of self-governance necessary for autonomy; 2) skills or acquired abilities; 3) options or opportunities; 4) preferences based upon desires and values. Mintz and colleagues maintain that if one considers germline engineering in light of Feinberg's four features of personhood, the child's potential to exercise autonomy is preserved only if we postpone genetic engineering. Autonomy is more important than any capacity that can be provided through germline engineering other than life itself (Mintz *et al.*, 2019). Furthermore, at the time when germline genome editing is viable, namely at the *in vitro* stage, parents cannot know what capacities, options, skills or preferences the future individual will want to have. Therefore, the genetic manipulation might be unnecessary, since one could open up possibilities that the future child would not want to pursue or, at the worst, it might be counterproductive since one could risk restricting possibilities that the child would want to pursue (Mintz *et al.*, 2019).

In short, forcing a future child into the parent's notions of the good life through genetic enhancement would likely violate CROF. From this perspective, germline genome editing should be allowed only for saving a life or mitigating a life of pain and suffering and not for improving any trait in the future individual.

This view presents some weaknesses that make it difficult to support it. Firstly, there are numerous genetic treatments, other than those aimed at saving a life or mitigating a life of pain and suffering, which do not undermine the child's right to an open future. It is worth noting that I agree with Mintz and colleagues when they claim that providing some specific traits could undermine the development of future life's autonomy by sticking the child in a life plan that has been decided by her parents. For instance, modifying an embryo to obtain a child with specific personality traits is a direct infringement of CROF. Indeed, parents' wishes could convey the prejudices of a certain historical age preventing the child from having an open future. John Mackie in this regard states: "if the Victorians had been able to use genetic engineering, they would have made us more pious and patriotic" (Mackie cited in Glover 1984, p. 149). However, it does not follow that *every* kind of enhancement undermines CROF. Genetic enhancements, such as expanding the future individual's lifespan, enhancing human vision or even improving memory or general intelligence, should not be considered against the child's open future; on the contrary, these interventions may even enlarge the range of the possible life plans of the future individual or, at least, help her to make better choices about her life (Schaefer *et al.*, 2014).

Furthermore, contra Mintz and colleagues, it seems reasonable to maintain that CROF should also consider some aesthetic enhancements as ethically legitimate interventions. Let us consider, for instance, choosing the hair and eye color of the future individual according to the parents' preferences. While one could argue that in some cultures around the world having some particular aesthetic traits could limit the range of life plans, in Western society it seems quite difficult to support that view<sup>2</sup>. In this context, changing these traits would not necessarily close the door to an open future, hence they should be considered morally legitimate.

Here, Mintz and colleagues would reply that these kinds of aesthetic enhancements (and generally every genetic enhancement) are not in line with the second formulation of the categorical imperative provided by Kant, according to which people should be treated not as merely means but also as ends in itself (Kant, 1993). Indeed, in their paper, Mintz and colleagues theoretically ground CROF on the second formulation of the Kantian imperative from which they derive the concept of autonomy. From this perspective, choosing the hair or eye color of the future child should be considered an instrumentalization of the embryo who is considered here as a mere means to create the parent's ideal child. Since embryo and person, such as child and adult, are biological stages of growth interrelated on the same continuum of humanity, genetically enhancing the embryo would undermine the autonomy and human dignity of the future individual.

Nevertheless, even if we accept the notion of autonomy provided by Kant, it seems quite hard to support the thesis according to which the aforementioned aesthetic enhancement should be banned. Mintz and colleagues give an overly strong interpretation of Kant's principle and this makes it too demanding and difficult to apply. Indeed, asking parents to adhere to

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<sup>2</sup> Here I am only referring to aesthetic traits such as the aforementioned hair and eye color. For others, such as color skin, things are more complex. The recent, growing attention to racialization and racial inequalities suggests that having a particular color skin could limit the range of life plans even in Western societies. In this paper, I do not want to deal with this delicate and important issue which requires an in-depth analysis that considers discrimination concerns. For a recent study that analyzes race and economic opportunity in the US see Chetty *et al.*, (2020).

such a strict application of the Kantian principle, assuming its putative plausibility, might make the growing-up process impossible. If we maintain that choosing hair or eye color is a direct infringement of the Kantian principle, many daily actions concerning the relationship between parents and children will have to be considered morally wrong as well: for instance, by choosing a dress with a specific color for a newborn, parents may be treating the child as a means for the satisfaction of having a child who dresses in a certain way; but this seems quite bizarre.

Someone might reply that, whereas choosing the eye color of a person produces a permanent state, this is not so with choosing a dress; hence, the former action should be considered more problematic (from a Kantian perspective) than the latter<sup>3</sup>. However, to maintain that an action is a direct infringement of the Kantian principle only if it has a permanent effect seems quite implausible; one can damage another person even without causing permanent effects (e.g. kidnapping for forty-eight hours somebody who suffers during that time, but who will not have future psychological problems caused by this event). On the other hand, a person can cause a permanent effect on another without exploiting her (e.g. sending children to school where they will develop cognitive capabilities that will change permanently their perceptions and abilities to interact with the world). I argue that the permanent effects of an action are neither sufficient nor necessary conditions to be aligned with the Kantian principle. In the specific context of procreation, what really matters is to avoid taking away future possibilities from the range of the individual's choices.

In sum, to choose hair or eye color, precisely as choosing a specific dress for the child, does not corrupt the possibility for parents to consider the child as an end in herself and not as a mere means. It seems more reasonable to claim that the concept of autonomy is undermined only if parents decide to provide the future child with some specific traits constraining the future possibility of individual choices. Only in this way, parents render the child unable to live autonomously: for instance, providing a specific type of intelligence to the future individual might be considered morally objectionable for the aforementioned reasons.

In line with these considerations and in agreement with several scholars, we can claim that not every genetic enhancement is inconsistent with CROF (Agar, 2004; Buchanan *et al.*, 2009; Marni, 2007; Savulescu, 2007) and that the aforementioned view of this argument does not offer a satisfactory interpretation of it. Furthermore, it is important also to say that, in agreement with Mintz and colleagues, it is nevertheless reasonable to delay enhancement interventions until an individual reaches maturity to decide for herself. However, many genetic treatments would have to be performed very early in life if they are to have an effect (Savulescu, 2007).

So far so good, but in order to clarify what CROF requires parents to do, we need to address also a new question: due to the availability of some genetic enhancements, should we consider them as *only* morally legitimate, and thus permissible but not morally compulsory, or would CROF also imply some moral obligation to enhance the future progeny? In the next section, I will investigate whether CROF requires parents to enhance their progeny.

**5. Genetic enhancement: can we, or should we?**

Someone could argue that, in order to respect the future individual's right to have an open future, parents should not only avoid to deliberately constrain her possibilities, but also enhance her capacities. Eric Schmidt proposes a useful metaphor to explain this position: "imagine a map containing all possible significant experiences, including but not limited to educational, vocational, aesthetic and cultural experiences" (Schmidt, 2007, p. 193). By

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<sup>3</sup> I am indebted to an anonymous reviewer for bringing this issue to my attention.

‘significant experiences’, Schmidt means those experiences that have the potential to change the path of a person’s future. Through genetic modification, parents can modify the child’s map and so modify the child’s range of open futures; they can make genetic modifications that add roads to the map, allowing the child to have significant experiences that the child could not otherwise have had. Hence, such added roads on the child’s map would expand the child’s range of open futures. Schmidt suggests that the CROF approach provides further ethical guidance where Davis’s requirement of substantial constraint does not. Indeed, from this perspective, parents act ethically only if they make procreative choices that expand their child’s range of futures. Since some genetic enhancement, far from restricting a child’s future, may increase the number of possibilities or at least the quality of the child’s future (Savulescu, 2007), conceiving genetic enhancement as permissible but not morally required may not be enough: as a matter of fact, we should face a moral obligation to use enhancements as instruments to enlarge the openness of the child’s future. Such an interpretation of CROF also seems in line with Feinberg’s view: indeed, as Claudia Mills suggests, he would claim that parents have a duty not to isolate children intentionally from other ways of life and to make sure that their children will learn a variety of ways of life (Mills, 2005, p. 541).

CROF would, in fact, require that parents comply with both negative and positive duties towards progeny. However, claiming that CROF calls for some positive parental duties, rather than only negatives ones – namely, seeking to provide an open future, rather than just to avoid constraining it – is not enough to claim the existence of a moral obligation to enhance their progeny. In order to support the existence of a moral duty to genetically enhance the progeny, we should, in fact, assume a maximizing conception of the child’s right to an open future. According to the maximizing view, parents have a moral obligation to open as many options as possible for the future person, namely, maximizing her possibility to make the widest variety of choices in her life because it may maximize the child’s chances for self-fulfillment (Feinberg, 1980). From this perspective, genetically enhancing the progeny is a way to enlarge the child’s chances for self-fulfillment and, as a consequence, parents should be morally committed to employing them.

Nonetheless, the maximizing view is difficult to embrace due to its implausible implications (Millum, 2014). Firstly, the moral obligation to open as many options as possible forces parents to make some unrealistic assumptions about possible future desires of the child and to give up, or at least reduce dramatically, the importance of their own ideals for their children’s lives (Ruddick, 1999). Secondly, according to Mills, CROF in its maximizing view is even impossible to satisfy, since parents would never be able to avoid violating the child’s right to an open future (Mills, 2003). Accordingly, this approach implies a too demanding and impossible neutrality about values that can produce a sort of alienation of the child from her parents. Thirdly, from a more practical point of view, according to Francis Kamm, the maximizing view also bizarrely requires parents to use genetic modification to alter the makeup of individuals who would naturally have an excessively constricted range of options, even if those options are very good ones (Kamm, 2005). Therefore, there seem to be good reasons to reject the maximizing view.

A more plausible interpretation of the parental duties required by CROF – one that is in contrast with the maximizing view – is the satisfying view (Buchanan *et al.*, 2009; Lotz, 2006) or what Joseph Millum calls the moderate interpretation of CROF (Millum, 2014). From this perspective, CROF only requires that the future adult be able to choose among some, perhaps particularly important, sets of options. Negatively construed, this requires allowing the child to acquire certain skills and ensuring that certain options are not closed off. Positively construed, it requires helping the child to develop key skills and providing her with the resources to choose among a reasonable range of opportunities (Millum, 2014). By a

'reasonable range of opportunities', I mean varied, relevant, culturally meaningful options, which, in a broad sense, can be considered representative of the diversity of ways of life (Lotz, 2006). Furthermore, the satisfying view does not call for the level of neutrality required by the maximizing view, but rather for a sort of 'approximate neutrality' (Lotz, 2006). Following the satisfying view, I argue that it is too demanding to morally oblige parents to expand their child's range of futures through genetic enhancement and that this does not constitute a reasonable interpretation of CROF. In fact, it seems sensible to claim that non-enhanced children already have a reasonable array of opportunities: however, in order to justify this claim we must introduce the concept of what Allen Buchanan calls "dominant cooperative framework". In the next section, I present this concept and defend the view according to which having a reasonable range of opportunities depends on the setting of the dominant cooperative framework.

**5. The reasonable range of opportunities and the dominant cooperative framework**

With "dominant institutional infrastructure for productive interaction", or more simply, "dominant cooperative framework", Buchanan refers to the set of basic institutions and practices that enable individuals and groups in a given society to engage in ongoing mutually beneficial cooperation (Buchanan, 1996; 2011; Buchanan *et al.*, 2009). Participating successfully in this mutually beneficial cooperation allows people to have a reasonable range of opportunities within a society, namely to have access to a great number of careers, life plans and social positions that would not be feasible outside that framework. Indeed, most of the desires that an individual can have during her life can only be realized within a cooperative social context: in this way, we can claim that having a reasonable number of opportunities for a person depends on being included, and to what extent, in the dominant cooperative framework of a society.

Buchanan explains the dominant cooperative framework using the analogy of the card game: this analogy can show the relationship between having a reasonable range of opportunities and the dominant cooperative framework. In fact, within a card game, we can appreciate that a number of experiences, such as winning, losing, having fun and talking to other players, can be enjoyed only by people who are playing the card game. However, in order to play such a card game and be able to enjoy those experiences, players should decide which specific game, defined and governed by which set of rules, they will be playing. People or groups have different skills and abilities: someone might prefer playing Bridge, a complex game, whereas others, for instance, the youngest people who do not possess the cognitive skills to play this card game, would prefer a simpler one. Moreover, others might also want to play a harder game than Bridge, since their cognitive skills are very high. Here, with Buchanan, we shall note that the ability to perform the tasks required by the institutional rules of interaction – hence, having access to a great number of opportunities – “depends not just upon what skills and talents the individuals have, but also upon the character of the demands of the forms of interaction specified by the rules” (Buchanan, 1996, p. 40). From this perspective, choosing which rules should govern the dominant cooperative scheme means choosing who will be able to have a reasonable range of opportunities within society. As a matter of fact, an individual will be able to participate successfully in the interaction if there is a fit between her abilities and the demands of the form of interaction (Buchanan, 1996). Deciding which rules should guide the dominant cooperative framework within a society is a complex ethical task that is not the aim of this paper to discuss, since we are investigating the problem only through the lens of CROF. Here, we can only observe that usually the rules of cooperative frameworks are decided by the majority of people who join them. As a consequence, if the majority of people possess specific cognitive and physical skills, it is reasonable to claim that the dominant cooperative framework chosen will require cooperators to possess the



aforementioned traits to have access to the majority of careers, life plans and social positions. It is important to notice that possessing the cognitive and physical skills of the majority of people within a society is not a sufficient condition to have access to a reasonable range of opportunities: people need also other primary goods, such as education or healthcare, in order to realize their life plans. However, having such traits should be considered a necessary condition, although it is not the only one nor a sufficient one.

Nowadays, the majority of people within our society have the normal, namely non-enhanced, functioning capabilities of human species; therefore, it is likely that the dominant cooperative framework generally shall be based on those capabilities. In fact, it would seem bizarre for the cooperative scheme in our society to require people to fly, or to have an enhanced view, or to have physical and cognitive capacities and endurance above the human standard, since no one in our society possesses these traits. The aforementioned skills are just not necessary to have the possibility to realize a great number of life plans and then having a reasonable range of opportunities. Hence, having a reasonable range of opportunities depends on the conformation of the dominant cooperative framework which in turn depends on the functioning capabilities of the majority of human beings in a given society.

Therefore, since CROF requires that parents should guarantee a reasonable range of opportunities, such a moral obligation is strictly dependent on the dominant cooperative framework within a specific society. As claimed above, it is sensible to maintain that unenhanced people – namely, individuals who possess the normal functioning capabilities of the human species – can already join the dominant social framework and, as a consequence, can have a reasonable range of opportunities. Thus, we can justify the claim according to which parents who decide not to genetically enhance their child are not infringing CROF. Therefore, those enhancements that are in line with CROF should be considered permissible, but this argument does not necessarily call for a moral obligation to genetically enhance the progeny.

Linking CROF with the concept of the dominant cooperative framework allows us to provide another important consideration: cooperative frameworks change over time and, since the moral obligations towards progeny required by CROF regarding genetic enhancement depend on the dominant cooperative framework, such duties change as the dominant social framework changes. Let us consider an example outside the topic of genetic enhancement to clarify this important point: in the past, in order to have a reasonable range of opportunities within Italian society, it was not strictly necessary to have a good knowledge of the English language. As a matter of the fact, a large number of courses of study and careers did not require such knowledge. However, in recent years, due to economic, political, and social dynamics, the English language has become a requirement for many careers and life plans; moreover, compulsory school started providing English lessons and, nowadays, a growing number of Italian people speak English as a second language. In this context, we can appreciate a change of the dominant cooperative framework; whereas in the past English was not required to have a reasonable range of opportunities, nowadays it is. Hence, assuming that the English language is a requirement to access a reasonable range of opportunities, nowadays CROF requires parents to enable their children to attend English lessons. On the contrary, this obligation would not have arisen in the past when the English language was not required to access a reasonable range of opportunities.

In the same way, we should offer similar considerations in the field of genetic enhancement: as I have claimed above, some genetic enhancements, such as improving memory or general intelligence, are not in contrast with CROF, hence they should be considered ethically legitimate. As a consequence of the permissibility of such genetic enhancements and their

## **7. Changing the framework, changing the obligations**

availability, a great number of people in a society might be enhanced and this could have some challenging consequences on the assets of the dominant cooperative framework. Assuming a scenario in which the majority of human beings, but not all, are enhanced to have much greater cognitive abilities and significant augmented capacity for complex practical reasoning, the interaction between enhanced people becomes more sophisticated, more productive than the interaction between non-enhanced people (Buchanan, 2011). Since the functioning capabilities of the majority of human beings in a given society determine the rules shaping the dominant cooperative framework, there is a reasonable likelihood that the framework will be transformed as the number of enhanced people increases within society. For instance, the mainstream economy and the most important political processes will be structured for enhanced people and no longer for those who are unenhanced. The result is that the unenhanced people will no longer have access to a reasonable range of opportunities in a given society. Therefore, in these specific circumstances, the moral obligations required by CROF will change, compared to a situation in which the dominant cooperative framework was shaped by non-enhanced human beings. Indeed, since according to the satisfying view of CROF we have a positive duty to guarantee a reasonable range of opportunities to our progeny, in this context we need to enhance them because the only way to have a reasonable range of opportunities in the new dominant cooperative framework is being enhanced. Summarizing, the moral obligations required by CROF are fluid over time and they might change as the dominant cooperative framework transformation.

**8. Conclusion** I have argued that CROF is not in contrast with genetic enhancements, as long as they do not compromise the development of the child's future life or their autonomy or confine her to a life plan decided by her parents. Genetic enhancements such as expanding the future individual's lifespan, enhancing human vision or even improving memory or general intelligence in some cases may not be considered against the child's open future. However, it is nevertheless reasonable to delay enhancement interventions until an individual reaches maturity to decide for herself except those that would have to be performed very early in life to have an effect. Furthermore, I argued that CROF requires that parents should not be required to open as many options as possible to their children, but rather should provide a reasonable range of opportunities. I have also claimed that having a reasonable range of opportunities depends on the dominant cooperative framework, which may change over time. As a consequence, the moral obligations required by CROF change as the dominant cooperative framework changes. In light of this, I argued that, according to CROF, nowadays, within the current dominant cooperative framework, parents are not obliged to genetically enhance their children since a non-enhanced person who possesses traits within the normal functioning of the species already has access to a reasonable range of opportunities. However, if the dominant cooperative framework changed, and if it required cognitive and physical capabilities that can only be reached through genetic enhancement, then parents, in order to provide a reasonable range of opportunities for their future children, would be morally obliged to enhance them.

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