

Beyond an Open Future

Cognitive Enhancement and the Welfare of Children

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Abstract: Discussions about the ethical permissibility of pediatric cognitive enhancement frequently revolve around arguments about welfare, and often include an appeal to the child's right to an open future. Both proponents and opponents of cognitive enhancement claim that their respective positions best serve the interests of the child by promoting an open future. This article argues that this right to an open future argument only captures some of the risks to the welfare of children, therefore requiring a broader ethical approach. Further, it suggests that a thorough moral assessment of the ends pursued is needed before concluding on the moral permissibility of cognitive enhancement in children, which ultimately hinges on the effect on the overall welfare of the child, beyond an open future.

Keywords: pediatric cognitive enhancement; cognitive capacities; welfare of the child; right to an open future; best interests of the child

Introduction

The advent of biomedical and genetic technologies promises new ways of changing various aspects of human life, including the improvement of physical and mental traits. Identifying the biological underpinning of “general intelligence (*g*)”¹ with the goal of increasing it has become the focus of current research efforts,² presumably because intelligence is perceived as an all-purpose good by many, something that people are assumed to want whatever their values and life plans, instrumentally valuable for most people in most circumstances. Or put more simply: more of it cannot be bad. This idea is typically linked to the notion of well-being and the ability to lead “a good life.”³

Whereas cognitive enhancements (CE) are eagerly anticipated by enthusiasts, critics also express concerns about such interventions,⁴ especially when these involve children.⁵ In this debate, agreement appears limited to the moral and legal responsibility of parents for the well-being of their children,⁶ with both

sides arguing that their respective position will best serve the well-being of children. In doing so, they both rely in part on one particular argument: the child's right to an open future. This suggests that there is something odd here. How can CE both further openness of a child's future and be a threat to it?

In this article, I argue that this discrepancy stems from an incomplete assessment of the morality of CE interventions in children. Proponents tend to demonstrate too strong a reliance on outcomes of CE to justify their position, whereas opponents largely focus on critiquing the means to make their claim. What both sides fail to achieve, however, is a thorough moral assessment of the ends that are being pursued.⁷ This, I argue, is an inadequate approach, because in deciding on the moral permissibility of CE, both means and ends need to be considered. Only if both turn out to be ethical can we judge the moral permissibility of CE in children, which will ultimately hinge on the effect on the welfare of children.

As I will demonstrate, the right to an open future argument alone is insufficient to reach such positive conclusions, because there are several scenarios in the present CE context in which the welfare of children is at risk independent of issues of openness of their future.

The starting point of my argument will be a short review of the right to an open future, as first expressed by Joel Feinberg, and the related question of the value of openness. Following from this, I will present three different scenarios in which the moral permissibility of CE is typically controversial, and in which the concerns are framed in terms of a right to an open future. These examples will highlight how the open future argument leaves gaps in the protection of children's welfare. "The Importance of Ends" will be dedicated to the importance of due consideration of the ends pursued by CE. The examples given in the previous section will help to demonstrate where ethical problems might arise, even when openness of future is not an issue, and how a combined approach might be more adequate in addressing welfare concerns in the CE context.

The Right to an Open Future

One of the most prominent arguments in the CE debate relies on the notion of the child's "right to an open future," first introduced by Joel Feinberg.⁸ Under this one right, Feinberg subsumes several other rights, which in the case of children are held in trust for them until they are sufficiently self-determining persons to make their own autonomous decisions. In essence, he is concerned with protecting the future autonomy and self-fulfilment of children, which might be forfeited if the wrong decisions are made on their behalf. Rather than being a purely qualitative statement, however, "wrong decisions," according

to Feinberg, are those decisions that are of a limiting nature with regard to the capacity for self-fulfilment and autonomy. It is, therefore, conceivable that even decisions leading to a benefit for a child could be considered wrong should they limit the child's capacity for making his or her own choices as an autonomous adult. Some choices may no longer be available, as they would have been foreclosed by previous decisions made by others on his or her behalf. Such decisions would be said to interfere with the child's right to an open future.⁹ Examples include allowing Jehovah's Witness parents to refuse a mother's life-saving blood transfusion,¹⁰ or allowing the Amish to keep their children out of state schools.¹¹

According to Feinberg, a child has a general right to have his or her "future options kept open until he is a fully formed self-determining adult capable of deciding among them."¹² This is of immense importance: "Children are not legally capable of defending their own future interests against present infringement by their parents, so that task must be performed for them, usually by the state in its role of *parens patriae*."¹³

This appears a straightforward claim on future autonomy and self-fulfilment, which ought to be preserved. Given the importance we generally attach to autonomy, it is intuitively appealing. However, Feinberg himself identifies at least four distinct types of autonomy, and it is clear that he is not primarily concerned with mere *capacity* (to govern oneself) when he defends children's right to an open future, but rather with autonomy as a *condition*.¹⁴ The intuitive appeal of such a claim obfuscates the complexity of the underlying issue. Different values have to be carefully balanced. As Jonathan Glover notes, when it comes to parental decisions about children's genetic characteristics, there is a conflict between self-creation

and independence: "We value an open future, one that leaves us some scope to shape ourselves. We also value our independence, the fact that our nature is not just the product of decisions by others."¹⁵ Because of the unavoidable influence of both genes and parenting choices on a child, both self-creation and independence can only ever be partial:¹⁶ "Some parental choices (genetic or environmental) may increase our abilities and so give us a more open future with greater scope for self-creation. But the role of the parental choices in itself reduces our independence."¹⁷ Glover notes that we might well be prepared to sacrifice some independence when parental choices are in our interest, even if such choices were made "for really bad reasons."¹⁸ This suggests that the reason for valuing openness originates both from the value attached to autonomy, as well as from a belief that having more options to choose from will lead to a better life.

It is important to remember that Feinberg's concern about the openness of a child's future is not a matter of everyday lifestyle choices such as which style of fashion to follow, but rather with the type of person one can become. This is why in the case of the Amish, he cautions that the state is to take a neutral stance and "let *all* influences [...] work equally on the child, to open up all possibilities to him, without itself influencing him toward one or another of these. In that way, it can be hoped that the chief determining factor in the grown child's choice of a vocation and life-style will be his own governing values, talents, and propensities."¹⁹ Ironically, this is precisely what will preclude a child from being a full member of the Amish community, because this self-government goes against the Amish way of life.²⁰ Consequently, Dena Davis cautions that "those of us who would make arguments based on the

child's Right to an Open Future need to be clear and appropriately humble about what we are offering,"²¹ because the preservation of an open future might well mean foreclosure of one particular future, for example that of full and proper membership in a certain community.²² It is, therefore, not merely the number of choices a child has that matters, but rather the ability and opportunity to make those choices in the future. This is because it is important to be "recognized as the kind of creature who is capable of making choices. That capacity grounds our idea of what it is to be a person and a moral agent equally worthy of respect by all. But, of course, that it is better intrinsically to be a creature that makes choices does not imply that it is always an improvement to have more."²³

Choice

Although as a rule of thumb we can say that we would prefer having more choice than less,²⁴ this does not mean that it is necessarily "better" in a morally significant sense. Gerald Dworkin, in a comprehensive account, raises the issues of decisionmaking costs, responsibility for choice, and pressure to conform to caution against the assumption that more choice is always better.²⁵ Barry Schwartz similarly argues that we can in fact have too much choice, which ultimately results in reduced well-being.²⁶ Unlimited individual freedom and self-determination can actually become so burdensome that it is difficult to defend a claim of the intrinsic value of choice. Even without any such negative experiences in the face of choice, Dworkin argues it is implausible to make such a claim, because in the absence of a special incentive (e.g., a financial reward) one has no reason to prefer having a choice between lower-ranked alternatives to

receiving one's number one choice,²⁷ which is precisely what would be the case if choice had intrinsic value. The right to an open future can, therefore, be said to be more about becoming a person capable of making self-determined life decisions, rather than about having as many choices as possible.²⁸

Although it seems quite improbable that Feinberg was thinking about CE in children when he first introduced the idea of a child's right to an open future in 1980, he was concerned with the appropriate level of parental authority.²⁹ In light of the aforementioned scientific progress and enthusiasm for CE, this question is more pressing than ever, making it a useful exercise to apply Feinberg's principle in this newly arisen context to determine whether it can provide any guidance as to what the ethically right thing to do is: where the line between parental autonomy and children's welfare interests ought to be drawn.³⁰

The Right to an Open Future: Case Studies

Given the importance of the welfare of children and the fact that the right to an open future argument is advanced both by those who claim that CE is morally problematic and by those who claim the opposite, I will consider three examples to demonstrate in what ways the right to an open future argument is insufficient protection for children's welfare.

Case Study 1. Pre-conception CE: Genetic Selection

In a recently published article,³¹ Ole Martin Moen suggests moderate financial incentives for women who agree to use sperm from highly intelligent donors instead of their husbands, in order to increase overall intelligence levels in our society. Moen believes that

"[i]f we could raise global IQ, we would reap significant benefits. Smart people tend to benefit themselves, but, just as importantly, they also benefit others, for an invention or a smart solution is a value that can be utilized again and again."³² He is convinced that "we need all the IQ points we can get to solve the world's challenges."³³

The idea of using genetic selection to increase intelligence of children is not new, but has had limited success in the past.³⁴ What is new about Moen's proposal is the idea of monetary incentives paid by the state to increase societal intelligence levels. Although there are many things to be said in response to this idea, for present purposes what matters is how the right to an open future argument can be used in response to such proposals.

Unfortunately, we do not even get as far as applying the argument, for the simple reason that there is no one whose right to an open future can possibly be said to have been infringed upon. In the present scenario, a non-identity problem³⁵ arises, because the child born is not identical to the one who would have been born without the intervention; that is, use of this particular donor sperm. To say that the child's right to an open future has been interfered with because of the intervention is absurd, because that particular child would not exist without that intervention.

The logical inapplicability of the right to an open future in this case does not mean that Moen's proposal is morally unproblematic. Critics might look to Kant's categorical imperative³⁶ and point out that the suggestion results in treating children as mere means, rather than ends in themselves.³⁷ This is because it is an essential component of Moen's argument that the means—incubated genetic selection—are justified by references to the outcomes he expects from

such an intervention, although one might also point to an intrinsic value of high intelligence for the individual.³⁸

Anders Sandberg urges the focus to be shifted from the means “to actually discuss the ends for which enhancement is used,”³⁹ which for him is the development of human well-being. This I find too unspecific in the present scenario, because Moen is explicitly concerned with solving larger societal problems, not with increasing individual well-being, and this raises several additional questions. First of all, there is an empirical question of whether the expectation of societal gains from greater intelligence is realistic at all,⁴⁰ and second, there is a moral question as to the grounds on which those children can be held responsible for solving society’s problems: the ends that Moen is pursuing. In summary, his proposal appears to be a recommendation to treat children as means, which he justifies by reference to expected but empirically unproven outcomes.⁴¹

These outcomes are not equivalent to the ends. In Moen’s proposal, the ends are the use of geniuses to solve the world’s problems, whereas the outcomes may be all sorts of positive, negative, or neutral results, the most obvious being a more intelligent generation of children. Although it can plausibly be argued that the resulting children have their right to an open future interfered with, this is not because of the intervention itself but because of the plans made for them, the ends for which they were created.⁴² Even this is disputable, however, because in the absence of any further efforts to exercise those plans, their future will not be less open. I will return to this point in the third case study below.

Case Study 2. Pharmacological CE

The case of an American physician received much media attention a few

years ago. Admitting to prescribing Adderall to children from low-income families even in the absence of attention-deficit/hyperactivity disorder (ADHD), Dr Michael Anderson said: “I don’t have a whole lot of choice. We’ve decided as a society that it’s too expensive to modify the kid’s environment. So we have to modify the kid.”⁴³ This approach has recently been endorsed by Keisha Ray, who suggests that stimulant use might be an appropriate remedy for social inequalities.⁴⁴

Although Ray does not directly invoke Feinberg’s right to an open future, she explains her goal as wanting “to make undesirable environments have less control over the futures open to disadvantaged children and to explore ways—medical and/or social—to create new opportunities for healthy lives.”⁴⁵ Does this type of policy approach infringe on the right to an open future? The importance of effective education for future life outcomes is well established; therefore, it could be argued that such an approach leads to a more open future. On the other hand, most of us would probably hope for an environmental modification rather than modifying children to circumvent problems of social inequality, because it conflicts with our idea of self-creation and independence.⁴⁶

It becomes clear is that a straightforward application of the right to an open future is not always possible in such highly complex scenarios, and, therefore, we need more to explain our concerns with this type of proposal.⁴⁷ One worry is the likely futility of such an intervention. Scientific evidence suggests that psychotropic drugs are largely ineffective in healthy individuals,⁴⁸ rendering the attempt a waste of scarce financial resources. Another major concern relates to the self-image of those children and their relationship with drugs,⁴⁹ which might be negatively impacted by the administration of stimulants to address

their academic problems. Michael Sandel describes the use of such drugs as “a bid for compliance, a way of answering a competitive society’s demand to improve our performance and perfect our nature. This demand for performance and perfection animates the impulse to rail against the given. It is the deepest source of the moral trouble with enhancement.”⁵⁰ Related to this is the concern about the parent–child relationship, when drugs are prescribed for educational purposes, because it removes the dynamic process of children negotiating their identities within the family and cultural context; instead, psychopharmacology is used to elicit a certain behavioral response.⁵¹

Again, the means (drugs) are not what makes Ray’s proposal morally problematic; the real issue arises with regard to the ends being pursued. Although it appears that the goal is to improve children’s educational outcomes and hence their well-being, which would be supported by the right to an open future argument, in reality what is being sought is a cost-effective quick fix for society’s ills at the expense of individual children.⁵²

In this case, the right to an open future argument to some extent explains the problems with this type of CE, but fails to encompass all of the underlying issues.

Case Study 3. Post-conception CE

There are many other ways in which CE could be brought about. These might include gene editing in embryos, gene therapy in infants, or, arguably, even conventional methods such as education and training,⁵³ and prenatal nutrition, which can cause significant changes in genetic expression.⁵⁴ All of these may affect cognitive capacities of the resulting born child.

In contrast to the first example, there is now a person who is affected by the intervention; therefore, issues of identity might arise and impact on the openness of the child’s future. However, this still makes no logical sense, because if an identity-affecting change occurs, the resulting person is not who that person would have been in the absence of such intervention, and therefore cannot be said to have “a legitimate grievance”⁵⁵ with regard to his or her identity.

Regardless of whether an intervention turns out to be identity changing,⁵⁶ enhancement critics such as Jürgen Habermas remain concerned. For Habermas, what matters is the child’s sense of self being affected by *genetic* enhancement, which he singles out because of a perceived asymmetrical relationship between the parents and the child in the case of genetic enhancement.⁵⁷ He argues that in an ordinary situation, children can negotiate with their parents, oppose or ignore their parents’ views, and decide for themselves. In the case of genetic enhancement, Habermas argues, this opportunity does not present itself.

My response to this is twofold: first of all, it seems naïve to believe that other types of intervention, such as education, cannot have equally profound effects and that they instead provide a full opportunity for a negotiating relationship with one’s parents.⁵⁸ Habermas, like many enhancement critics, appears too focused on the means. Education serves as a useful example here. Teaching children literacy, numeracy, and various academic skills will lead to a more open future and assist in their development into autonomous, self-determined adults. However, education can also be used as a tool to indoctrinate children, with very harmful effects on the sense of self and no negotiating of one’s identity

taking place.⁵⁹ The second point relates to the fact that knowledge of how one was created is insufficient to substantiate interference with the right to an open future. Mere belief that one's future "is already determined, when that belief is clearly false and supported only by the crudest genetic determinism" might lead to psychological harm, but cannot be said to infringe on the right to an open future.⁶⁰

Case Analysis

The preceding case studies demonstrate that much attention is being paid to the means of achieving CE, with "high-tech" interventions such as psychopharmacology and genetic technology appearing far more controversial than the more conventional methods of education, training, and nutrition. The moral comparability of old and new ways of shaping children should not be seen as an encouragement to readily accept emerging technologies, such as genetic engineering, but should prompt parents to carefully consider their parenting goals.⁶¹ As I have argued, if we are really concerned about the welfare of children, we need to address the ends being pursued independent from the means.

The Importance of Ends

Most parental decisions seem to fall into the category of ethically unproblematic choices in the Feinberg sense, in that they will have an effect on the child's life to some extent: in addition to the genetic preconditions, parenting will be the most important factor in shaping the child's character and influencing preferences, skills, and choices. Only some of these parental decisions would, however, qualify as posing a threat to an open future; that is, the future autonomy and ability for self-fulfilment of

the child. Whereas it seems clear that choosing white rather than green clothes for a child will not pose such a threat, it already becomes more complicated when the choices made are pink for girls and blue for boys. Other choices are even more difficult to judge, such as genetic selection for non-disease traits such as sex, which is already being practiced, and which is criticized by some for presenting an ethical problem, "because it promotes gender role stereotyping and encourages parents to invest heavily in having certain types of children. This combination of investment and stereotyping makes it more difficult for the child to grow and develop in ways that are different than, perhaps, even in conflict with, parental expectations."⁶²

Why is it so difficult to judge these choices? Most of the issues arising (or likely to arise) with regard to CE are simply stronger versions of existing child-rearing problems. Unreasonable or excessive parental expectations are already commonplace in many parent-child relationships;⁶³ however, the possibilities of CE appear to exacerbate the problem. Expectations may be significantly and unrealistically raised by promissory marketing claims of CE technology providers, and eventually interventions may make possible "more radical methods for *imposing* parental or cultural preferences onto children. [...] For example, parents and schools may soon choose to use biomedical technologies to enhance working memory, mathematical/spatial intelligence, emotional self-regulation, or talent at sports."⁶⁴ These issues are not new, but CE increases the urgency with which these problems will have to be addressed, especially if it were to become widespread, and if our society continues to become increasingly competitive.

The difficulty with judging the ends pursued by CE lies in the fact that for

the individual child, being cognitively enhanced might actually be beneficial. It is hard to argue against the importance of cognitive capacities in developing autonomy, and in successfully navigating through life's complexities. It is, therefore, no contradiction to argue that enhancing cognitive powers works in favor of a more open future. For this reason, a prohibition on CE research seems undesirable; keeping an open mind about new technologies and the possibilities offered by them is important to allow us to evaluate consequences carefully before reaching moral conclusions.⁶⁵

A child's development, however, depends on more than available cognitive capacities, and whether or not a child will develop into a fully autonomous, self-determined adult will be affected by the type of goals pursued by parents and by society. The latter is important, because should a proposal such as Moen's make it into public policy, it will be society, not just parents, setting the goals for CE children, placing on them the burden of making our world a better place.⁶⁶ This is the dream of many social engineers, who believe in the strategic shaping of future generations "by means of instrumentally targeted interventions that change their biological nature."⁶⁷

Parental expectations are no less problematic. The negative impact of high achievement goals on children is generally well established.⁶⁸ Assuming that parents do not take decisionmaking with regard to their children lightly, it seems fair to argue that they are likely to have *something* in mind when they opt for CE interventions. They might hope for some advantage or benefit for their child in comparison with the unenhanced "version" of the same child,⁶⁹ but this could be no more than a vague hope that their child will be better off in some sense, and the pursued

ends might actually be mistaken ideas about what is "good."⁷⁰ The motivations parents have for the choice to enhance have important implications for the moral permissibility of the selection.⁷¹ The greater the investment required for an enhancement—including financial, personal, and administrative effort—the more likely it is that parents will feel entitled to the desired result.⁷² Empirical research into the preferences for choices of donor gametes confirms this idea to some extent,⁷³ with an increasing number of prospective parents seeking out "the ideal donor."⁷⁴

However, it would be premature to conclude from this that all parental choices for CE are morally problematic. Not all motivations are the same.⁷⁵ In the absence of specific expectations attached to such CE interventions and if no particular ends are being pursued by parents and/or society, it would be hard to uphold a claim that CE infringes on a child's right to an open future. The enhanced child would merely be one with greater cognitive powers, which might render the child different from other children or to a prior "version" of the same child (depending on the type of intervention used); but as for most non-disease traits, it seems fair to argue that the outcome is hardly ever so bad as to foreclose a significant number of opportunities; the child's future is still open, and the opportunity for full autonomy and self-determination is still there, even if the child is not the same as that child would have been without the CE intervention.

In summary, the reasons for choosing a particular type of enhancement are decisive for the moral permissibility of the enhancement in question, because the attached expectations are what may restrict the child's future freedom.⁷⁶ This is true even when the trait selected is deemed intrinsically valuable, as is often argued in the case of intelligence.⁷⁷

An example are parents who desire both a child of great intelligence with maximum income potential to ensure the financial security of the family, and a maximally empathetic, family-oriented child who will happily care for his or her elderly parents. Although we are currently a long way off from such ideas becoming reality,⁷⁸ it is worth considering the ethical issues that might arise once such technologies become available, especially as there are huge economic interests at play that will likely lead to significant marketing efforts to parents, with auspicious claims influencing parental expectations. Relevant research is already underway,⁷⁹ making these kinds of ethical reflections inevitable.

Conclusion

In this article, I have argued that CE in children can only ever be justified if both the means to achieve it and the ends that are being pursued are morally permissible, and have criticized the current state of the debate for its reliance on the right to an open future as protection for the welfare of children. As a remedy, I have suggested focusing on the ends pursued by any CE intervention, rather than the framing of the moral concerns merely in terms of openness of future. It has become clear that the right to an open future cannot provide all the answers to the protection of the well-being of children.

One of the difficulties in the CE debate lies in our incomplete understanding of cognitive capacities in general, and general intelligence specifically, and their relevance for leading a good life. Thorough research into this field is strongly advisable, before there are serious discussions about proposals such as Moen's or Ray's. As a starting point, the longitudinal studies into the lives of gifted children might provide some insight into the significance of

greater cognitive capacities,⁸⁰ but broader and complex issues such as child development, education, and social inequality need to be examined, preferably through an interdisciplinary research approach. In addition, as I have argued in detail elsewhere,⁸¹ CE by no means guarantees greater success or achievement for a child, but initially merely results in increased cognitive *potential*. Only if nature meets nurture will this additional potential make a difference in outcome for the child (as for the rest of us). Much more will have to be done for this to translate into actual achievements or performance, let alone increased well-being.⁸²

The appeal in focusing primarily on the means of CE is understandable, given that it is so much harder to regulate the ends. It is impossible to fully know what motivates parents, not only to have certain types of children, but to have children in general. This difficult step must, however, be taken in order to show respect for both parental autonomy and the (future) autonomy of children. The right to an open future in many cases helps us understand what is at stake, but where it does not suffice as an explanation, as in the abovementioned case studies, we should not be tempted to forever twist the concept so as to fit our concerns under its umbrella, but should instead focus on the ends in more general terms. It seems entirely plausible to argue that we have moral concerns about the consequences of adopting the proposals from the first two case studies, without having to relate them to the openness of children's futures. A common worry is the slippery slope we might be headed toward,⁸³ which too seems not entirely unreasonable considering the proposals mentioned. Jonathan Glover makes a valid claim when he points to the "recurring theme of overconfident reconstruction" and the human costs involved in the

failed projects of missionaries, communists, and capitalists.⁸⁴ Similarly, Michael Sandel cautions that engagement in CE activities for success in a competitive society is not a sign of freedom, but rather “the deepest form of disempowerment.”⁸⁵

Whereas Glover and Sandel use this as an argument against (genetic) CE interventions in children, a more liberal approach might be to leave enhancement decisions as much as possible to families, without too much government control.⁸⁶ The Kantian imperative suggests that people should never be treated as means only, to the exclusion of treating them as ends in themselves; however, “as long as the new baby will be loved and nurtured for her own sake it is not ethically problematic to create her at least partially in the hope that she will be of use to someone else.”⁸⁷ There will always be an unavoidable conflict between the values of independence and self-creation when it comes to raising children. We should therefore focus on the ethical limitations to parental decisionmaking while remaining conscious of the fact that a perfectly open future can exist only in theory.

Notes

1. General intelligence *g* is not to be confused with the popular understanding of intelligence as IQ; *g* is the scientific term used to describe general cognitive ability. Gottfredson LS. *The General Intelligence Factor*. New York: Scientific American, Incorporated; 1998.
2. Yong E. Chinese project probes the genetics of genius. *Nature* 2013;497(7449):297.
3. As I have argued elsewhere, the link between cognitive abilities and well-being is far from established. See Krutzinna J. Can a welfarist approach be used to justify a moral duty to cognitively enhance children? *Bioethics* 2016; 30(7):528–35.
4. For example, Jürgen Habermas expresses concern about the negative effect genetic interventions will have on our self-understanding. Habermas J. *The Future of Human Nature*. Polity; 2003, at 25.

5. Although there may be concerns about CE in general, when autonomous adults are concerned there is less contention, partly because of the right to respect for autonomy.
6. Davis D. *Genetic Dilemmas: Reproductive Technology, Parental Choice, and Children's Futures*, 2nd ed. Oxford: Oxford University Press; 2010, at 97. There is general consensus that parents are responsible for their children's well-being, morally and legally.
7. I deliberately draw a distinction between “ends” and “outcomes” of CE interventions: the ends are the goals being pursued (whether successfully or not), whereas the outcomes are the actual results achieved.
8. Feinberg J. The child's right to an open future. In: Aiken W, LaFollette H, eds. *Whose Child? Children's Rights, Parental Authority, and State Power*. Totowa, NJ: Littlefield, Adams & Co.; 1980.
9. See note 8, Feinberg 1980, at 130.
10. See note 8, Feinberg 1980, at 131.
11. This was the issue in *State v Garber*. In: 419 P.2d 896 (Kan. 1966); 1966.
12. Feinberg J. The child's right to an open future. In: Curren RR, ed. *Philosophy of Education: An Anthology*. Oxford: Blackwell Publishing; 2007, at 113.
13. See note 12, Feinberg 2007, at 114.
14. This condition of governing oneself entails the possession and practice of certain virtues, such as self-determination, authenticity, and self-legislation (among others). This raises many questions about the precise nature and extent of autonomy; however, an in-depth critique of Feinberg's approach is beyond the scope of this article. See Feinberg J. Autonomy. In: Christman JP, ed. *The Inner Citadel: Essays on Individual Autonomy*. New York: Oxford University Press; 1989:27–53.
15. Glover J. *Choosing Children: Genes, Disability, and Design*. Oxford: Oxford University Press; 2006, at 71.
16. See note 15, Glover 2006, at 71.
17. See note 15, Glover 2006, at 71.
18. See note 15, Glover 2006, at 81.
19. See note 8, Feinberg 1980, at 136.
20. Davis D. The child's right to an open future: Yoder and beyond. *Capital University Law Review* 1997;26:93–105, at 97.
21. See note 20, Davis 1997, at 96.
22. Davis acknowledges that the case of the Amish appears relatively uncontroversial because of the Amish's particular characteristics. However, she gives the example of female genital mutilation (FGM) to point out the importance of protecting a child's

- open future from any infringement for the sake of community values or membership.
23. Dworkin G. Is more choice better than less? *Midwest Studies in Philosophy* 1982;7(1):47–61, at 60.
 24. See note 23, Dworkin 1982, at 59.
 25. See note 23, Dworkin 1982, at 59.
 26. Schwartz B. *The Paradox of Choice: Why More Is Less*. New York: HarperCollins; 2005.
 27. See note 23, Dworkin 1982, at 60. Note that Dworkin assumes the infinite divisibility of utility for his example.
 28. This explains the case of the Amish, in which the future option of becoming full members of the community might well be taken away from children in favor of their future capacity to make their own self-determined decisions about their lives.
 29. Parental authority and/or choice have different origins in law and in philosophy. Whereas in law all rights of parents ultimately derive from their responsibility for their children, philosophy also recognizes parental autonomy as an ethical value.
 30. Davis believes that the concept of the child's right to an open future provides a new pathway toward resolving the tension between "the beneficence model of patient care and the rights of parents to their own autonomy and to the protection of their family units." See note 6, Davis 2010, at 98.
 31. Moen OM. Bright new world. *Cambridge Quarterly of Healthcare Ethics* 2016;25(2): 282–7.
 32. See note 31, Moen 2016, at 283.
 33. See note 31, Moen 2016, at 283.
 34. Plotz D. *The Genius Factory: The Curious History of the Nobel Prize Sperm Bank*. London: Random House; 2006.
 35. Parfit D. *Reasons and Persons*: Oxford: Oxford University Press; 1984.
 36. Kant I. *Grundlegung zur Metaphysik der Sitten* 1786 [Metaphysics of Morals 1786]. Berlin: Karl-Maria Guth; 2016.
 37. That this results in treatment as mere means seems unlikely, and mixed motives appear more plausible, as is often argued in the case of savior siblings, when children are created/selected for a specific purpose, but are also loved for themselves.
 38. A view I do not share. See note 3, Krutzinna 2016, at 530. Moen later clarifies that he does not believe in the intrinsic value but rather the instrumental value of intelligence. Moen OM. Smarter Babies. *Cambridge Quarterly of Healthcare Ethics* 2016;25(3):515–17, at 515.
 39. Sandberg A. Cognitive enhancement: upgrading the brain. In: Savulescu J, ter Meulen R, Kahane G, eds. *Enhancing Human Capacities*. New York: John Wiley & Sons; 2011, at 85.
 40. Häyry M. Increasing the sum total of general intelligence, as measured by individual IQ scores: what, how, and why? *Cambridge Quarterly of Healthcare Ethics* 2016;25(3):505–14.
 41. Given that there are highly gifted members of our society, I have reasonable doubt that genius creation would work in the way proposed by Moen.
 42. It can, therefore, not be used as an argument against genetic selection.
 43. Schwarz A. Attention disorder or not, pills to help in school. *The New York Times*, October 9, 2012. <http://www.nytimes.com/2012/10/09/health/attention-disorder-or-not-children-prescribed-pills-to-help-in-school.html> (last accessed 25 May 2016).
 44. Ray K. Not just "study drugs" for the rich: stimulants as moral tools for creating opportunities for socially disadvantaged students. *The American Journal of Bioethics* 2016;16(6): 29–38, at 29.
 45. See note 44, Ray 2016, at 33.
 46. Ray R, Davis G. Pharmacists can't administer opportunity: the role of neuroenhancers in educational inequalities. *The American Journal of Bioethics* 2016;16(6):41–3, at 43: "Neuroenhancers do not bring needed resources into schools; thus we ask, even if they do increase one's attentiveness, what good is such attentiveness without teachers, books, and computers to learn from?"
 47. There are obvious practical and empirical issues with Ray's proposal. These are beyond the scope of this article, but see, for example, Sattler S, Singh I. Cognitive enhancement in healthy children will not close the achievement gap in education. *The American Journal of Bioethics* 2016;16(6):39–41, at 40: "The lack of attention to the practical and health dimensions of stimulant drug use is ironic in an article that promotes equality of opportunity and child well-being."
 48. Ragan CI, Bard I, Singh I. What should we do about student use of cognitive enhancers? An analysis of current evidence. *Neuropharmacology* 2013;64:588–95.
 49. Stevenson C. Self-pathologizing and the perception of necessity: two major risks of providing stimulants to educationally underprivileged students. *The American Journal of Bioethics* 2016;16(6):54–6, at 56.
 50. Sandel M. *The Case Against Perfection*. Cambridge: Harvard University Press; 2009, at 61.
 51. Stein Z, Della Chiesa B, Hinton C, Fischer KW. ethical issues in educational neuroscience:

- raising children in a brave new world. In: Illes J, Shahakian B, eds. *The Oxford Handbook of Neuroethics*. Oxford University Press; 2011: 803–22, at 813–4. The authors also point out that at least in the United States, some schools already require the administration of stimulants to students with certain behavioural profiles, and they caution that “[m]andated prescriptions establish an educational process in which the failure to meet specific behavioral expectations is thought to warrant a physical intervention aimed at changing the brain chemistry of the child—the strategic alteration of the child’s dispositions, regardless of the child’s (or her parent’s) dissent.”
52. See note 46, Ray, Davis, at 42; and Warren KB. Promoting stimulants to increase educational equality: some concerns. *The American Journal of Bioethics* 2016;16(6):52–4. Note that these are not necessarily in conflict.
 53. Harris J. *Enhancing Evolution: The Ethical Case for Making Better People*. Princeton: Princeton University Press; 2007, at 14.
 54. See note 39, Sandberg 2011, at 81.
 55. For further details see Chadwick R. Gene therapy. In: Kuhse H, Singer P, eds. *A Companion to Bioethics*: Oxford: Blackwell Publishing; 1998:189–97, at 193.
 56. See note 39, Sandberg 2011, at 81.
 57. See note 4, Habermas 2003.
 58. Wasserman D. My fair baby: What’s wrong with parent’s genetically enhancing their children? In: Gehring V, ed. *Genetic Prospects—Essays On Biotechnology, Ethics And Public Policy*. Lanham, MD: Rowman & Littlefield Publishers; 2003.
 59. Some countries, such as Norway, have been known to remove children from their birth families on the grounds of religious indoctrination and radicalization, even in the absence of corporal punishment. See Berglund N. Norway defends its child welfare laws. *newsinenglish.no*; January 11, 2016. <http://www.newsinenglish.no/2016/01/11/norway-defends-its-child-welfare-laws/> (last accessed 25 May 2016).
 60. Buchanan A, Brock DW, Daniels N, Wikler D. *From Chance to Choice: Genetics and Justice*. Cambridge: Cambridge University Press; 2001, at 198.
 61. See note 50, Sandel 2009, at 61–2.
 62. See note 6, Davis 2010, at 149.
 63. For example, parents choosing sport over music for their child, regardless of the child’s own preferences and talents.
 64. See note 51, Stein et al. 2011, at 814–5.
 65. Harris J. Why human gene editing must not be stopped. *The Guardian*, December 2, 2015. <https://www.theguardian.com/science/2015/dec/02/why-human-gene-editing-must-not-be-stopped> (last accessed 25 May 2016).
 66. See note 39, Sandberg 2011, at 84: “We face many pressing problems which we would be better able to solve if we were smarter or more creative. An enhancement that enables an individual to solve some of society’s problems would produce a positive externality: in addition to benefits for the enhanced individual, there would be spillover benefits for other members of society.”
 67. See note 51, Stein et al. 2011, at 811.
 68. Achievement expectations were found to be most harmful: Ablard KE, Parker WD. Parents’ achievement goals and perfectionism in their academically talented children. *Journal of Youth and Adolescence* 1997;26(6): 651–67.
 69. In a particularly pessimistic scenario, one could argue that parents are selfishly motivated by what is good for them, rather than only by what is good for their children. The truth in most cases probably lies somewhere in between.
 70. For example, parents might hope for a particularly beautiful or smart child in the hope that this will automatically translate into success and/or happiness.
 71. See note 6, Davis 2010, at 37.
 72. See note 6, Davis 2010, at 37.
 73. Many cryobanks are offering a special category for “smart” or highly educated donor sperm, for example, <https://fairfaxcryobank.com/us/about-our-donors#Categories>. (last accessed 25 May 2016). Research shows preference for certain nonmedical traits over physical resemblance: Flores H, Lee J, Rodriguez-Purata J, Witkin G, Sandler B, Copperman AB. Beauty, brains or health: trends in ovum recipient preferences. *Journal of Women’s Health* 2014;23(10):830–3.
 74. American company Xytex Corp. recently received much media attention when it was revealed that an ex-convict was marketed as “genius donor”: Hauser C. Sperm donor’s profile hid mental illness and crime, lawsuits say. *The New York Times*, April 17, 2016. <http://www.nytimes.com/2016/04/18/world/americas/sperm-donors-profile-hid-mental-illness-and-crime-lawsuits-say.html> (last accessed 23 May 2016).
 75. See note 6, Davis 2010, at 175.
 76. See note 6, Davis 2010, at 37.
 77. Some maintain that high cognitive ability has intrinsic value, and even advocate a duty to cognitively enhance children. See Savulescu J,

- Sandberg A, Kahane G. Well-being and enhancement. In: Savulescu J, Ter Meulen R, Kahane G, eds. *Enhancing Human Capacities*. New York: Wiley-Blackwell; 2011:3–18.
78. We already have somewhat analogous situations; for example, training children for sport or music from a very young age.
79. Albeit with currently limited success: see note 2, Yong 2013.
80. Many of these studies are already available, see, for example, Freeman J. *Gifted Lives: What Happens when Gifted Children Grow Up*. Abingdon, UK: Routledge; 2013.
81. See note 3, Krutzinna 2016, at 532.
82. Some evidence can be drawn from longitudinal studies into gifted children and adults. See note 80, Freeman 2013.
83. See note 6, Davis 2010, at 168.
84. See note 15, Glover 2006, at 63–4.
85. See note 50, Sandel 2009, at 97.
86. See note 55, Chadwick 1998, at 195.
87. See note 6, Davis 2010, at 162.