THE SORTING SOCIETY

THE ETHICS OF GENETIC SCREENING AND THERAPY

EDITED BY

LOANE SKENE

JANNA THOMPSON

CAMBRIDGE

Medicine

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Reprogenetic technologies: balancing parental procreative autonomy and social equity and justice

Leslie Cannold

Introduction

In-vitro fertilization techniques and pre-implantation genetic diagnosis (PGD) currently allow parents to select an embryo for implantation in a woman's womb to avoid the resulting offspring suffering from, or being a carrier of, an inherited genetic disorder. In the future, it may be possible to screen and select embryos for non-disease genetic traits or predispositions. As well, some moral philosophers anticipate technologies that will enable parents to create embryos with a reduced susceptibility to disease as well as with valued non-disease characteristics such as height, intelligence, heterosexuality, impulse control, resistance to alcoholism, maternal behaviour, extraversion and athleticism, to name a few. In this chapter, I will refer to all such reproductive and genetic selection techniques as 'reprogenetic technologies'.

If science does deliver the knowledge necessary for parents to create embryos free from disease and with desired non-disease traits and predispositions,[1] questions arise as to whether parents would be morally obligated to use such technologies or, if no such obligations exist, whether it might still be morally permissible for them to choose to use them. Even if obligations can be founded or parental choice justified, we must ask whether society has good reason to encourage or allow untrammelled parents to use the technologies or whether some restrictions or even prohibitions may be justified.

To explore these questions, I will examine two claims. Firstly, the assertion that as long as such technologies are safe, parents are morally obligated to use them to create a child who, in the words of one reprogenetic advocate, has the 'best opportunity of the best life'.[2] Secondly, the weaker contention that while not obligated to use such technologies, parental choice to do so is morally

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permissible. Finally, I will consider the proper role of society in a world capable of developing reprogenetic technologies that enable parents to select or create offspring free of disease traits and with desired non-disease ones. Is society ever justified in restricting parents' freedom to use some or all of these technologies or in banning their use all together?

Those asserting a parental obligation to use reprogenetic technologies or the permissibility of parental choice to use them often put their case in terms of the value of such enhancements to resulting children. They also cite the entitlement of individuals and couples to procreative autonomy in defence of their position. They suggest, and I agree, that the fundamental importance of procreative autonomy places the burden on those who wish to constrain parental decision-making to offer substantial and pressing reasons for doing so, and to utilize the least restrictive tools available to achieve their ends.

However, despite the strength of claims from procreative autonomy, my analysis suggests there may be a number of substantial and pressing reasons for social interference in the freedom of parents to choose reprogenetic technologies. These reasons include the futility or socially negative consequences of parental decisions to create children with certain characteristics, the potential for use of the technologies to increase the disadvantages already experienced by environmentally impoverished children and the disproportionate and, in some cases, unjust burden an obligation, or even choice, to use the technologies places on women and other oppressed groups. In addition, society may be justified in interfering if the decisions some parents make to use the technologies changes the nature of the decisions facing others in ways that curtail the latter's freedom to say 'no' to use.

In the face of such concerns, I contend that parents are not obligated to use reprogenetic technologies and that society may be justified in imposing some limits on parental choice to use them. The challenge is to design a regulatory scheme that places the least possible limits on parental procreative freedom consistent with meaningfully reducing the harms that seem likely to result from unfettered parental choice.

Do parents have an obligation – or is it morally permissible for them – to use reprogenetic technologies to create the 'best' children?

Arguments in favour of parental obligation or choice regarding reprogenetic technologies include appeals to consistency, parental culpability for harm to children caused by failing to use the technologies and the overriding importance of parental procreative autonomy.[3]

Consistency

Appeals to consistency suggest that humans have always attempted to select the characteristics of their children through selection of their mates. Because reprogenetic technologies simply offer parents a more reliable means of producing offspring with the best chance of success, it is inconsistent to object to the latter but not the former. Says Savulescu:

> Selective mating has been occurring in humans ever since time began. Facial asymmetry can reflect genetic disorder. Smell can tell us whether our mate will produce the child with the best resistance to disease. We compete for partners in elaborate mating games and rituals of display which (sic) sort the best matches from the worst. As products of evolution, we select our mates, both rationally and instinctively, on the basis of their genetic fitness – their ability to survive and reproduce. Our (subconscious) goal is the success of our offspring. With the tools of genetics, we can select offspring in a more reliable way.[4]

However, even within a Darwinian schema, it is by no means clear that mate selection is driven by anything resembling the conscious, rational decision-making that would characterize the use of reprogenetic technologies to select the characteristics of offspring. Indeed, says anthropologist Sarah Hrdy, mate selection is only one component of natural selection: the component she calls the 'mindless' process that drives evolution:

> Darwin proposed that humans, along with every other kind of animal, evolved through a gradual, mindless, and unintentional process dubbed natural selection. Morally indifferent, natural selection culls and biases life chances with the unintended result that evolution (defined today as the change in gene frequencies over time) takes place.[5]

This analysis bolsters the logical assertion that even if humans have always selected their reproductive partners for the characteristics they believe will lead the two of them together to produce the most successful children, there is something qualitatively different about women or couples using reprogenetic technologies to directly select the characteristics of future offspring. Because what Savulescu calls selective mating and parental use of reprogenetic technologies are disanalogous, the moral obligatory/moral permissibility nature of one does not imply the moral obligatory/moral permissibility nature of the other.

It is also claimed that because parents are morally obliged to give their children every possible *environmental* advantage (i.e. education), it is inconsistent to suggest they are not similarly obligated to give they children every possible *genetic* advantage. Asks Harris:

> If we could engineer enhanced intelligence and health into the embryo should we not do so? If these are legitimate aims of education could they be illegitimate as the aims of medical, as opposed to educational, science?[6]

Agar makes a similar point in his quest to justify the permissibility of parental choice to use reprogenetic technologies:

> If we are permitted to produce certain traits by modifying our children's environments, then we are also permitted to produce them by modifying their genomes.[7]

While it is permissible for parents to make sacrifices in order to provide their children with the maximum number of environmental advantages, there is no generally recognized moral obligation to send one's children to private school, or to give them piano or tennis lessons. If children without such advantages fail to become concert pianists or to triumph at Wimbledon, parents are not construed as having harmed them. On this reading, while Agar may be right that it is permissible for parents to maximize their child's genetic advantages by using reprogenetic technology, Harris appears wrong to suggest a parental obligation to use the technology exists.

But does society have good reason to allow parents to choose? One potentially concerning implication of allowing parents' choice is that the aggregate consequences of such choice could profoundly alter the nature of the choice left to remaining parents. Intelligent children have relative advantages over their less intelligent peers. Suppose that so many parents choose to use the technologies to produce more intelligent children that kids with enhanced intelligence become the norm and unenhanced kids dunces. In such a world, parents who don't enhance their children may no longer be seen as making the permissible choice not to genetically alter their child, but as making the impermissible choice not to act to avoid disadvantaging their child in significant and foreseeable ways. Such parents could be accused, in other words, of violating what Feinberg called the child's right to 'an open future'.[8]

Insofar as non-use decisions are understood in this way, the choice by some parents to use the technologies could result in a situation where all parents effectively wind up with an obligation to use them. This state of affairs, where individual procreative autonomy is undermined rather than enhanced, is one liberal pluralist societies may have good reason to avoid.

Parental culpability for harm

Once technology provides us with the capacity to treat a condition or to affect an outcome over which previously we had no control, non-use metamorphoses into a decision for which we bear – and are seen to bear – responsibility.[9] Sometimes, because of counter-factual stipulations made by proponents of reprogenetic technologies that in the future we will know that reproductive technologies will be 'safe' or 'risk-free',[10] this observation appears as a claim that parents must either use the technologies, or be damned for the (presumed negative) consequences of non-use:

> Once technology affords us with the power to enhance our and our children's lives, to fail to do so will be to be responsible for the consequences. To fail to treat our

children's disease is to harm them . . . To fail to improve their physical, musical, psychological and other capacities is to harm them, just as it would be to harm them if we gave them a toxic substance that stunted or reduced these capacities.[11]

It is true that the availability of reprogenetic technologies presents parents with options that were previously unavailable, and responsibility for the nature and consequences of the decisions they make with regard to them. However, only if it does turn out to be the case that all the technologies will be known to be safe and effective, will it be true that their availability makes parental decisions not to use them culpable.

In fact, there seems little reason to assume that use of reprogenetic technologies will, in every instance, entail lower risks and greater benefits for the resulting child, other social groups or society as a whole. Few contemporary medical interventions are seen to offer such a favourable risk:benefit ratio to every child in every situation. Instead, parental decisions about reprogenetic technologies in the future are likely to mimic their medical decision-making in other areas today: consisting of an evaluation of the risks and benefits of use as against other available alternatives – including non-use – for all concerned.

Indeed, it seems likely that many parents will face considerable challenges in making what Harris describes as 'reasonable judgements as to the various probabilities involved'.[12] This is because in the early days, there is likely to be an absence of information about the risks and benefits of reprogenetic technologies, and this will pose difficulties for parents trying to weigh up their use against better-understood alternatives, including non-use. In such cases parents may, as Harris suggests, be right to 'err on the safe side' and – in so far as the widespread view that the 'safe side' is the inaction or preservation of the status quo – avoid using the technologies.[13]

The point here is simply that while the availability of reprogenetic technologies changes the nature of the reprogenetic choices facing parents, *this observation does not – on its own – support claims that parents have an* obligation to use the technologies. Indeed, in the early stages of availability, a lack of information about the costs and benefits associated with use may give parents good reason to avoid using the technologies.

Procreative autonomy

Autonomy is a concept of importance in Deontological, Consequential and Virtue ethical theories, among others. Autonomous agents are ones who freely direct and govern the course of their own life and whose capacities, beliefs and values are integral to him or her and are the source from which his or her actions spring. Autonomous agents largely determine their own ends and, as such, are recognized as having the dignity that moral agency bestows.[14]

Procreative autonomy reflects the view that choices about reproduction are essential to women's capacity to achieve social equality and central to the capacity of every individual to live what they understand to be a good life.

Reproduction is an intensely personal matter, and if, when and how we parent, and the sorts of children we bring into this world, reflect our identities and express our most fundamental values and beliefs. As the bearers and usual carers of children, procreative autonomy is a value of particular significance to women. This is why, all things being equal, it is considered wrong for societies – through act or omission – to limit the reproductive freedom of their citizens in general, and women in particular.[15] The central importance of autonomy is also reflected in contemporary medical law where patient autonomy is seen as the overriding consideration even when controversial uses of this freedom – like employing pre-implantation and prenatal diagnostic techniques to diagnose and terminate embryos/fetuses – are at issue.[16]

The compelling claims of procreative autonomy put the onus on those who wish to restrict an individual or couple's procreative autonomy to demonstrate substantial and pressing grounds for doing so. As well, they suggest that where such a case has been made, society ought to employ the least restrictive tools available to achieve stated ends. However, despite the high value society rightly places on procreative autonomy, my analysis suggests that there may be a number of substantial and pressing grounds for society to restrict choice to use the technologies, or ban them altogether.

Substantial and pressing grounds for interfering in parental *procreative autonomy*

A pointless race to the bottom

Some attributes that parents may wish to use reprogenetic technologies to achieve for their children offer only relative, rather than absolute, advantages. They are of benefit, in other words, only because some people have them and others don't. Height may be one such characteristic. In Australian society, the tallest accrue numerous advantages over the vertically challenged, including greater odds of marrying and of earning more money.[17] Tall athletes also have considerable advantages over shorter ones in some sports.

Yet, if all or most parents use reprogenetic technologies to have taller-than-average children (essentially the definition of 'tall'), there could be substantial costs to individuals and society. This is because average heights are likely to escalate rapidly, with the resulting 'height race' potentially leading to a population that may be too tall for its own good (back problems, for instance, may be more likely amongst the very tall) and too tall for existing facilities (ceiling heights in everything from public buildings to private houses to trams, buses and cars would need to be changed). As well, taller people are likely to be more toxic to the environment with their need for more food, larger cars and bigger houses.[18] These costs would come with no corresponding benefits

because whether we all end up at the same (increased) height, or with a similar bell-curve distribution of height as we currently have but with a 'taller' mean, the relative gain parents were seeking for their children by using the technologies would not be achieved.

Such consequences suggest the wrong-headedness of obligating parents to use the technologies to create children with attributes such as 'tallness', or even allowing them choice in the matter, given the high costs to such children and/or the human race.

Of course, height is a particular example, and in some cases parents could choose attributes that – even if the same choice by enough other parents cancels out the relative advantage for their child – could be neutral or even positive in terms of their impact on the human race. For instance, it's hard to see how a 'hand–eye coordination' race, or an intelligence one, would generate a similar set of physical and environmental problems for humans. Indeed, one could imagine that as a species, humans might benefit from being hyper-coordinated or super smart. However, parents would need to be informed that while they and their offspring were shouldering the risks and burdens of using the technologies, the benefits would accrue to society as a whole.

Increasing social disadvantage

One of the most potent objections facing those who contend that parents are obligated – or should be permitted – to use reprogenetic technologies to create the best child is the claim that unfettered parental access may increase social inequality.

Sociological research over many years has consistently found that as family incomes fall, there is a corresponding increase in the risks to children's health, behaviour, learning and socialization. Poverty, in other words, is the most significant risk factor children face in their struggle to achieve in life.[19]

The genetic lottery, however, allows the occasional counter-example.[20] It ensures, in other words, that every so often a child with outstanding innate musical, artistic, athletic or intellectual talent overcomes the disadvantage of poverty and succeeds in their chosen endeavour against the odds.

But what would be the fate of environmentally disadvantaged children in a world where parents are obligated or are free to choose to use reprogenetic technologies to create the best child? One option is that only wealthy parents would be able to act on this injunction or to exercise this 'choice'. In fact, even if reprogenetic services were covered by private health care, as many as 40 million Americans would be left out in the cold. If, as some predict, the technologies are not seen as insurable expenses, significantly more parents will be unable to afford them.[21]

In either case, the consequence of a user-pays approach to access would be that the children of an economically advantaged subset of the population

would not only benefit from the environmental advantages their parents' money can buy – music lessons, homes in neighbourhoods with better athletic facilities and schools – but also from a genetic edge. In such a world, the odds of a poor child deprived of both a genetic and environmental edge providing a counter-example to the enrichment = accomplishment norm would be remote.

One suggested remedy to this problem is that the State provides free tickets to the poor for a lottery in which the prize is a suite of genetic enhancement services similar to ones typically purchased by the wealthy.[22] Another is that the State subsidize reprogenetic services so everyone can afford them.[23]

Neither of these responses adequately responds to the justice concerns that generated them. Typically, lotteries generate few winners. A few poor children with a winning ticket for reprogenetic enhancement is not an adequate counter to the entrenchment of disadvantage among the poor that an untrammelled user-pays system is likely to yield. The second seems better, until we consider that in a world where everyone starts life with a winning genetic hand, the relative importance of the environment in determining life achievement will increase. That is, without the occasional equalizing impact of the genetic lottery, environmental inequalities will play an even greater role than is currently the case in determining a child's life chances. This suggests that unless societies funnelling resources into eliminating genetic inequality simultaneously attack the source of environmental inequality – a doubtful proposition – widespread parental use of reprogenetic technologies could *increase* the achievement gap between the children of the wealthy and those of the poor.

These significant justice-based concerns not only suggest that parents have no moral obligation to use the technologies, they cast doubt on claims that parental choice to use them is permissible.

Disproportionate and unjust burdens on women and other oppressed groups

If embryos are going to be selected or genetically enhanced, they must first be created in vitro. To do this, parents must undertake IVF procedures that impose considerable physical burdens on women. These include serial blood tests, ultrasound examinations and surgical procedures to retrieve oocytes.[24] As well, hyper-stimulating the ovaries to produce multiple eggs increases women's risk of certain types of hormone-dependent cancers, while the costs of ovarian hyper-stimulation syndrome (OHSS) in its severe form may cause renal impairment, liver dysfunction, thromboembolic phenomena, shock and even death.[25] These medical facts suggest that there will be costs to women of complying with a moral obligation to use the technologies that do not apply to men.

It is estimated that two in every five pregnancies worldwide are unplanned though not all of these will be unwanted.[26] A moral obligation for parents to use reprogenetic technologies to enhance their children's lives would present women who discover themselves pregnant with an unplanned, but not unwanted, child with a conflict between their moral obligation to any child of theirs to use reprogenetic technologies prior to implantation to create the best child, and their obligations to the particular embryo/fetus already conceived. Another way of describing this conflict is as one between women's obligation to any child of theirs to use reprogenetic technologies to create the best child and their moral beliefs about abortion.

For Harris this potential conflict can be solved by 'people' – by which he clearly means women – avoiding unplanned pregnancy in the first place by being more 'circumspect' and less 'rebellious':

> There is a deeply ingrained rebelliousness in human beings which coupled with a love of spontaneity and freshness is always likely to undermine moral imperatives that require the radical circumspection which would enable people to avail themselves of genetic protections for their children . . . Even now there is some rebellion against the moral imperatives created by our knowledge of how habits, diet, in short lifestyle, affect the course of a pregnancy. Already people resent strictures to abstain from smoking, alcohol, drugs, and other things known adversely to affect the developing human individual. Inevitably, even if genetic modification of their children is available to them, many will see the circumspection required for such protection of their children to be not only burdensome, but too great a sacrifice of other values [like] . . . reckless humanity . . .[27]

However, according to the World Health Organization (WHO), neither 'rebelliousness', a 'love of "spontaneity" nor reckless humanity' are major causes of unplanned pregnancy. Instead, the main causes include women's/couples' lack of access to contraception and/or information about how to use it properly, violence against women and high rates of contraceptive failure. Indeed, the WHO says that even if all contraceptive users used methods perfectly every time, there would be nearly six million accidental pregnancies annually.[28]

This suggests that no matter how deliberate, circumspect and compliant their reproductive behaviour, women will continue to experience unplanned pregnancies, not all of which will be unwanted. This means that in a world where parents are morally obligated to use reprogenetic technologies, some women will face an acute moral conflict between their parental responsibilities to any future child and their responsibilities to a particular conceived embryo/fetus.[29]

While the presence of such a conflict does not defeat claims for a moral obligation to use the technologies, it does complicate it more than advocates of such an obligation acknowledge. As de Martin-Melo notes, while the assignment of a moral obligation that disproportionately burdens women or

another social group may be permissible, some justification for this unequal burden must be offered, not to mention some discussion of how women ought to resolve conflicts between competing moral responsibilities to present and future children. In the absence of such a justification and discussion, I would agree with her that the claim for a parental obligation to use reprogenetic technologies to create the best children must be 'serious[ly] question[ed]'.[30]

Women are not the only oppressed group that could be adversely affected by a parental obligation, or option, to use reprogenetic technologies. Indigenous Australians suffer disadvantage relative to the non-indigenous majority in the enjoyment of economic, social and cultural rights, particularly in the field of employment, housing, health and education.[31] Similarly, African Americans are disadvantaged relative to Whites on economic, educational, employment and other social measures.[32]

These sad facts raise the question: if science provides the tools to determine an embryo's skin colour, would dark-skinned parents (say of Aboriginal Australian or Black African extraction) living as minorities in White, racist societies be obligated to use such technologies to create a light-skinned child?

Those who argue that parents have a moral responsibility to act on relevant, available genetic information to create the child with the best chance of the best life seem committed to saying 'yes.' Yet, good arguments exist about the justice of Black parents undertaking the burdens of creating a child using reprogenetic technologies to overcome social discrimination that could be overcome by pursuing social change. Discrimination against Aboriginal Australians and Black Americans is widely acknowledged to be unjust, as well as a problem of which they are the victim, not the author. Yet, the reprogenetics 'solution' requires parents to bear the costs associated with its amelioration. These costs include fiscal costs and physical costs that, as already noted, will be disproportionately borne by Black women. As well, such parents may find the process of choosing against Black skin colour in their offspring demeaning and self-abnegating, as it arguably requires them to reject for others a genetic attribute that may be constitutive of their own sense of self and identity.

Even if use of the technologies is construed as a choice, the consequences remain troubling. If some Black parents who can afford the technology seek access to it, the likely aggregate consequences of such individual choices may – in a few generations – be a reduction in the number of Aboriginal Australians and Black Americans. It will be the children of Aboriginal and Black American parents who can't afford the technology or who choose not to use it who will appear Black with the same frequency as is currently the case. However, the use of the technologies by some Black parents will mean that children of non-users will be pursing achievement in a society in which shrinking numbers of people are Black. In this society, fewer people will be

negatively affected by racism, a situation that could reasonably be expected to reduce the number of those motivated to fight for its elimination.

This suggests that use by some Black parents of reprogenetic technology to select a White child could reduce the resources available to the Black children who remain to combat the racism that led to the need for the reprogenetic solution in the first place: an outcome that could see racist incidents rise. This could cause another previously discussed problem: the creation of an effective obligation on all parents to use the technology to avoid violating their child's right to an open future.

Reprogenetic technologies: can access be both free and fair?

As I have tried to show, obligating or even allowing parents to choose to use reprogenetic technologies to have the 'best' children can result in a range of surprising, harmful and unjust consequences. These include undermining the freedom of parents to choose not to use the technologies, burdening the environment, women and other minorities and further eroding the life chances of the poor. The substantial and pressing nature of such consequences suggest that societies may be justified in regulating parental access to and use of the technologies.

Regulation need not be prohibitionist in intent or consequence, but can be procedural, enabling rather than restrictive, and can operate in ways that represent widespread moral agreement.[33] An ideal regulatory approach would be one able to maximize the procreative freedom of individuals and couples consistent with fostering the wellbeing of women, the resulting child, the human race and the environment, and ensuring equality and justice for socially disadvantaged groups.

Ensuring that women and couples are properly informed about the costs and expected benefits for all involved through the provision of professional, non-directive information and counselling services will ensure women and couples are making a substantially informed and voluntary decision to use the technologies. This could reduce the risk of parents making futile choices, or ones that damage the human race collectively, or harm the environment.

However, professional non-directive counselling is unlikely to discourage all or even most parents from making decisions to create children without socially disabling traits, because as long as it is true that able-bodied White male children enjoy an advantage in our society, parents have good reason to give their informed and voluntary consent to use of the technologies to create children with these characteristics. Similarly, in a context where only the wealthy can afford to use the technologies to create the best offspring, the relative advantages for reprogenetically enhanced children over those unable to afford a genetic edge will be real. Parents who can afford the technologies

may legitimately feel that a failure to use them to create the best child will render them guilty of violating their child's right to an open future. Whether informing parents of the social inequities that could result from the aggregate consequences of their individual choices would – or even should – change their minds is unclear.

Issues of just allocation of limited resources lie at the heart of many of the concerns about unfettered parental choice about reprogenetic technologies. Is it right that individuals who suffer disadvantages flowing from unjust social conditions beyond their individual control (like racism) should fund (perhaps at the expense of their dignity and self-esteem) the cost of their children's emancipation? Is it just that societies that deliberately create the market conditions that lead to disparities of wealth stand by – or even assist – citizens to access expensive technologies expected to increase these disparities and the inequality of opportunity they produce? The only moral answer to both these questions seems to be 'no'.

What this suggests is that an appropriate regulatory response would focus as much on a right to procreative autonomy as the social and material conditions in which individuals and couples make choices. As Petchesky notes:

> [Individuals] make their own reproductive choices, but they do not make them just as they please; they do not make them under conditions they create but under conditions and constraints they, as mere individuals, are powerless to change. That individuals do not determine the social framework in which they act does not nullify their choices, or their moral capacity to make them. It only suggests that we have to focus less on 'choice' and more on how to transform the social conditions of choosing, working and reproducing.[34]

As we have seen, parents may have good reason to use reprogenetic technologies to create children with characteristics that do not always and unavoidably impede a child's opportunities for a good life, but only do so in particular and remedial social contexts i.e. Black parents choosing White children. Blackness is not an intrinsic barrier to the 'best life', but one only in societies that are racist. Societies that create barriers to achievement that give parents good reason to use reproductive technologies may be understood to have dual obligations. On the one hand, such societies are obliged to give parents – and even assist them to exercise – the freedom to respond to that society by creating offspring best placed to have the best life. On the other hand, such societies are obligated to remedy the economic, cultural, social and/or political circumstances that render particular characteristics – like Black skin – a barrier to achievement. It would seem appropriate to me that the attitudinal and concrete support societies provide for citizens to exercise reproductive choice should match – on a 1:1 basis – the attention they give to the environmental conditions unjustly constraining those choices. This means that at the same time as society is respecting the procreative autonomy of its

citizens, it is working to modify the conditions that constrain their choices in unjust ways.

The randomness of the genetic lottery advantages those on the pointy end of the environmental one. Its elimination further benefits those whose wealth – because of the environmental advantages it purchases – already enjoy a lead in the competitive race for achievement. Neither making reprogenetic technologies available through a lottery nor providing universal access to the technologies through whole-scale subsidies to the poor redresses these problems.

The answer may be to require the technologies to be distributed randomly. In Australia, for instance, those with private health insurance can purchase health care superior to the public provision used largely by the poor. However, both rich and poor must queue for the crisis care provided by hospital emergency departments, which is allocated solely on the basis of medical need. This situation ensures on-going interest amongst the wealthy for the state of the public hospital system as they may be among those patients arriving in casualty wanting top quality medical care.

Perhaps capacity to pay should also be removed as a criterion for access to reprogenetic services. While need is a slippery concept in relation to these technologies, lotteries in which the entire population participate to gain access to these services would ensure their benefits and harms were fairly distributed among all members of society. At the same time, societies adopting this approach should match their dedication to remedying the impact of the genetic lottery with a commitment to ameliorating the impact of the environmental one on a 1:1 basis: a commitment the population is likely to support as long as its members are unsure when they will gain access to the promised genetic benefits offered by the technologies. Thus, at the same time as societies expend effort to ameliorate the effects of a lottery that largely damages the life chances of the privileged, equivalent efforts are made to counter the negative impact of the one that – by definition – wreaks havoc with the life chances of the underprivileged.

NOTES AND REFERENCES

1. Dr Leanda Wilton, head of Genetic and Molecular Research Laboratory at Melbourne IVF, contends that the technological know-how to test for a multiple non-disease gene – and to safely modify those genes to produce desired outcomes – is around the corner. She says that developing such a capacity will be enormously expensive and extremely time-consuming and, as far as she knows, is not currently being pursued (L. Wilton, personal communication (2004)). At a forum in Melbourne Australia in 2005 on Genetic Selection, Dr Dianna Devore of the Australian Stem Cell Centre voiced a similar view.

2. J. Savulescu, 'New breed of humans: the moral obligation to enhance' (2005) 1(1) *Ethics, Law and Moral Philosophy of Reproductive Biomedicine* 38.
3. J. Harris, *Clones, Genes and Immortality: Ethics and the Genetic Revolution* (Oxford; New York: Oxford University Press, 1998); J. Harris and S. Holm (eds.), *The Future of Human Reproduction: Ethics, Choice and Regulation. Issues in Biomedical Ethics* (Oxford: Clarendon, 1998); J. Savulescu, 'Procreative beneficence: why we should select the best children' (2001) 15(5/6) *Bioethics* 413–26; J. Savulescu, 'New breed of humans: the moral obligation to enhance', note 2 above, 36–9; N. Agar, *Liberal Eugenics: In Defence of Human Enhancement* (Oxford: Blackwell Publishing, 2004); P. Singer, *Shopping at the Genetic Supermarket* (undated) www.petersingerlinks.com/supermarketprint.htm (accessed 3 February 2004).
4. J. Savulescu, 'Genetic interventions and the ethics of enhancement' in B. Steinbock (ed.), *The Oxford Handbook on Bioethics* (Oxford: Oxford University Press, forthcoming).
5. S. B. Hrdy, *Mother Nature: National Selection and the Female of the Species* (London: Chatto & Windus, 1999) 126.
6. J. Harris, *Clones, Genes and Immortality: Ethics and the Genetic Revolution*, note 3 above, 173.
7. N. Agar, *Liberal Eugenics: In Defence of Human Enhancement*, note 3 above, 113.
8. Feinberg first posited a child's right to an open future (J. Feinberg, 'The child's right to an open future' in W. Aiken and H. L. Follette (eds.) *Whose Child? Children's Rights, Parental Authority and State Power* (Totowa, New Jersey: Rowman and Littlefield,1980)). My use of it here as a negative claim right that generates a correlative duty not to behave in any way that violates the child's capacity to have an open future. See: M. Lotz, 'Feinberg, Mills and the child's right to an open future' (2006) 37(4) *Journal of Social Philosophy* 537–51.
9. P. Lauritzen, 'Experience as truth? Feminist ethics, experience and reproductive technology' (1991) 11(1) *Bioethics News* 8–18.
10. J. Harris, *Clones, Genes and Immortality: Ethics and the Genetic Revolution*, note 6 above, 222; J. Savulescu, 'New breed of humans: the moral obligation to enhance', note 2 above, 38.
11. J. Savulescu, 'New breed of humans: the moral obligation to enhance', note 2 above, 38.
12. J. Harris, *Clones, Genes and Immortality: Ethics and the Genetic Revolution* note 6 above, 214.
13. *Ibid.*
14. R. Young, *Personal Autonomy: Beyond Negative and Positive Liberty* (London; Sydney: Croom Helm, 1986).
15. L. Cannold, *What, No Baby? Why Women are Losing the Freedom to Mother, and How They Can Get it Back* (Fremantle: Fremantle Arts Centre Press, 2005).
16. B. Bennett, 'Choosing a child's future? Reproductive decision-making and preimplantation genetic diagnosis' in J. Gunning and H. Szoke (eds.), *The Regulation of Assisted Reproductive Technology* (Hampshire, Burlington: Ashgate, 2003).
17. Every additional centimetre of height added $485AUD to an annual pay packet ('NumbersCrunch' Good Weekend, *The Age*, 7 February 2004, 12.).

18. P. Singer, *Shopping at the Genetic Supermarket*, note 3 above.
19. G. Duncan, W. Yeung, J. Brooks-Gunn, J. R. Smith, 'How much does childhood poverty affect the life chances of children' (1998) 63 (June) *American Sociological Review* 406–23.
20. I am indebted to Neil Levy for my characterization of this point.
21. M. Mehlman and J. Botkin, *Access to the Genome: The Challenge to Equality* (Georgetown: Georgetown University Press, 1998) 88.
22. *Ibid.*, Chapter 6.
23. P. Singer, *Shopping at the Genetic Supermarket*, note 3 above.
24. I. de Melo-Martin, 'Discussion. On our obligation to select the best children: a reply to Savulescu' (2004) 18(1) *Bioethics* 75.
25. *Ibid.*, 76.
26. World Health Organization, *Unsafe Abortion: Global and Regional Estimates of the Incidence of Unsafe Abortion and Associated Mortality in 2000* (Geneva: World Health Organization, 2004).
27. J. Harris, 'Rights and reproductive choice' in J. Harris and S. Holm (eds.), *The Future of Human Reproduction: Ethics, Choice and Regulation. Issues in Biomedical Ethics* (Oxford: Clarendon, 1998) 239–40.
28. World Health Organization, *Safe Abortion: Technical and Policy Guidance for Health Systems* (Geneva: World Health Organization, 2003) 12.
29. For a sustained discussion of the obligations women feel to particular conceived could-be children see L. Cannold, *What, No Baby? Why Women are Losing the Freedom to Mother, and How They Can Get it Back*, note 15 above.
30. I. de Melo-Martin, 'Discussion. On our obligation to select the best children: a reply to Savulescu', note 24 above, 72–83.
31. Aboriginal & Torres Straight Islander Social Justice Commissioner,(2002) *Social Justice Report.* www.hreoc.gov.au/social_justice/sjreport_02/chapter4.html#4.1.1.1 at 6 March 2006.
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33. L. Cannold and L. Gillam, 'A new consultation management process for managing divergent community views: lesbian and single women's access to artificial insemination and ARTs' in J. Gunning and H. Szoke (eds.), *The Regulation of Assisted Reproductive Technology* (Hampshire, Burlington: Ashgate, 2003) 206.
34. R. P. Petchesky, *Abortion and Woman's Choice: The State, Sexuality and Reproductive Freedom* (Boston: Northeastern University Press, 1985) 11.