

PROCREATIVE BENEFICENCE: WHY WE SHOULD SELECT THE BEST CHILDREN

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ABSTRACT

Eugenic selection of embryos is now possible by employing in vitro fertilization (IVF) and preimplantation genetic diagnosis (PGD). While PGD is currently being employed for the purposes of detecting chromosomal abnormalities or inherited genetic abnormalities, it could in principle be used to test any genetic trait such as hair colour or eye colour.

Genetic research is rapidly progressing into the genetic basis of complex traits like intelligence and a gene has been identified for criminal behaviour in one family. Once the decision to have IVF is made, PGD has few 'costs' to couples, and people would be more inclined to use it to select less serious medical traits, such as a lower risk of developing Alzheimer Disease, or even for non-medical traits. PGD has already been used to select embryos of a desired gender in the absence of any history of sex-linked genetic disease.

I will argue that: (1) some non-disease genes affect the likelihood of us leading the best life; (2) we have a reason to use information which is available about such genes in our reproductive decision-making; (3) couples should select embryos or fetuses which are most likely to have the best life, based on available genetic information, including information about non-disease genes. I will also argue that we should allow selection for non-disease genes even if this maintains or increases social inequality. I will focus on genes for intelligence and sex selection.

I will defend a principle which I call Procreative Beneficence: couples (or single reproducers) should select the child, of the possible children they could have, who is expected to have the best life, or at least as good a life as the others, based on the relevant, available information.

INTRODUCTION

Imagine you are having in vitro fertilisation (IVF) and you produce four embryos. One is to be implanted. You are told that there is a genetic test for predisposition to scoring well on IQ tests (let's call this intelligence). If an embryo has gene subtypes (alleles) A, B there is a greater than 50% chance it will score more than 140 if given an ordinary education and upbringing. If it has subtypes C, D there is a much lower chance it will score over 140. Would you test the four embryos for these gene subtypes and use this information in selecting which embryo to implant?

Many people believe intelligence is a purely social construct and so it is unlikely to have a significant genetic cause. Others believe there are different sorts of intelligence, such as verbal intelligence, mathematical intelligence, musical ability and no such thing as general intelligence. Time will tell. There are several genetic research programs currently in place which seek to elucidate the genetic contribution to intelligence. This paper pertains to any results of this research even if it only describes a weak probabilistic relation between genes and intelligence, or a particular kind of intelligence.

Many people believe that research into the genetic contribution to intelligence should not be performed, and that if genetic tests which predict intelligence, or a range of intelligence, are ever developed, they should not be employed in reproductive decision-making. I will argue that we have a moral obligation to test for genetic contribution to non-disease states such as intelligence and to use this information in reproductive decision-making.

Imagine now you are invited to play the Wheel of Fortune. A giant wheel exists with marks on it from 0–\$1,000,000, in \$100 increments. The wheel is spun in a secret room. It stops randomly on an amount. That amount is put into Box A. The wheel is spun again. The amount which comes up is put into Box B. You can choose Box A or B. You are also told that, in addition to the sum already put in the boxes, if you choose B, a dice will be thrown and you will lose \$100 if it comes up 6.

Which box should you choose?

The rational answer is Box A. Choosing genes for non-disease states is like playing the Wheel of Fortune. You should use all the available information and choose the option most likely to bring about the best outcome.

PROCREATIVE BENEFICENCE : THE MORAL OBLIGATION TO HAVE THE BEST CHILDREN

I will argue for a principle which I call Procreative Beneficence:

couples (or single reproducers) should select the child, of the possible children they could have, who is expected to have the best life, or at least as good a life as the others, based on the relevant, available information.

I will argue that Procreative Beneficence implies couples should employ genetic tests for non-disease traits in selecting which child to bring into existence and that we should allow selection for non-disease genes in some cases even if this maintains or increases social inequality.

By 'should' in 'should choose', I mean 'have good reason to.' I will understand morality to require us to do what we have most reason to do. In the absence of some other reason for action, a person who has good reason to have the best child is morally required to have the best child.

Consider the following three situations involving normative judgements.

- (1) 'You are 31. You will be at a higher risk of infertility and having a child with an abnormality if you delay child-bearing. But that has to be balanced against taking time out of your career now. That's only something you can weigh up.'
- (2) 'You should stop smoking.'
- (3) 'You must inform your partner that you are HIV positive or practise safe sex.'

The 'should' in 'should choose the best child' is that present in the second example. It implies that persuasion is justified, but not coercion, which would be justified in the third case. Yet the situation is different to the more morally neutral (1).

Definitions

A disease gene is a gene which causes a genetic disorder (e.g. cystic fibrosis) or predisposes to the development of disease (e.g. the genetic contribution to cancer or dementia). A non-disease gene is a gene which causes or predisposes to some physical or psychological state of the person which is not itself a disease state, e.g. height, intelligence, character (not in the sub-normal range).

Selection

It is currently possible to select from a range of possible children we could have. This is most frequently done by employing fetal selection through prenatal testing and termination of pregnancy. Selection of embryos is now possible by employing in vitro fertilization and preimplantation genetic diagnosis (PGD). There are currently no genetic tests available for non-disease states except sex. However, if such tests become available in the future, both PGD and prenatal testing could be used to select offspring on the basis of non-disease genes. Selection of sex by PGD is now undertaken in Sydney, Australia.¹ PGD will also lower the threshold for couples to engage in selection since it has fewer psychological sequelae than prenatal testing and abortion.

In the future, it may be possible to select gametes according to their genetic characteristics. This is currently possible for sex, where methods have been developed to sort X and Y bearing sperm.²

Behavioural Genetics

Behavioural Genetics is a branch of genetics which seeks to understand the contribution of genes to complex behaviour. The scope of behavioural genetics is illustrated in Table 1.

AN ARGUMENT FOR PROCREATIVE BENEFICENCE

Consider the *Simple Case of Selection for Disease Genes*. A couple is having IVF in an attempt to have a child. It produces two embryos. A battery of tests for common diseases is performed. Embryo A has no abnormalities on the tests performed. Embryo B has no abnormalities on the tests performed except its genetic profile reveals it has a predisposition to developing asthma. Which embryo should be implanted?

Embryo B has nothing to be said in its favour over A and something against it. Embryo A should (on pain of irrationality) be implanted. This is like choosing Box A in the Wheel of Fortune analogy.

¹ J. Savulescu. Sex Selection – the case for. *Medical Journal of Australia* 1999; 171: 373–5.

² E.F. Fugger, S.H. Black, K. Keyvanfar, J.D. Schulman. Births of normal daughters after Microsort sperm separation and intrauterine insemination, in vitro fertilization, or intracytoplasmic sperm injection. *Hum Reprod* 1998; 13: 2367–70.

Table 1: Behavioural Genetics

Aggression and criminal behaviour
Alcoholism
Anxiety and Anxiety disorders
Attention Deficit Hyperactivity Disorder (ADHD)
Antisocial personality disorder
Bipolar disorder
Homosexuality
Maternal Behaviour
Memory and intelligence
Neuroticism
Novelty Seeking
Schizophrenia
Substance Addiction

Why shouldn't we select the embryo with a predisposition to asthma? What is relevant about asthma is that it reduces quality of life. Attacks cause severe breathlessness and in extreme cases, death. Steroids may be required to treat it. These are among the most dangerous drugs which exist if taken long term. Asthma can be lifelong and require lifelong drug treatment. Ultimately it can leave the sufferer wheel chair bound with chronic obstructive airways disease. The morally relevant property of 'asthma' is that it is a state which reduces the well-being a person experiences.

Parfitian defence of voluntary procreative beneficence in the Simple Case

The following example, after Parfit,³ supports Procreative Beneficence. A woman has rubella. If she conceives now, she will have a blind and deaf child. If she waits three months, she will conceive another different but healthy child. She should choose to wait until her rubella is passed.

Or consider the Nuclear Accident. A poor country does not have enough power to provide power to its citizens during an extremely cold winter. The government decides to open an old and unsafe nuclear reactor. Ample light and heating are then available. Citizens stay up later, and enjoy their lives much more. Several months later, the nuclear reactor melts down and large amounts of radiation are released into the environment. The

³ D. Parfit. 1976. Rights, Interests and Possible People, in *Moral Problems in Medicine*, S. Gorovitz, et al, eds. Englewood Cliffs. Prentice Hall. D. Parfit. 1984. *Reasons and Persons*. Oxford. Clarendon Press: Part IV.

only effect is that a large number of children are subsequently born with predispositions to early childhood malignancy.

The supply of heating and light has changed the lifestyle of this population. As a result of this change in lifestyle, people have conceived children at different times than they would have if there had been no heat or light, and their parents went to bed earlier. Thus, the children born after the nuclear accident would not have existed if the government had not switched to nuclear power. They have not been harmed by the switch to nuclear power and the subsequent accident (unless their lives are so bad they are worse than death). If we object to the Nuclear Accident (which most of us would), then we must appeal to some form of harmless wrong-doing. That is, we must claim that a wrong was done, but no one was harmed. We must appeal to something like the Principle of Procreative Beneficence.

An Objection to Procreative Beneficence in the Simple Case

The following objection to Procreative Beneficence is common.

‘If you choose Embryo A (without a predisposition to asthma), you could be discarding someone like Mozart or an olympic swimmer. So there is no good reason to select A.’

It is true that by choosing A, you could be discarding a person like Mozart. But it is equally true that if you choose B, you could be discarding someone like Mozart without asthma. A and B are equally likely (on the information available) to be someone like Mozart (and B is more likely to have asthma).

Other Principles of Reproductive Decision-Making Applied to the Simple Case

The principle of Procreative Beneficence supports selecting the embryo without the genetic predisposition to asthma. That seems intuitively correct. How do other principles of reproductive decision-making apply to this example?

1. *Procreative Autonomy*: This principle claims that couples should be free to decide when and how to procreate, and what kind of children to have.⁴ If this were the only decision-

⁴R. Dworkin. 1993. *Life's Dominion: An Argument about Abortion and Euthanasia*. London. Harper Collins; J. Harris. Goodbye Dolly? The ethics of human cloning. *Journal of Medical Ethics* 1997; 23: 353–60; J. Harris. 1998. Rights and Reproductive Choice, in *The Future of Reproduction*, J. Harris and S.

guiding principle, it would imply couples might have reason to choose the embryo with a predisposition to asthma, if for some reason they wanted that.

2. *Principle of Non-Directive Counselling*: According to this principle, doctors and genetic counsellors should only provide information about risk and options available to reduce that risk.⁵ They should not give advice or other direction. Thus, if a couple wanted to transfer Embryo B, and they knew that it would have a predisposition to asthma, nothing more is to be said according to Non-Directive Counselling.
3. *The 'Best Interests of the Child' Principle*: Legislation in Australia and the United Kingdom related to reproduction gives great weight to consideration of the best interests of the child. For example, the Victorian Infertility Treatment Act 1995 states '*the welfare and interests of any person born or to be born as a result of a treatment procedure are paramount.*'⁶ This principle is irrelevant to this choice. The couple could choose the embryo with the predisposition to asthma and still be doing everything possible in the interests of *that* child.

None of the alternative principles give appropriate direction in the Simple Case.

MOVING FROM DISEASE GENES TO NON-DISEASE GENES: WHAT IS THE 'BEST LIFE'?

It is not asthma (or disease) which is important, but its impact on a life in ways that matter which is important. People often trade length of life for non-health related well-being. Non-disease genes may prevent us from leading the best life.

By 'best life', I will understand the life with the most well-being. There are various theories of well-being: hedonistic, desire-fulfilment, objective list theories.⁷ According to hedonistic theories, what matters is the quality of our experiences, for

Holm, eds. Oxford. Clarendon Press; J.A. Robertson. 1994. *Children of Choice: Freedom and the New Reproductive Technologies*. Princeton. Princeton University Press; C. Strong. 1997. *Ethics in reproductive and perinatal medicine*. New Haven. Yale University Press.

⁵ J.A.F. Roberts. 1959. *An introduction to human genetics*. Oxford. OUP.

⁶ The *Human Fertilization and Embryology Act 1990* in England requires that account be taken of the welfare of any child who will be born by assisted reproduction before issuing a licence for assistance (S.13(5)).

⁷ Parfit, *op. cit.*, Appendix I, pp. 493–502; Griffin. 1986. *Well-Being*. Oxford. Clarendon Press.

example, that we experience pleasure. According to desire-fulfilment theories, what matters is the degree to which our desires are satisfied. According to objective list theories, certain activities are good for people, such as achieving worthwhile things with your life, having dignity, having children and raising them, gaining knowledge of the world, developing one's talents, appreciating beautiful things, and so on.

On any of these theories, some non-disease genes will affect the likelihood that we will lead the best life. Imagine there is a gene which contributes significantly to a violent, explosive, uncontrollable temper, and that state causes people significant suffering. Violent outbursts lead a person to come in conflict with the law and fall out of important social relations. The loss of independence, dignity and important social relations are bad on any of the three accounts.

Buchanan et al. argue that what is important in a liberal democracy is providing people with general purpose means, i.e. those useful to any plan of life.⁸ In this way we can allow people to form and act on their own conception of the good life. Examples of general purpose means are the ability to hear and see. But similarly the ability to concentrate, to engage with and be empathetic towards other human beings may be all purpose means. To the degree that genes contribute to these, we have reason to select those genes.

Consider another example. Memory (M) is the ability to remember important things when you want to. Imagine there is some genetic contribution to M: Six alleles (genes) contribute to M. IVF produces four embryos. Should we test for M profiles?

Does M relate to well-being? Having to go to the supermarket twice because you forgot the baby formula prevents you doing more worthwhile things. Failing to remember can have disastrous consequences. Indeed, forgetting the compass on a long bush walk can be fatal. There is, then, a positive obligation to test for M and select the embryo (other things being equal) with the best M profile.

Does being intelligent mean one is more likely to have a better life? At a folk intuitive level, it seems plausible that intelligence would promote well-being on any plausible account of well-being.

⁸ A. Buchanan, D.W. Brock, N. Daniels, D. Wikler. 2000. *From Chance to Choice*. Cambridge. CUP: 167. Buchanan and colleagues argue in a parallel way for the permissibility of genetic manipulation (enhancement) to allow children to live the best life possible (Chapter Five). They do not consider selection in this context.

On a hedonistic account, the capacity to imagine alternative pleasures and remember the salient features of past experiences is important in choosing the best life. On a desire-fulfilment theory, intelligence is important to choosing means which will best satisfy one's ends. On an objective list account, intelligence would be important to gaining knowledge of the world, and developing rich social relations. Newson has reviewed the empirical literature relating intelligence to quality of life. Her synthesis of the empirical literature is that 'intelligence has a high instrumental value for persons in giving them a large amount of complexity with which to approach their everyday lives, and that it equips them with a tool which can lead to the provision of many other personal and social goods.'⁹

Socrates, in Plato's *Philebus*, concludes that the best life is a mixture of wisdom and pleasure. Wisdom includes thought, intelligence, knowledge and memory.¹⁰ Intelligence is clearly a part of Plato's conception of the good life:

without the power of calculation you could not even calculate that you will get enjoyment in the future; your life would be that not of a man, but of a sea-lung or one of those marine creatures whose bodies are confined by a shell.¹¹

Choice of Means of Selecting

This argument extends in principle to selection of fetuses using prenatal testing and termination of affected pregnancy. However, selection by abortion has greater psychological harms than selection by PGD and these need to be considered. Gametic selection, if it is ever possible, will have the lowest psychological cost.

Objections to the Principle of Procreative Beneficence Applied to Non-Disease Genes

1. *Harm to the child:* One common objection to genetic selection for non-disease traits is that it results in harm to the child. There are various versions of this objection, which include the harm

⁹ A. Newson. The value of intelligence and its implications for genetic research. *Fifth World Congress of Bioethics*, Imperial College, London, 21–24 September 2000.

¹⁰ *Philebus* 21 C 1–12. A.E. Taylor's translation. 1972. Folkstone. Dawsons of Pall Mall: 21 D 11–3, E 1–3.

¹¹ *Philebus* 21 C 1–12.

which arises from excessive and overbearing parental expectations, using the child as a means, and not treating it as an end, and closing off possible future options on the basis of the information provided (failing to respect the child's 'right to an open future').

There are a number of responses. Firstly, in some cases, it is possible to deny that the harms will be significant. Parents come to love the child whom they have (even a child with a serious disability). Moreover, some have argued that counselling can reduce excessive expectations.¹²

Secondly, we can accept some risk of a child experiencing some state of reduced well-being in cases of selection. One variant of the harm to child objection is: 'If you select embryo A, it might still get asthma, or worse, cancer, or have a much worse life than B, and you would be responsible.' Yet selection is immune to this objection (in a way which genetic manipulation is not).

Imagine you select Embryo A and it develops cancer (or severe asthma) in later life. You have not harmed A unless A's life is not worth living (hardly plausible) because A would not have existed if you had acted otherwise. A is not made worse off than A would otherwise have been, since without the selection, A would not have existed. Thus we can accept the possibility of a bad outcome, but not the probability of a very bad outcome. (Clearly, Procreative Beneficence demands that we not choose a child with a low predisposition to asthma but who is likely to have a high predisposition to cancer.)

This is different to genetic manipulation. Imagine you perform gene therapy to correct a predisposition to asthma and you cause a mutation which results in cancer later in life. You have harmed A: A is worse off in virtue of the genetic manipulation than A would have been if the manipulation had not been performed (assuming cancer is worse than asthma).

There is, then, an important distinction between:

- interventions which are genetic manipulations of a single gamete, embryo or fetus
- selection procedures (e.g. sex selection) which select from among a range of different gametes, embryos and fetuses.

2. *Inequality*: One objection to Procreative Beneficence is that it will maintain or increase inequality. For example, it is often argued that selection for sex, intelligence, favourable physical or

¹² J. Robertson. Preconception Sex Selection. *American Journal of Bioethics* 1:1 (Winter 2001).

psychological traits, etc. all contribute to inequality in society, and this is a reason not to attempt to select the best.

In the case of selection against disease genes, similar claims are made. For example, one version of the *Disability Discrimination Claim* maintains that prenatal testing for disabilities such as Down syndrome results in discrimination against those with those disabilities both by:

- the statement it makes about the worth of such lives
- the reduction in the numbers of people with this condition.

Even if the Disability Discrimination Claim were true, it would be a drastic step in favour of equality to inflict a higher risk of having a child with a disability on a couple (who do not want a child with a disability) to promote social equality.

Consider a hypothetical rubella epidemic. A rubella epidemic hits an isolated population. Embryos produced prior to the epidemic are not at an elevated risk of any abnormality but those produced during the epidemic are at an increased risk of deafness and blindness. Doctors should encourage women to use embryos which they have produced prior to the epidemic in preference to ones produced during the epidemic. The reason is that it is bad that blind and deaf children are born when sighted and hearing children could have been born in their place.

This does not necessarily imply that the lives of those who now live with disability are less deserving of respect and are less valuable. To attempt to prevent accidents which cause paraplegia is not to say that paraplegics are less deserving of respect. It is important to distinguish between disability and persons with disability. Selection reduces the former, but is silent on the value of the latter. There are better ways to make statements about the equality of people with disability (e.g., we could direct savings from selection against embryos/fetuses with genetic abnormalities to improving well-being of existing people with disabilities).

These arguments extend to selection for non-disease genes. It is not disease which is important but its impact on well-being. In so far as a non-disease gene such as a gene for intelligence impacts on a person's well-being, parents have a reason to select for it, even if inequality results.

This claim can have counter-intuitive implications. Imagine in a country women are severely discriminated against. They are abandoned as children, refused paid employment and serve as slaves to men. Procreative Beneficence implies that couples

should test for sex, and should choose males as they are expected to have better lives in this society, even if this reinforces the discrimination against women.

There are several responses. Firstly, it is unlikely selection on a scale that contributes to inequality would promote well-being. Imagine that 50% of the population choose to select boys. This would result in three boys to every one girl. The life of a male in such a society would be intolerable.

Secondly, it is social institutional reform, not interference in reproduction, which should be promoted. What is wrong in such a society is the treatment of women, which should be addressed separately to reproductive decision-making. Reproduction should not become an instrument of social change, at least not mediated or motivated at a social level.

This also illustrates why Procreative Beneficence is different to eugenics. Eugenics is selective breeding to produce a better *population*. A *public interest* justification for interfering in reproduction is different from Procreative Beneficence which aims at producing the best child, of the possible children, a couple could have. That is an essentially private enterprise. It was the eugenics movement itself which sought to influence reproduction, through involuntary sterilisation, to promote social goods.

Thirdly, consider the case of blackmail. A company says it will only develop an encouraging drug for cystic fibrosis (CF) if there are more than 100, 000 people with CF. This would require stopping carrier testing for CF. Should the government stop carrier testing?

If there are other ways to fund this research (e.g., government funding), this should have priority. In virtually all cases of social inequality, there are other avenues to correct inequality than encouraging or forcing people to have children with disabilities or lives of restricted genetic opportunity.

LIMITS ON PROCREATIVE BENIFICENCE: PERSONAL CONCERN FOR EQUALITY OR SELF INTEREST

Consider the following cases. David and Dianne are dwarfs. They wish to use IVF and PGD to select a child with dwarfism because their house is set up for dwarfs. Sam and Susie live a society where discrimination against women is prevalent. They wish to have a girl to reduce this discrimination. These choices would not harm the child produced if selection is employed. Yet they conflict with the Principle of Procreative Beneficence.

We have here an irresolvable conflict of principles:

- personal commitment to equality, personal interests and Procreative Autonomy
- Procreative Beneficence.

Just as there are no simple answers to what should be done (from the perspective of ethics) when respect for personal autonomy conflicts with other principles such as beneficence or distributive justice, so too there are no simple answers to conflict between Procreative Autonomy and Procreative Beneficence.

For the purposes of public policy, there should be a presumption in favour of liberty in liberal democracies. So, ultimately, we should allow couples to make their own decisions about which child to have. Yet this does not imply that there are no normative principles to guide those choices. Procreative Beneficence is a valid principle, albeit one which must be balanced against others.

The implication of this is that those with disabilities should be allowed to select a child with disability, if they have a good reason. But the best option is that we correct discrimination in other ways, by correcting discriminatory social institutions. In this way, we can achieve both equality and a population whose members are living the best lives possible.

CONCLUSIONS

With respect to non-disease genes, we should provide:

- information (through PGD and prenatal testing)
- free choice of which child to have
- non-coercive advice as to which child will be expected to enter life with the best opportunity of having the best life.

Selection for non-disease genes which significantly impact on well-being is *morally required* (Procreative Beneficence). 'Morally required' implies moral persuasion but not coercion is justified.

If, in the end, couples wish to select a child who will have a lower chance of having the best life, they should be free to make such a choice. That should not prevent doctors from attempting to persuade them to have the best child they can. In some cases, persuasion will not be justified. If self-interest or concern to promote equality motivate a choice to select less than the best, then there may be no overall reason to attempt to dissuade a couple. But in cases in which couples do not want to use or obtain available information about genes which will affect well-

being, and their desires are based on irrational fears (e.g., about interfering with nature or playing God), then doctors should try to persuade them to access and use such information in their reproductive decision-making.

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