

Technological Innovation and Liberal Theories of Justice

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Abstract: The acceleration of technological innovation in Western liberal societies has in recent years offered the prospect of applications with crucial impact on social and economic life. For instance, in health care, the successful decoding of human genome and subsequent advances of genomics-based technologies (including biotechnology) have enabled the development of cheaper and safer drugs, the introduction of new gene-based diagnostics and biomedical therapies. However, these new technologies have also provoked fears about the potential of genetic discrimination, the re-emergence of eugenics and the problem of access to genomic services. The fairness of distribution of opportunities and risks of accelerated technological innovation constitutes a new problem of justice. Whether liberal political theories can successfully address this problem in the twenty first century? This paper tries to answer the question by evaluating egalitarian liberalism, libertarianism and utilitarianism in terms of their politico-theoretical responses to genomics-related concerns. It is argued that there is a gap between liberal political theories and the new problem of justice emerged in societies of accelerated technological innovation. Egalitarian liberalism, libertarianism and utilitarianism need to be extensively revised if not replaced by less narrow theories of distributive justice in order to be able to deal with such a problem.

1. INTRODUCTION

The acceleration of technological innovation in globalising liberal societies has in recent years offered the prospect of applications with crucial impact on social and economic life. Thus, for instance, in health care, the successful decoding of human genome and subsequent advances of genomics-based technologies (including biotechnology) have enabled the development of cheaper and safer drugs, the introduction of new gene-based diagnostics and biomedical therapies, and the use of clinical procedures of reproduction such as in vitro fertilisation (IVF) and pre-implantation genetic diagnosis (PGD). However, these new technologies have also provoked fears and debates about the potential of genetic discrimination, the re-emergence of eugenics and the problem of access to genomic services. The so called 'Genomic revolution' does not seem to benefit all equally and some people such as the disabled have, in fact, been already disadvantaged by particular applications of genomics-based technologies.¹

The fairness of distribution of opportunities and risks of accelerated technological innovation constitutes a new problem of justice. Whether liberal political theories can successfully address this problem in the twenty first century? The aim of this paper is to answer the question by evaluating egalitarian liberalism, libertarianism and utilitarianism in terms of their politico-theoretical responses to genomics-related concerns. In what follows it is argued that there is a serious gap between liberal political theories and the new problem of justice emerged in advanced societies of accelerated technological innovation. Egalitarian liberalism, libertarianism and utilitarianism need to be extensively revised if not replaced by less narrow theories of distributive justice in order to be able to deal with such a new problem.

This paper is structured as follows: section two presents the new problem of justice, focusing on genomics-related concerns and the question of fairness; section three

investigates whether egalitarian liberalism, libertarianism and utilitarianism can successfully address this problem; section three concludes that liberal political theories need to be either revised or replaced by less narrow theories of distributive justice.

2. THE NEW PROBLEM OF JUSTICE: GENOMICS AND FAIRNESS

To begin with a general definition, as Gottweis (2002: 208) points out, genomics is a field of research that ‘... embraces both the Human Genome Project (the worldwide programme to document the entire DNA sequence of the human genome) and the study of the relationship between genes and cell function in both health and disease (sometimes also called functional genomics)’. The new knowledge provides the basis for understanding of the relationship between genotypes and disease as well as for identifying the genotypes that predispose individuals to a disease. Furthermore, it results in the development of new genomics-based technologies (genetic enhancement, cloning, gene therapy, genetic testing) and treatments that are tailored according to genetic profiles (pharmacogenomics) or are used for diagnosing and monitoring diseases and for locating targets for new molecules. In this respect, according to Gottweis (ibid) ‘...functional genomics can also be seen as representing the beginning of a ‘post-genomic’ era that moves on from the sequencing of genes to assigning some element of function to each of the genes in an organism’. By learning more about their genetic make up, individuals seem to have more control over their health and reproductive choices.

However, as has been already stressed, apart from health opportunities in terms of curing and/or preventing disease, genomics provokes fears about the potential of genetic discrimination, the rise of a new form of eugenics and the possibility of creating greater inequality in society. Let us examine each fear separately, raising some more specific questions.

Genetic Discrimination

Evidence is growing that new genetic knowledge can potentially lead to new forms of discrimination such as exclusion, disadvantage and stigmatisation (Lemke, 2005). Indeed, recent statistics show that there is an increasing fears of the public that genetic information may be potentially used to deny insurance and employment to those individuals who appear to have genetic conditions and predispositions to diseases (Buchanan et al, 2000). For instance, Gottweis (2002: 215) presents a 1998 survey in the United States (US) according to which ‘...85% of US citizens believe that employers should be prohibited from obtaining information about an individual’s genetic conditions, risks and predispositions’. This is not an unfounded belief. Another US survey in 1999 revealed that, indeed, ‘...30% of the large and midsize companies...sought some form of information about their employees and 7% used this information in awarding promotions and hiring’ (ibid). Therefore, people have reason to be concerned, especially in countries with no substantial public-sponsored health insurance such as the US.

Can concerns about genetic discrimination be dealt with from the point of view of fairness? Can the vulnerability of people to exclusion from particular economic and social arrangements, due to their genes, be minimised or indeed eliminated through the application of liberal principles of justice? As will be shown in the next section,

the answer to both questions is negative. Egalitarian liberalism, libertarianism and utilitarianism fail to adequately deal with the issue of equal distribution of natural primary goods (NPGs) such as health and intelligence.

A New Form of Eugenics

Concerns about genetic discrimination due to genomics echo the fears raised by the eugenics movements of 1870-1950. According to Buchanan et al (2000: 28) ‘These large scale social movements, originating in England but ultimately involving public advocates and membership organisations from Brazil to Russia, located the source of social problems in the genes of individuals and sought to alter the pattern by which these genes would be transmitted to future generations’. Eugenacists had different approaches towards human betterment. Some supported ‘positive eugenics’, encouraging the talented to have more children² while some others believed in ‘negative eugenics’, curbing the fertility of those considered to be untalented and developing programmes of euthanasia of the unfit (ibid: 32). In any case, the Nazis endorsement of negative eugenics and their programmes resulted in taking the lives of thousands of people. The Holocaust itself was part of this eugenics campaign. Although after the defeat of the Nazis, eugenacists world-wide were quick to distance themselves from German eugenics (ibid: 39), today genomics-based technologies such as IVF and PDG raise new fears about possible rise of a new form of eugenics. These fears cannot be easily balanced politically with liberal claims for reproductive choice. According to Mitra (2007: 162; emphasis added) ‘Opposition between those who extol the virtues of liberal choice and those who campaign for proscriptive legislation and stronger regulatory oversight has become particularly fevered around the *eugenic question*’.

In fact, a number of crucial issues still remain open: is morally defensible for parents to seek ‘the perfect baby’ by using the aforementioned genomics-technologies? Are genetic enhancements fair? Addressing these issues is presupposed of any just institutional development that can deal with a new form of eugenics. It might be said that eugenics cannot be eliminated through egalitarian liberalism, libertarianism and utilitarianism. As will be suggested in the next section, these political theories of justice do not necessarily reject eugenics as being unfair or morally wrong.

Inequality

Fears about genetic discrimination and a new form of eugenics raise the issue of genomics-related social, economic and political inequality. Specifically, unequal access to such new technologies can exacerbate an already unequal society and widen further the gap between rich and poor. This, as Barry (2005) has recently shown, has negative effects on all peoples’ health, security and well-being because of social pathologies directly linked to inequality. These include social disintegration and violence (Hofrichter, 2003: 3).

What does justice demand in terms of steering genomics? Are people entitled to genetic enhancement, treatment and prevention of disease? Should access to genomics-based technologies be left entirely to the market? Given the narrow perspective of liberal theories of justice, the above questions cannot be satisfactorily answered in terms of egalitarian liberalism, libertarianism and utilitarianism. In

essence, genomics-related social inequality undermines the liberal argument of autonomous individual choice of technological innovation.

3. ADDRESSING THE NEW PROBLEM OF JUSTICE IN TERMS LIBERAL POLITICAL THEORIES

Justice demands that specific concerns about genetic discrimination, a new form of eugenics and social inequality be addressed in terms of normative principles of fair distribution of opportunities and risks of genomics. Which of these principles are the most effective ones? What are the differences between egalitarian liberalism, libertarianism and utilitarianism in addressing genomics-related concerns? Which principles should be applied in genomics? In order to answer these questions one needs to provide a more detailed politico-theoretical analysis of how genomics-related concerns might be addressed in terms of the three competing sets of principles of distributive justice.

Egalitarian Liberalism

It includes principles of justice at the centre of which is the liberal notion of equality. The latter refers to equal liberty of everyone in society. Egalitarians such as Rawls advanced equal liberty from a hypothetical original position of choice of fundamental principles of justice. According to him ‘...the parties in the original position are equal. That is, all have the same rights in the procedure for choosing principles’ (Rawls, 1972: 19). In order to achieve equal liberty, Rawls assumes his original position behind a veil of ignorance. Thus, he says ‘...no one knows his place in society, his class position or social status, nor does anyone know his fortune in the distribution of natural assets and abilities, his intelligence, strength and the like’ (ibid: 12). Despite its arbitrary nature, Rawls’ theoretical construction permits him to derive two basic principles of justice as fairness:

1. ‘Each person has an equal right to the most extensive scheme of equal basic liberties compatible with similar scheme of liberties for all.
2. Social and economic inequalities are to satisfy two conditions: they must be (a) to the greatest benefit of the least advantaged members of society; and (b) attached to offices and positions open to all under conditions of fair equality of opportunity’ (Rawls, 1999: 362).

Certainly, since the first publication of *A Theory of Justice* (1972), a number of critiques have consistently focused on the inadequacy of his arguments, advancing alternative theories of equalitarian justice. Among others, Ronald Dworkin (2002) proposes equal division of resources. In his theory, such a division takes the form of a hypothetical auction between different individuals in the market. Everyone starts with equal amount of resources (starting gate theory) and everyone uses his/her resources to bid for those goods that best suit his/her conception of the good life. The auction is successful if everyone is happy and they do not envy anyone else’s resources (Dworkin, 2002:67-71).

Generally speaking, within egalitarian liberalism, concerns about genetic discrimination, a new form of eugenics and genomics-related social inequality might not be addressed the same way. One needs to recognise that there are important

differences among theories such as those of Rawls and Dworkin. To begin with Rawls, his principle of equal liberty and the difference principle do not justify genetic discrimination. In 'a well ordered society' (Rawls, 1999: 361), free and equal moral persons cannot be excluded from employment, or from health, life or disability insurance if they are known to have genetic diseases or factors that predispose them to diseases. Rawls' second principle of justice is quite clear here. This principle has two parts: '... part (b) ... has priority over part (a), so that the conditions of fair equality of opportunity are also guaranteed for everyone'. This argument is founded upon Rawls' Kantianism that, on the one hand, rejects natural inequalities as 'morally arbitrary' and on the other disapproves of the use of genetic information of free and equal moral persons for the purpose of maximising utility. The question of course is how particular cases of genetic discrimination could be dealt with within a Rawlsian framework. Take for instance the particular case of a person who is known to have a predisposition to cancer. His/her case calls for remedy at the level of equal liberty. This implies that he/she should be offered a package of extra rights and liberties, powers and opportunities, income and wealth which will prevent discrimination in terms of employment and health, life or disability insurance. This package of extra liberties means that the initial cause of the problem e.g. natural inequality is compensated but not eliminated. Therefore, Rawls' theory of justice fails to offer a permanent answer to the question of genomics-related distribution.

Other egalitarians such as Dworkin distinguish between 'derivative' and 'detached' values. Although the former derive from the interests of particular people, the latter are intrinsic to objects or events. On balance, Dworkin (2002) believes that there is an intrinsic value to 'genetic privacy' of each individual but, at the same time, there is a derivative value to dissemination of genetic information in cases of strong public interest. Dworkin (ibid: 434) recognises that a first instinctive response to the risk of genetic discrimination '...is to suppose that the dissemination of genetic information must be under the sole control of its subject'. However, he also stresses that this is extremely difficult to secure in practice. Dworkin raises the following question: 'What about occupations in which a propensity to a disease poses a genuine threat to the public – disposition to heart attack in a pilot, for example, or any grave illness in a president' (ibid). His answer clearly aims to achieve a balance between individual right to 'genetic privacy' and public interest in dissemination of genetic information. Dworkin argues that '...we need to continue to develop standards of fair employment practice, administered by competent agencies that adjudicate between public and commercial interests. But though a few businesses would wish to hire and train somehow who they new would die of Huntington's disease in early middle age, we should prevent most employers from asking information that would reveal a predisposition to that disease' (ibid: 435). Dworkin does not explain who is legitimate to decide whether the balance of public interest falls in favour of dissemination of genetic information. In practice, such a balance is difficult to be achieved in societies of extended markets. Dworkin himself accepts that the private sector should be limited in order for the public interest to prevail over commercial interests. For instance, he clearly suggests that '...basic health and life insurance should no longer be left in private sector...Basic health insurance must be provided for everyone, and it must be financed out of taxation' (ibid). Genetic information should be used in calculating or anticipating the cost but not to discriminate among people. Certainly, Dworkin focuses on institutional actors, overlooking issues of informal discrimination. As Lemke (2005: 25) stresses, however important it may be to expose

discriminating practices by institutional actors such as insurance companies, employers, adoption agencies and other organisations, this disregards a decisive arena of informal discrimination, including disrespect and stigmatisation by family, friends and fellow human beings. This 'everyday discrimination' is also unjust (Buchanan et al, 2000: 65). Therefore, its elimination is presupposed of any substantial realisation of equal opportunity.

Undoubtedly, more than any other egalitarian, it is Rawls who specifies equal opportunity in such a way that requires not only the elimination of legal and informal barriers of genetic discrimination but also efforts to eliminate the effects of brute luck in natural lottery. In other words, he seems to recognise the importance of the brute luck view of equal opportunity according to which there are matters of brute luck which are not within one's control at all. The fact that someone is born with a genetic disease or with factors that predispose him/her to diseases should not in itself lead to person's having lower life prospects than other persons of different genetic conditions. However, elimination of the effects of brute luck in natural lottery does not necessarily mean equal distribution of natural primary goods (NPG) such as health and rigour, intelligence and imagination. As Farrelly (2002: 78) correctly points out 'Rawls' general conception of justice stipulates that only the SPG [social primary goods such as rights and liberties, powers and opportunities, income and wealth, and self-respect] are to be equally distributed, unless unequal distribution of any, or all, of these values is to everyone's advantage. But what about the NPG? Why does Rawls not include the distribution of them in principles of justice?' Farrelly (ibid) again correctly observes that for Rawls although the possession of NPG is influenced by the basic structure of society, they are not under its control.

Of course, what is subject to human control and what is not is a crucial question. Answering this question has implications for the distinction between the natural and the social. According to Buchanan et al (2000: 83) 'Nature, or natural, is often thought to be not only that which is given but also that which must be accepted as beyond human control. In that sense, to say that something is due to nature is to relegate it to the realm of fortune or misfortune, rather than justice or injustice'. Rawls probably never thought that the boundaries between the two realms would be so much blurred by innovation in life sciences and advances of genomics-based technologies. Indeed, as Farrelly (2002: 78) says, 'This point is of utmost importance when considering how advances in genetic research will revolutionise debates concerning social justice. For these technologies will make it possible for the distribution of NPG to be directly (though not totally) under our control'. In other words, genomics will make it possible for the brute luck view to enlarge the domain of equal opportunity to include natural inequalities. These will breakdown the distinctions between persons and goods, subjects and objects of distribution (Buchanan et al, 2000). However, what genomics will not breakdown is the system of private property relations within which any Rawlsian distribution of SPG can take place. This implies that, despite advances in genomics-based technologies, the Rawlsian debate of justice will remain formal.

It is true, of course, that although Rawls seems to recognise the brute luck view, he never shifts away from his main priority that is to address social inequalities under the formal heading of equality of opportunity (ibid). It might be argued that his prioritisation of social over natural inequalities is important because he explicitly recognises that '...the distribution of natural assets ... to some extent ... is bound to

be affected by the social system' (Rawls, 1972: 107). Rawls' recognition is close to what current research in genomics explicitly recognises: genes of individuals are influenced by social environmental factors and therefore most conditions result from the interaction of both. In other words, genes do not form the 'blueprint' for an individual and the 'secret of life' (Lemke, 2005: 53). Rawls' recognition avoids genetic essentialism e.g. emphasis on genetic factors instead of social practices (ibid.). However, given his formal theory of justice, his recognition cannot result in radical changes of the social division of labour that, after all, is responsible for the development of unequal socio-economic environments within capitalism. What it can do is provide a broad framework for addressing concerns about a new form of eugenics. Specifically, as far as Rawls' theory of justice is concerned, it promotes human betterment by means of formal equalisation of SPG. Rawls (ibid) argues that '...it is not in general to the advantage of the less fortunate to propose [eugenic] policies which reduce the talents of others'. Although his theory recognises that natural inequalities such as those based on disease genes have impact on social inequalities and the reverse, it can only justify social interventions to compensate them but not genetic interventions to eliminate them and/or enhance humans by means of selection or replacement of genes. Therefore, recent arguments for eugenic selection of embryos (by employing IVF and PGD) developed by bioethicists such as Savulescu (2001) cannot be sustained within Rawls' framework of justice. As will be shown below, these arguments are based on principles which essentially derive from libertarianism.

Justice is probably the most important thesis against eugenics. According to Buchanan et al (2000), the internal logic of eugenics is inequality and exclusion '...even if we make an effort to accept, for the sake of argument, the eugenicists' warnings about degeneration and their promise of a better society to come'. Unfortunately, egalitarian theories of justice are not properly equipped with arguments that can effectively confront eugenics. Take for instance Dworkin's theory of equality of resources. This theory is based on a combination of individual choice with egalitarian distributive justice. However, it does not seem to provide a satisfactory answer to the question of whether parents practice eugenics when they seek 'the perfect baby' by using genomics-based technologies. Dworkin's arguments implicitly defend an equal auction of genes, provided that genomics-based technologies make it possible for such an auction to take place. Choosing genetic profiles through an equal auction may temporarily pass the Dworkian envy test, but may also create a new eugenicist society of individuals who (they or their parents) were fortunate enough and/or had the knowledge required to select genes favourable to their well-being. In Dworkin's theory, equality of genetic resources can be combined with national health insurance so that genomics-based technologies that save lives become available to everyone as soon as possible (Dworkin, 2002). However, whether combined with insurance or other compensatory schemes, it is certain that this process will have negative impact on the structure of society, increasing social inequalities in the long run.

It might be argued that egalitarian liberalism fails to deal with such inequalities effectively. For instance, Dworkin (ibid: 437) claims that '...rich people should be allowed to purchase therapy, at market rates, beyond what calculation would mean providing for everyone'. His argument is that we should seek equality by levelling up and not down. This argument justifies genomics-related social inequality. Similarly, Rawls' difference principle justifies unequal access to genomics-based technologies,

treatment and prevention of disease if this is to the greatest benefit of the least advantaged members of society. The question is: can unequal access to genomics-based technologies such as IVF and PDG ever be in the greatest benefit to the least advantaged members of society? The answer is negative. Rawls' difference principle only allows a small number of people, the wealthy and rich, to test for disease genes, receiving appropriate treatment. Even if we assume that IVF and PDG would be eventually made available to the least advantaged, after a few years time, their position would have been exacerbated in comparison to the advantaged.

Libertarianism

It includes principles of justice which are founded upon inviolable individual rights. Thus, according to Nozick (1974: ix) 'Individuals have rights, and there are things no person or group may do to them (without violating their rights)'. Libertarians hold that social re-distribution violates individual rights and especially the right to self-ownership, e.g. '...every person is morally entitled to full private property in his person and powers. This means that each person has an extensive set of moral rights ... over the use and fruits of his body and capacities ...' (Cohen and Graham, 1990: 25). On the grounds of self-ownership and moral inviolability of persons, libertarians develop principles of justice which presuppose a minimal state. For instance, Nozick (1974: 151) argues that 'If the world was wholly just, the following inductive definition would exhaustively cover the subject of justice in holdings.

1. A person who acquires a holding in accordance with the principle of justice in acquisition is entitled to that holding.
2. A person who acquires a holding in accordance with the principle of justice in transfer, from someone else entitled to the holding, is entitled to the holding.
3. No one is entitled to a holding except by (repeated) applications of 1 and 2.'

Libertarians consider themselves to be in the antipodes of egalitarian liberalism. For instance, Nozick (ibid) attacks Rawls for failing to respect the separateness of persons by redistributing the economic and social goods that flow from their own natural goods to those whom nature has endowed less generously (Dunn, 1996). Therefore, the libertarians can only address concerns about genetic discrimination, a new form of eugenics and social inequality from the standpoint of inviolable individual rights. To begin with Nozick, he insists that each person is morally entitled to his/her own body and powers. From this it follows that each person also has the moral right over the possession of his/her own genetic information. No one is morally justified to interfere with the self-ownership of each person without his/her consent.

The principle of self-ownership, at first glance, appears not to justify genetic discrimination. No one, including employers and insurance companies, is formally entitled to medical records and genetic profiles of persons without their consent. Therefore, theorists such as Moore (2000) defend self-ownership and advance a libertarian model of private property founded upon Locke's theory (1988). For them, libertarianism is the only answer to the question of privacy and the '... right to maintain a certain level of control over the inner spheres of personal information' (Moore, 2000: 104). However, there are no easy answers in political theory. Moore

and 'Nozick-style libertarians' fail to see that their prioritisation of self-ownership does not morally prevent employers and/or insurance companies in the market from forcing economically weak or propertyless individuals to reveal their private genetic information in return of employment and/or promotion and/or insurance. In fact, this is a problem of prioritisation of self-ownership over freedom that has been exposed great deal by Gerry Cohen. Throughout his *Self-ownership, Freedom and Equality*, he persuasively argues that '... Nozick's real view is that the scope and nature of the freedom that we should enjoy is a function of our self-ownership' (Cohen, 1995: 67). Indeed, the principle of self-ownership justifies persons who are entitled to their genetic information to transfer them to someone else via the market, no matter the exploitation that takes place in the capitalist process of exchange. This principle reacts against any state of welfare that protects employment and provides insurance to economically weak and property-less persons.

The main concern of Moore and 'Nozick-style libertarians' is violation of self-ownership for the sake of social welfare or utility. According to them, if we are serious about privacy rights, we should impose prohibitions against disclosing genetic information. These prohibitions should be independent of any anticipated gains in social welfare or utility. Especially Moore (2000) uses his argument of self-ownership and privacy rights as a justification for the lift of bans on genetic therapy. According to him, 'Top-down laws that seek to regulate genetic therapy will almost always interfere with individual liberty and privacy' (Moore, 2000: 111). A similar argument can also be found in another 'Nozick-style libertarian' named Savulescu. He consistently defends 'procreative autonomy' against any state intervention. According to Savulescu, '*Procreative autonomy* is the liberty to decide when and how to have children according to what parents judge is best. Parents know best their circumstances, and ultimately it is parents who must live with and make sacrifices for their children' (Savulescu, 2006: 148; emphasis added). Both Moore and Savulescu exclude social welfare or utility from their arguments while, at the same time, they open the door to a new form of eugenics based on the right of each self-owner to chose his/her genetic profile and his/her children's genetic characteristics.

Indeed, self-ownership can justify each individual or group of individuals to develop their conception of human betterment and promote it through positive eugenics. The latter does not directly interfere with each individual's rights to own his/her body and in this sense it does not directly violate self-ownership. For instance, parents who voluntarily chose to join a group of individuals who have a particular conception of human betterment might be encouraged to seek 'the perfect baby' in accordance with this conception and so to select the best child without exercise of external force. The principle behind their choice is defined by Savulescu as 'procreative beneficence'. According to this principle, '...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' (ibid: 145). The principle of procreative beneficence requires couples to employ genetic tests for non-disease traits that will have positive impact on child's well-being. The latter is clearly conceived instrumentally in terms of couples' desires as parents. For instance, sex selection might represent parents' desires related to their child's well-being in a particular social context of sex discrimination. Savulescu (2006: 147) argues that '...it is unlikely that any parent ever desires a child solely as an end in itself...Provided that parents love their child as an end in itself, there is no problem

with the child's life also fulfilling some of the parents' desires for their own life'. This argument is problematical for two reasons: firstly, if we assume that parents desired a child as a means to fulfilling their desires in the first place, there is no reason for us to believe that they would love their child as an end itself; secondly, to echo Habermas' (2003) recent moral reservations, eugenic programmes based on self-ownership can only be compatible with libertarianism if the encouraged genetic interventions do not limit the opportunities of individuals to lead autonomous and meaningful lives (Nozick, 1974: 312). This does not seem to be always possible. As Habermas (2003: 96) stresses '... eugenic practices...carry the risk of harming the sense of individual autonomy as well as the moral status of persons so treated'.

Another argument against 'procreative beneficence' is that it promotes a particular conception of human perfection, violating the principle of value pluralism in a liberal society. More importantly, 'procreative beneficence' creates injustice in the distribution of opportunities and risks. For instance, who would benefit from the particular conception of human perfection that the 'procreative beneficence' principle promotes? With respect to this question, De Melo-Martin (2004: 81) discusses an interesting hypothetical case. Suppose, he says, '... that access to technologies that help us select our children depends on the ability to pay. And suppose also that in this society women are discriminated against. Following the principle of procreative beneficence those with access to the necessary technologies will select for boys, thus increasing their chances at a better life. Those who do not have access to the technology will have to rely on chance. It is quite likely that these boys would be better off, at the same time that their parents' choices have contributed to the discrimination against women'.

Clearly all these recent attempts from 'Nozick-style libertarians' to justify eugenics on the grounds of self-ownership imply that libertarianism is open to both natural and social inequalities. For instance, if one adapted Nozick's classical entitlement theory of justice in a eugenics context, one could put forward the following principles:

1. A genetically enhanced person who acquires a holding in accordance with the principle of justice in acquisition is entitled to that holding.
2. A genetically enhanced person who acquires a holding in accordance with the principle of justice in transfer, from someone else entitled to the holding is entitled to the holding.
3. No one is entitled to a holding except by (repeated) applications of 1 and 2.

The adapted principle of original acquisition is concerned with the appropriation of unheld things, while the adapted principle of transfer is concerned with the process through which justly held things can be transferred to other persons. In a eugenics context though, both principles assume that genetically enhanced persons are self-owners and there is a realm of free market. The third adapted principle is that of rectification and uses historical information about previous injustices.

It might be argued that the first adapted principle of entitlement theory excludes non-genetically enhanced persons from the acquisition of external resources and divides society into social groups of genetically enhanced property owners and non-

genetically enhanced propertyless persons. The former are not only distinguished from the latter in terms of intelligence, talent, etc., but also in terms of wealth, social power, prestige, etc. In this sense, eugenics-related inequality is transformed into social inequality and exclusion. The second adapted principle of entitlement theory reproduces social inequality and exclusion via the market, widening the gap between genetically enhanced property owners and non-genetically enhanced, propertyless persons.

Utilitarianism

Both egalitarian liberalism and libertarianism can be seen as responses to utilitarianism. The latter claims that people ought to act in such a way that they produce the greatest happiness for the members of society. Utilitarianism is a consequentialist theory of political morality. This means that 'It demands of anyone who condemns something as morally wrong that they show who is wronged, e.g. they must show how someone's life is made worse off. Likewise, consequentialism says that something is morally good only if it makes someone's life better off' (Kymlicka, 1990: 10). Certainly, there are different versions of utilitarianism: hedonistic utilitarianism, welfarist utilitarianism, preference utilitarianism, etc. However, utilitarianism, especially in its hedonistic version advanced by Bentham (1776) and Mill (1837), conceives happiness as a sum of pleasures. Pleasure is morally good and pain is morally bad (Raphael, 1994). As Dworkin (1981: 160) points out, utilitarianism is a goal-based theory concerned with the welfare or well-being of each individual. Therefore, this theory is competing with right-based theories of justice, including Rawls' egalitarian liberalism and Nozick's libertarianism. For utilitarians, rights are just legal obligations which contribute to maximization of the aggregate utility (Lyons, 1984). Bentham (1776: 11-12) defines utility as the '...principle which approves or disapproves of every action whatsoever, according to the tendency which it appears to have augment or diminish the happiness of the party whose interest is in question ...'. This principle is considered to be the only one that gives equal weight to competing interests of different individual actors in a liberal society (Hare, 1982).

Utilitarianism is a theory that competes with both egalitarian liberalism and libertarianism in answering the question of fair distribution of genomics-related risks. Specifically, in utilitarianism, concerns about genetic discrimination, a new form of genomics and social inequality might be dealt with from the standpoint of maximisation of aggregate utility or well-being. This implies that judgements might be made on the grounds of consequences and welfare. The latter constitutes what Rawls (1982) would call one rational good. Therefore, for utilitarians, genetic discrimination is not intrinsically immoral. Employers, insurance companies and even the state are justified in obtaining information about an individual's genetic conditions. They are also justified, on the grounds of this information, to exclude him/her from particular economic and social arrangements, provided that this results in maximisation of general utility or aggregate well-being. Thus, for instance, a company or an organisation is justified in excluding an individual from the position of chief executive officer (CEO) if he/she was screened and was found to have a predisposition to the development of a disease that might compromise his/her performance and consequently minimise aggregate utility of the company or the organisation.

Certainly, utilitarianism epistemologically fails to provide 'objective' measures of aggregate utility while, at the same time, totally neglects rights and freedoms. This has huge impact on addressing genomics-related concerns about a new form of eugenics and social inequalities. Specifically, utilitarianism can justify the suppression of reproductive freedoms for the sake of development of a eugenics society that maximises aggregate utility and/or happiness. Given the epistemological problem of measuring the sum total of utility and/or happiness, utilitarian social groups or indeed the state might advance a particular programme of human betterment and impose on individuals the eugenic selection of embryos through the use of IVF and PGD. In this case what is in play is a principle parallel to Savulescu's principle of 'procreative beneficence' that requires couples to select the child who is expected to have particular traits (e.g. intelligence, talent, etc.) that will maximise his/her well-being, eventually contributing to maximisation of aggregate utility. This principle is indifferent to the autonomy of particular couples.

Utilitarianism as such is also indifferent towards inequalities in the distribution of utility or social welfare. What matters is the sum total. Therefore, utilitarianism is deeply unfair to couples who are either economically or emotionally incapable of selecting the child who is expected to have the best life. In this sense, utilitarianism also fails to prevent the transformation of eugenics-related inequality into social inequality and exclusion. Utilitarianism justifies interventions only if social inequality and exclusion result in producing aggregate disutility. According to Hare (1982: 27) '...inequalities tend to produce, at any rate in educated societies, envy, hatred and malice, whose disutility needs no emphasising'. From this he concludes that '...utilitarians have no need to fear the accusation that they could favour extreme inequalities of distribution in actual modern societies' (ibid). However, it might be said that the accusation still holds in the case of eugenics. In a eugenic society social inequalities might become extreme because there will surely be a number of people who, due to emotional or other reasons, will refuse selecting children with the best life expectations.

4. CONCLUSION

The aim of this paper has been to answer the question of whether liberal political theories can successfully address the new problem of justice in western societies e.g. the problem of fair distribution of opportunities and, especially, risks of accelerated technological innovation such as genomics. In order to do so, the paper has briefly outlined the politico-theoretical responses of egalitarian liberalism, libertarianism and utilitarianism to genetic discrimination, a new form of eugenics and inequality. From these responses it becomes clear that liberal political theories are unable to deal with the new problem of justice in the twenty first century.

First of all, egalitarian liberalism, represented by theorists such as Rawls and Dworkin, compensates for genomics-related discrimination but fails to deal with the issue of distribution of NPG. The dispute here is about what is natural and what is social. New technological innovation such as genomics has changed the idea that nature, including human nature, is fixed and beyond our control. This change, as Buchanan et al (2000: 94) correctly observe, presents a profound challenge to traditional theories of justice and the very notion of moral progress. Indeed, if we have the opportunity to change ourselves in whatever way we choose, then justice

ceases to be a moral process through which the gap between social action and nature can be closed. To put it another way, justice no longer requires natural inequalities be compensated but be directly tackled through genetic interventions. These interventions need to be accompanied by substantial changes in the social division of labour, leading to equal distribution of both natural and social goods. Secondly, libertarianism, represented by Nozick and his followers, including Moore and Savulescu, exclusively focuses on defending self-ownership, ignoring the negative consequences of individual reproductive behaviour. Genetic discrimination and illiberal eugenics of private property owners might be seen as some of the most likely negative consequences of libertarianism. Thirdly, utilitarianism, despite its consequentialist nature, fails to prevent genetic discrimination, a new form of eugenics and social inequality. These new phenomena do not constitute challenges to utilitarian justice unless it is demonstrated that they can threaten maximisation of aggregate utility. Such demonstration, of course, can never be objective due to the epistemological problem of calculating aggregate utility.

Overall, it might be concluded that liberal theories are too narrow for addressing wider challenges of justice in societies of accelerated technological innovation. Therefore, they need to either be extensively revised or replaced by new more open (in terms of basic assumptions) theories of justice.

NOTES

¹ A number of disability rights activists have already argued that clinical procedures such as PDG constitute abuses against the disabled (Mitra, 2007; Buchanan, 2000).

² See for example the selective breeding experiment that took place in the Bible Communist Oneida Community in New York (Richards, 2004).

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