# Some Jewish thoughts on genetic enhancement

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## ABSTRACT

The issues of the ethics of germ line modification in general and of enhancement by germ line modification in particular have been the subject of hundreds of articles in the bioethical literature. Both because the techniques are far from perfected and because the potential long term side effects are unkown, there is a widespread consensus that germ line modification for enhancement is absolutely unethical and beyond the pale at the present time.

The author considers a thought expperiment projecting into the future in which perhaps the safety and reversibility of germ line modification have been clearly demonstrated. Under such circumstances it is contended that the dividing line between treatment and enhancement is difficult and indeed perhaps impossible to maintain.

The Jewish tradition is examined and from the various sources cited it would seem that the benefits of certain kinds of genetic enhancements might well outweigh the objections to such manipulations.

It must be stated at the outset that the following presentation is largely theoretical, certainly as far as germ line modification is concerned. At the present time the techniques for germ line modification are very far from the consideration of their use in humans by ethical scientists. As Francis Collins stated to the President's Council on Bioethics[1] regarding the status of necessary safety techniques, "we are nowhere near meeting and I think will not be for the foreseeable future". The techniques are primitive, even for somatic cell modification; the potential benefits and certainly the possible side effects are unknown. In the state of present knowledge, the changes which are meant to be passed on to future generations would essentially be irreversible. These limitations are valid even for germ cell modifications which are meant to eliminate serious disease states. Therefore, there is virtually unanimous opinion among scientists—no less than among ethicists—that any attempt at germ cell modification in normal individuals in order to enhance any of their attributes is absolutely unethical and beyond the pale.

There have been hundreds of articles written about the ethics of enhancement and its implications in contrast to the treatment of disease. The world cannot permit itself to ignore the infamous era of eugenics in the first half of the 20th century. This virus, which in its most malignant and extreme form of course infected Nazi Germany but did not leave democratic Western countries such as the USA and Scandinavian countries unscathed, has left its scars—appropriately so. On the other hand, the trauma of this unfortunate era must not yield to a paralysing neurosis whereby blanket prohibition of genetic modification becomes the norm.

In the present discussion I will deal mainly with the theoretical aspects of the issue since, as I have pointed out, the current state of the science justifies a blanket prohibition of all genetic germ cell manipulations. For the sake of the analysis, I will use a thought experiment with certain assumptions which for now may be science fiction and may or may not ever be realistic. I will assume that science has advanced to the stage at which germ cell genetic modification has been perfected and scientists can manipulate the genes safely and predictably. Let us also assume for the sake of the thought experiment that data have accumulated over several generations. Furthermore, techniques have now been developed to enable reversal of the genetic modification if for whatever reason we choose to do so, or if the second or third generation so desires. Germ line modification for disease prevention has now become an acceptable and safe procedure. We now face the question of whether and to what extent one should permit genetic manipulation for the sake of enhancement.

The expressed opposition to the use of genetic manipulation for the sake of enhancement is influenced by several factors, only some of which I will mention. First, there is the tragic history of the misuse of genetics based in part on a gross misunderstanding of science and subsequently on evil racism which reached its ethical nadir during the Nazi regime. Second, imaginative writers from Huxley on have depicted all kinds of potential misuse of genetics in the future as a result of massive application and misuse of genetic modifications. Novels such as *The Boys From Brazil* fantasising on the creation of clones of Nazis have cast suspicion on all of genetic manipulation.

Misuse of steroids and other drugs in athletic contests, which epitomise more the unethical aspects of unfair competition rather than the question of enhancement per se, while unrelated to genetics, has had the side effect of exaggerating the fear of genetic enhancement which might also be used, for example, for creating athletes and other individuals with abilities well beyond the current human norms.

It is important not to fall prey to genetic exceptionalism,[2] a term which describes an emotional response to almost all aspects of genetics in a kind of neurotic reaction which treats genetics emotionally rather than dispassionately. An example of this kind of thinking occurred several years ago at a meeting of the Israeli national ethics committee dealing with the use of preimplantation genetic diagnosis (PGD) to eliminate a variety of diseases during in vitro fertilisation. Some ethicists insisted that the Ministry of Health draw up

guidelines about the specific diseases and/or malformations for which PGD would be permitted or forbidden. This proposal was considered seriously in a society and at a time when abortions are permitted through most of pregnancy for almost any trivial fetal malformation, and by the same individuals who raised no similar demands about abortions. Thus abortion, which by any standard represents a more serious ethical problem, was unchallenged while PGD, because of the emotional attitude towards genetics, was questioned.

One of the major issues is whether one can clearly differentiate enhancement from disease treatment and, if we can do so, should we adopt a policy under which only the latter should be permitted? I believe that the answer is negative on both issues. Let us take an example in daily use which is widely accepted by almost all. Immunisations clearly are enhancements of human natural abilities, but they do prevent disease and so they have been accepted by almost all ethicists. Western medical practice encourages behavioural norms and medications that definitely prolong life by preventing atherosclerosis, and thus coronary artery disease. One might conceivably develop genetic modifications that would affect the width and pliability of coronary arteries, or increase the synthesis of high density cholesterol—the so-called 'good cholesterol'. The effect would be a deferment of atherosclerosis and coronary artery disease, but this would clearly result from an enhancement well beyond the normal state.

In all likelihood major depressive disorders have a genetic origin, and those who would accept genetic modification for disease treatment might therefore accept gene manipulation to prevent serious depressive disorders. But within the spectrum of normality, there are also enormous variations in response to stress and life crises. Antonovsky,[3] impressed by individuals who had demonstrated an unusual resilience to adversity such as concentration camp internment, coined the term 'salutogenesis' (in contrast to pathogenesis), the factors predisposing to health rather than disease. He explained salutogenesis by a 'sense of coherence',[4] a feeling of meaning in life, in terms of environmental and perhaps cultural factors.

But there is now evidence that there may be genetic factors which predispose individuals to react in a healthy or unhealthy way to stress. Recent work by Caspi and colleagues[5] have shown, in a study of 847 young people in New Zealand, that individuals with two long alleles for a molecule (5-HTT) that affects the transmission of serotonin were half as likely to develop depression in response to life events as were those with two short alleles. Thus, conceivably, by alteration of genes one might create individuals who can handle life stresses better—surely an enhancement—and one which may prevent disease (suicide) and suffering. These results confirmed earlier animal experiments.

The same group of investigators had made similar findings[6] with respect to the interaction of childhood abuse and a gene for an enzyme (MAOA) involved in the regulation of several neurotransmitters. The chances of a boy exhibiting subsequent antisocial behaviour as an adult was affected jointly by his genotype as well as by his early childhood environment.

Enhancement of intelligence has been one of those aspects feared by opponents of genetic manipulation. But there are increasing data that enhancement of intelligence within the normal range may result in extending life expectancy. A group of researchers from Scotland[7] recently presented preliminary data suggesting that childhood IQ affects adult mortality. It has also been shown[8] that higher cognitive function in middle age, as measured by three tests, is associated with lowered mortality, a result confirming previously reported data in elderly people by several investigators.

At a recent meeting of the International Society for Intelligence Research[9] there were a number of reports suggesting that higher IQ was associated with greater success in terms of health, longevity and daily functioning. The reasons for these results are unclear and are probably varied. But again, what at first glance seems merely enhancement can readily be shown to be a form of treatment in that death and disability are prevented or delayed.

The staff working paper of the President's Council on Bioethics on distinguishing therapy and enhancement[10] pointed out that 'the distinction between therapy and enhancement is hard to articulate for three principal reasons: (1) they are not mutually exclusive; (2) the activity involved is often the same; and (3) the standard of health and "improvement" against which the difference between therapy and enhancement might be measured can be very hard to define'. The authors nevertheless feel that it is important to distinguish the two, but seem unable to provide the necessary criteria for this distinction. Increasingly, the idea that enhancement and treatment cannot be clearly distinguished is achieving wider acceptance[11 12] and it is becoming clear that such a distinction in any but the most egregious examples of enhancement is extremely difficult.

But even if we were to draw a line between treatment and enhancement, it is not at all clear that the role of medicine must be confined to disease treatment. That would, in my opinion, be an inappropriately narrow view of the role of medicine which is really to enhance health. Health promotion is increasingly seen as part of the physician's role. The WHO definition of health certainly is extraordinarily broad and clearly would encourage actions by physicians that could easily encompass enhancement.

Enhancement has often been described pejoratively in terms of a parent who wants his child to be eight feet tall because he aspires to have a son who will be a star basketball player, or by a variety of other such examples whose results might well restrict the child's life opportunities in order to direct him/her into the specific pathway chosen by the parents. But enhancement, if used thoughtfully, could much more likely be used, for example, to improve a child's musical talent in a family that has little such ability, or to improve a child's IQ from low normal to high normal, or to enhance physical coordination. All of these various enhancements would not just improve the quality of the child's life but might even prolong life and prevent disease, and would broaden the child's opportunities rather than narrow them. Making life easier is liberating rather than confining and restricting.

In the report of the President's Council[13] they summarised the issue succinctly: '… relying on the distinction between therapy and enhancement to do the work of moral judgement will not succeed'. Just as in current medical practice in which a great deal of treatment could just as readily be categorised as enhancement, there are enhancements which most would accept as reasonable and other kinds of enhancement that many would label as unreasonable and undesirable. But enhancement in and of itself should not be regarded as a pejorative word.

Certainly within the American ethos the 20th century has witnessed what the Rothmans have called the 'pursuit of perfection'[14] in their recent book of that title. While it is true that this pursuit is perhaps most strongly apparent in the USA, Baylis and Robert[15] argue convincingly that the use of genetic enhancement technologies is inevitable because of a variety of reasons, but mostly because of an inherent and universal human tendency to strive to be masters of our human evolutionary

future. They therefore contend that, rather than engaging in futile efforts to stop genetic enhancement techniques, ethicists would do better to try to influence the directions that these techniques will take and ensure proper direction for them.

All of the above is written from a general ethical point of view. What might be a specifically Jewish point of view and would it be more or less positively inclined? What are the goals and duties in life of human being according to the Torah? Clearly, these are to serve God and to act in a way that glorifies His name. Actions which enhance a person's ability to accomplish these goals would be laudable.

Maimonides and a whole series of Jewish scholars and rabbis were physicians, and the medical profession has for centuries had an unusual attractiveness for Jews. Prevention of disease or health promotion was always primary in the traditional definition of the role of medicine.

In the Torah, the Lord promises[16] that 'the diseases that I brought on Egypt I will not bring unto you for I am the Lord your healer', clearly defining the role of the physician as one who carries out preventive medicine. In his many medical writings, Maimonides places major emphasis on disease prevention and health promotion, and there is no clear demarcation anywhere in the Jewish tradition between treatment and prevention. The latter is to be preferred, and only if it fails does the physician have to treat.

Whereas interference with nature and playing God are some of the objections raised to genetic enhancement, these views find little support in Judaism. Indeed, man is commanded to be a co-creator with his Creator in many areas of endeavour. 'Fill the earth and conquer it'[17] is interpreted in Jewish sources as a mandate to activism on the part of man. The sentence in Genesis[18] about the creation of the world reads 'which the Lord has created, to do'. The latter two words are interpreted as a statement that God has left the creation unfinished with the expectation that man is to expend energy and thought to 'complete the job', as it were.

In the Talmud and Midrashim there are a number of discussions whereby rabbis use circumcision, bread and wine making and the prescription of medications as examples of man's accomplishments in the area of human creativity. These activities are seen as a form of *imitatio dei*, examples of the command to follow the example of the Creator. In addition, there are references to the fact that, in the after life, man will be called to account if he has not exploited his abilities for improving the world (*tikkun olam*).

Rabbi Judah Loew (Maharal from Prague) stated[19]: 'the creativity of people is greater than nature. When God created in the six days of creation the laws of nature, the simple and the complex, and finished creating the world, there remained additional power to create anew, just like people can create new animal species through inter-species breeding … People bring to fruition things that are not found in nature; nonetheless, since these are activities that occur through nature, it is as if it entered the world to be created…'. In other words, human creativity is inherent in the creation of the world and is a positive and appropriate activity.

Rabbi Joseph B Soloveichik posits that creativity is a human responsibility and not a heavenly monopoly. It is forbidden for man to be merely a passive observer of the universe and its problems. He writes, 'Dignity of man expressing itself in the awareness of being responsible and of being capable of discharging his responsibility cannot be realised as long as he has not gained mastery over his environment … Man of old who could not fight disease and succumbed in multitudes to yellow fever or any other plague with degrading helplessness could not lay claim to dignity. Only the man who builds hospitals, discovers therapeutic techniques and saves lives is blessed with dignity … Civilised man has gained limited control of nature and has become, in certain respects, her master, and with mastery, he has attained dignity as well. His mastery has made it possible for him to act in accordance with his responsibility …'.

In the word of Ecclesiastes,[21] 'Man cannot conquer the spirit to confine it'. One cannot not limit man's curiosity and desire for knowledge.

But as the wise writer of Proverbs tells us,[22] 'Fortunate is the man who is ever fearful'. There is, of course, an ever present caveat that, in all man's endeavours, he must recognise his limitations, make certain that imitation of God does not lead to self-worship and hubris as occurred in the biblical tower of Babel narrative. But by most Jewish interpretations of this narrative, it was not the striving to improve upon nature that was sinful but rather the motivation. They were not concerned with the enhancement of the human being but for his exploitation for the enhancement of their egos.

Among major traditional exegesists, Nachmanides stands out in support of species-specific telos which should not be tampered with,[23] but he is in a distinct minority among his contemporaries and successors.

In more modern times the late Rabbi Eliezer Waldenberg[24] exemplified bioconservatism in his opposition to artificial insemination, much of organ transplantation, in vitro fertilisation and cosmetic surgery, but he was in virtual isolation even among the most Orthodox rabbinic contemporaries.

Man is also commanded to act within the bounds of what is permitted according to the moral code of Judaism, and towards goals that are in keeping with the spirit as well as the law. But it is important to emphasise that, in the Jewish tradition, that which is not expressly forbidden is generally permitted. Permissiveness is the 'default mode'.

Jewish sources from time immemorial have recognised the existence of genetic influences, both in man and animal. In the Biblical narratives Jacob tried to influence the qualities of the sheep he tended by genetic manipulation. The Midrash tells us of the striking resemblance of Isaac to Abraham to belie the charges that Abraham was not Isaac's father. There are references that strongly encourage taking precautions when choosing a mate to include genetic factors in one's considerations. A tall person is cautioned not to marry another tall individual for fear of giving birth to a giant. Similar admonitions are given with respect to other physical features. One is to avoid matings which may lead to significant deviations from norms of appearance. One is encouraged to choose a mate positively with consideration given to positive family features. Particularly, one is advised to check the qualities of the potential wife's brothers because the offspring of the mating are likely to resemble them. Scholars made great efforts to seek out the very best students in the academy for their daughters. It has been suggested that some of the high intellectual achievements among Jews occurred because the most highly intelligent and educated Talmudic scholars who also had many children (to fulfil the Biblical mandate) intermarried with other highly talented scholars. In contrast, some of the best minds in Christian society in the Middle Ages, the priests, remained celibate by choice.

In an attempt to influence the nature of one's offspring, it is related in the Talmud that Rabbi Yohanan, a Talmudic sage, would station himself outside the *mikvah* (ritual bath) so that women emerging from the *mikvah* would see him and this would (in the beliefs of that time) influence the nature of their

offspring conceived on the night of the ritual immersion. Here we see a clear example of an attempt to manipulate the genetic pattern in a woman similar to Jacob's attempt with the sheep in the Bible. Obviously this episode bears no resemblance whatever to manipulation of genes, but within the knowledge and beliefs of that time we are presented with a positive attitude towards influencing the qualities of a fetus rather than a passive acceptance of the result of natural events.

In Judaism one has an obligation of *gemilut hesed*, to help others, to make their life more pleasant, to reduce suffering. The activities fall under the rubric of 'love your neighbour as yourself'. While it might seem unreasonable to mandate such an obligation to a yet non-existent entity, to future generations there is no reason not to consider such an act as meritorious. In the hierarchy of good deeds, the highest is *hesed shel emet* (an act of true loving kindness) which describes attending a funeral and caring for the body since there is no chance for repayment. I might suggest that, in a similar vein, making an effort to help future generations might be called *hesed shel emet* since, in general, they cannot repay the individual.

Parents have obligations towards their offspring, not just to provide basic sustenance and education but to give them the tools to support themselves and to thrive in the world. Swimming lessons and the teaching of an occupation are specifically mandated. In the Jewish tradition, grandchildren are often regarded as equivalent to children. Thus, while again it is hard to find a specific mandate to enhance the opportunities of generations to come beyond one's children, it would seem that such an action would be praiseworthy.

How does Halakhah look upon enhancement in everyday non-genetic medicine? As is well known, *pikuach nefesh* (saving of life) is one of the highest values in Judaism and one is not permitted to risk one's life unnecessarily. Thus, the question has been asked about the permissibility of activities such as cosmetic surgery which are not strictly therapeutic and yet do have an element of risk. In many cases, cosmetic surgery has been permitted by leading rabbis—for example, to enhance one's chances of finding a marriage partner or to find employment—because Halakhah has a broad view of the role of medicine and man's welfare. This attitude is in keeping with classic Jewish sources such as Maimonides whose view of medicine encompasses mental as well as physical health promotion as a means to cure.

The data cited earlier suggest, for example, that raising intelligence from low normal to high normal has significant impacts on health and on successful functioning within and on adapting to society to the point of lengthening life. It would also be expected that enhancement of other physical, intellectual and emotional qualities would probably add health and longevity to humans and would certainly make their life more pleasant. They should therefore be looked upon favourably by the Halakhah.

Objections have been raised by some that the use of genetic manipulation, like the use of drugs, to achieve stress reduction and more desirable behaviour are somehow undesirable whereas achieving those same goals by sustained human effort is to be commended. One might even suggest that this differentiation can find support in Judaism. For example, the study of the Torah is one of the major duties of every Jew. Not only is study commendable because the knowledge of the Torah in all of its ramifications improves one's ethics and morals, but there is additional great value attached to the *amal*—the struggle and effort. One is specifically commanded to maximise effort in one's studies. It might be argued that by drug or genetic manipulation, thereby making the achievement of the goals easier, one is bypassing the *amal* and this should be interdicted. My personal view is that, by making the task easier, one merely sets the standards higher so that the *amal* will be at a more sophisticated level, since there is almost no limit to human aspiration and ability to accomplish in the field of human knowledge and Torah study. Introduction of the printing press by Gutenberg and the computer in our lives has made Torah study much easier. Surely no one would argue that easing the struggle of research by these innovations would be looked upon unfavourably. These innovations merely freed the scholars to devote their efforts to more productive though no less difficult activities. So, too, enhancement of one's intelligence, of one's ability to concentrate or remember would be a positive accomplishment.

Another argument against genetic enhancement is that it may create two societies, the genetically enhanced who will naturally come from those segments of society who are already advantaged, the so-called 'genobility' while the disadvantaged, who will not benefit from this expensive manipulation, will be doomed to be a permanent underclass. This is a serious concern but is not inherent to the technique; rather, it results from society's application of the technique. The same charge can be made in almost every area of human creativity and endeavour. The advantaged will in all likelihood be the ones who will be able to take advantage of the innovations as they have almost always been. Thus, it is incumbent on society to see that its resources are distributed equitably, but that is not a reason to deny progress. Theoretically, one could envisage a truly just society that would preferentially provide these new services to the disadvantaged in a sort of 'headstart' programme or affirmative action.

In summary, if indeed the safety and reversibility issues in genetic engineering are solved, there should be no inherent banning of the use of these techniques for enhancement, any more than for treatment. Just as the attitude towards conventional medicine today, each application should be evaluated on its merits—goals, dangers and consequences.

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## Notes