List of Abstracts

The Ethics of Genetic Enhancement: An International Workshop

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Centre for Bioethics & Department of Philosophy
The Chinese University of Hong Kong

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David Archard
Genetic Condition Decision-Making and Slippery Slopes
One kind of objection to the further use of genetic engineering – even to help avoid the
inheritance of serious conditions – is that it risks a slippery slope to something
unacceptable. Slippery slope arguments are notoriously difficult to evaluate. Most
distinguish between logical or argumentative and empirical or causal. Classic
argumentative SSAs deploy what Govier calls the fallacy of assimilation. Whereas
argumentative SSAs may be shown to be fallacious, causal SSAs will have to be shown
to unsupported by the evidence or (more strongly) disconfirmed by the evidence.

I examine SSAs which combine empirical and argumentative in the following way:
those who make a decision in respect of A will find it hard to resist approval of A₁ (and
sequentially then A₂, etc.) and this will be in large part because of the difficulty of
showing a relevant difference between A and A₁. I will speak from experience as Chair
of the UK Human Fertilization and Embryology Authority’s Statutory Approvals
Committee charged with approval of licenses of conditions for which PGD can be used.
I will share the statutory test decision tree used by this Committee and suggest some
features of our decision making that militate against sliding down a slope but that might
be viewed as open to other kinds of criticism.
Michael Campbell

**Puzzles of 'Enhancement'**

Intuitively, a distinction can be drawn between therapeutic and enhancing interventions. This distinction purports to mark an ethically relevant boundary, with technologies falling on the 'enhancement' side being especially ethically problematic. Roughly speaking, therapies are treatments which are designed to cure some pathological condition from which an individual suffers, returning them to normal functioning. Enhancements, on the other hand, are treatments that aim to improve a subject's characteristic beyond a normal range, or without reference to the correction of some pathology.

Broadly speaking, there are two ways in which debates over enhancement can proceed. On the first route, it is presumed that there is a coherent and value-neutral therapy/enhancement distinction. Disputes then turn over how (if at all) it should be factored into a publically acceptable ethical framework. On the second route, the very coherence of the distinction is called into question. It has been claimed that the difference between therapy/enhancement only encodes an ethically unjustifiable preference for the statistically or socially 'normal'.

My talk will focus on the second of these routes. I will attempt to provide a value-neutral characterisation of the therapy/enhancement distinction. To be fully successful, a definition in these terms must be acceptable to both proponents and opponents of the development and deployment of enhancement technologies. It must also provide a heuristic which can be used to settle, of some given new technology, on which side of the line it falls.

Wai-Yee Chan

**Genome Editing for Genetic Enhancement – Are We Ready Yet?**

New advances in genetic manipulation technologies bring us closer to the stage of altering the genome at will. The recent application of the genome-editing technique of employing the CRISP/Cas9 systems allows quick and efficient modification of DNA sequences in living cells resulting in correcting defective genes or introducing beneficial changes in normal genes. Aside from ethical issues brought about by this technology,
there are also a number of scientific questions that cast doubt on the readiness of the application of the technology. Efficiency of this and other genome-editing technology is not 100%. The consequence of the presence of a mixture of native and genome-edited cells on the health of individual developed from such embryo is unknown. Off-target mutations have been observed with the CRISP/Cas9 technology. Occurrence of such unwanted new mutation, in addition to the desired edit, could be detrimental. Recent advances in genome research have made it clear that phenotypic manifestation of a gene is not solely dependent on its primary structure but instead the results of epigenetic changes as well as its interaction with the environment. Thus, a number of ethical and scientific concerns have to be addressed before genome editing can be applied to humans.

Jack Chun

**Human Dignity and Genetic Enhancement**

Technology of the genetic enhancement has manifested the potentials to impact the development of human capacities in such diverse ways that some consider the technology as a possible threat to human dignity. The threat at issue assumes the cogency of the very concept of human dignity structured in a certain way and presupposes the concept as supervenient on a specific set of necessary and sufficient capacities or conditions definitive of the sense of humanity embedded in human dignity. In the paper, I argue that the question whether the genetic enhancement might encroach on human dignity is to a large extent dependent on how we frame the notion of human dignity, particularly on whether we are willing to see it as an elastic concept, capable of evolving in response to the changing environment and the development of technologies, the technology of genetic enhancement inclusive.

Alexandre Erler

**Who Stands to Benefit from Genetic Enhancement, and Why Does it Matter?**

The genetic enhancement (GE) of children might be pursued with a view to promoting the interests of various groups of people. Critics of GE like Michael Sandel have tended to focus on the parents, who may want to turn their children into “instruments of their ambition” or simply satisfy their own preferences for a particular type of child. However, it is worth stressing that GE can also be pursued to further the interests of the
child herself (what has been termed “procreative beneficence”) or of society as a whole (though specific segments of it, such as biotech companies, will of course have commercial interests at stake). Alternatively, the interests of the child and society have also been appealed to as an objection to GE. This talk will consider the normative force of these appeals to the expected impact of GE on the interests of these different groups (which can sometimes conflict) and, based on that analysis, will proceed to offer an ethical assessment of various prospective uses of GE, and to sketch some of its implications for regulation.

Mirko Garasic

**The Mechanization of Love**

In a series of articles, Brian Earp, Anders Sandberg and Julian Savulescu have identified a very specific ramification of the possible applications of enhancing biotechnologies: love drugs. I define this kind of enhancement as Emotional Enhancement (EE). EE has a number of peculiarities: not last, the fact that -differently from most forms of enhancement- *more* is not necessarily *better*. In line with this assertion, it has already been accepted by the same authors that diminishment might be in fact the answer to our problems in certain instances. Ultimately, EE wants to ensure the overall well-being of the individual, and thus -although deeply consequentialist in its core- the authors claim it to be not obsessed with absolute numbers *per se*. What counts is the impact that such biotechnologies can have in the overall life experience of the adult subject freely and competently choosing to undergo the procedure in question. I take issue with this way of conceptualizing and framing the impact that EE can have on our society through its entrance in our love relationships, and I propose introducing in the debate the definition of “mechanization of love” as a useful term to understand more clearly the dynamics in place.

Nancy Jecker

**Future People as Research Subjects: CRISPR-Cas9 Engineering of Human Germline Cells**

Gene editing holds extraordinary promise for basic scientific understanding of disease, clinical treatment, and human enhancement. Yet the practice of testing new gene editing techniques, such as CRISPR-Cas9, on human subjects raises far reaching and, in some
instances, unprecedented ethical challenges. Applying CRISPR-Cas9 to human germ-line cells would be ethically unique in several respects: the individuals that serve as research subjects would be future persons, some of whom would come into existence after we die; those who would give informed consent on their behalf would be their ancestors; and benefits and burdens resulting from this research would permanently alter human heredity. This paper addresses these striking features of research with CRISP-Cas9. My specific aims are to (1) point out the largescale impact of CRISPR-Cas9 method on research subjects; (2) identify justice principles to guide research with CRISPR-Cas9; and (3) propose that respect for human dignity that extends to all people is a cosmopolitan, rather than a merely local, moral value.

Hon-Lam Li

**Genetic Enhancement and Unfairness**
The practice of genetic enhancement cannot be adequately evaluated without considering it in the context of our particular socio-economic system, namely capitalism. In this paper, I consider whether genetic enhancement (in particular genetic editing) is fair or not if it is costly and only the wealthy can afford it. I argue that such “laissez-faire” genetic enhancement is indeed unfair and unjustifiable to those who cannot afford it. I further argue that laissez-faire enhancement would be easier to justify if utilitarianism were true. Contractualism is, however, a more plausible ethical approach than utilitarianism. Contractualism takes account of both consequences and deontological considerations (such as fairness). Nevertheless, just as private education is tolerable provided that public education is reasonably good, so laissez-faire enhancement might be tolerable provided that everyone has a legal right to state-funded “basic enhancement”.

Renzong Qiu and Xiaomei Zhai

**Human Genetic Enhancement: Arguments for and against - Ethical Perspectives**
We will first discuss the appropriate approach to such an issue as human enhancement which has special characteristics as uncertainty, ambiguity and transformative potentials. We will argue that there is moral significance to distinguish between human enhancement for medical and non-medical purpose as well as between somatic and germ life gene enhancement. We will critically examine the ethical arguments for and
against human enhancement. Finally we will reach our conclusion which may form the ethical basis for our policy to human enhancement.

Takeshi Sato

**What Ethical Approach is Effective in the Evaluation of Gene Enhancement?**

Recently, the Japanese government's Council for Science, Technology and Innovation published a report on genome editing of fertilized eggs. According to it, genome editing aiming for basic research is permissible under some conditions. This technology is currently in the “pre-basic” research phase, but soon will advance to the stage of developmental and applied research, at which point its use in treatment and enhancement will not be far away. In order to be prepared for the challenges this will pose, we need to evaluate the moral impact of genome editing before the age of full-scale gene enhancement is upon us.

There are, however, some difficulties in the morality of gene enhancement. These are mainly due to the fact that the fertilized egg seems not to be a person. The unclear status of the fertilized egg brings with it several familiar arguments in applied ethics. In this presentation, I will examine what ethical approach is effective in the evaluation of gene enhancement. I will conclude that we need some kind of meta-ethical perspective to engage with the ethics of gene enhancement, drawing a comparison with Hans Jonas, who needed metaphysics to develop his ethics of future generation.

Robert Sparrow

**People, progress, and products**

Genetic modification of human beings should be expected to lead to great inequality between generations. Improvements in the technology of human genetic modification will mean that each generation of modified children is likely to be born with significantly “better genes”. Foregrounding the social and technological dynamics that will produce intergenerational inequality lends renewed strength to criticisms of the project of human enhancement made by Michael Sandel and Juergen Habermas. Once it begins to make sense to talk of particular people having obsolete genes, it will be hard to avoid the thought that they have designers, and that this has implications for our ideas about the moral equality of persons. Conversely, foregrounding the ways in which our
sense of the meaning and worth of our own projects relies upon ideas about a human community that extends through time without too great a change in the nature of the individuals that comprise it may give us reasons to resist embarking upon the project of human genetic enhancement.

Huso Yi

Public Health Policy and Ethics Considerations of Genetic Engineering and Enhancement: Regulating Science versus its Products?

The question to genetic enhancement no more concerns ‘whether or not we can do’; but it now calls for an answer to ‘when we are allowed to and to what extent’. The question of ‘when and how far’ has been full of debates as the genetic engineering technology becomes more accessible (affordable widely not only by researchers but also by providers and consumers), simpler (lowering the threshold of expertise) and less risky (procedurally as far as the safety concerned) to perform.

Genetic engineering can be divided into various categories based on its purpose such as therapeutic vs. non-therapeutic, diagnostic vs. preventive or predictive, or somatic cells among adults vs. at the germ line level (engineered gene can be inherited). Non-medical enhancement and germline engineering are more to be concerned and restricted. While there are great potentials in advance of genetic engineering for cure of diseases and expansion of our genetic repertoire, there have been ethical considerations issues over human germline engineering, including ‘go against nature’, safety, unclear utility in phenotype enhancement, unequal access, unknown functions of genes engineered, informed consent from future generation, unjust society, discrimination by disability notions, burdens upon women and motherhood, and population-based eugenics.

The public health policy needs to be developed to guide all the genetic engineering in research and practice appropriately yet timely. There are different levels of policy adopted in genetic engineering, such as no regulation by libertarian views, ban on any germline engineering, restrictions on translational aspects of genetic engineering which implicitly prohibits related research, restriction or strategic public fund allocation on germline engineering in particular enhancement, ban on patent therefore decrease incentives in the research in particular in private sectors, and ban or restriction of access.
In the discussion of policy-making in genetic engineering, as stakeholders addressed, it is very difficult to establish proper regulation on the genetic technology of which effects and consequences are not known. Evidence-based health policymaking for public health sounds illogical in this matter. Creating a public health policy might be too late once a genetic technology is out in practice. Genetic engineering that is often developed in multiple countries in collaboration should reflect a locally best policy practice. Nevertheless, the ethical and social implications of genetic engineering also require empirical investigation to inform a local health policy.

There is confusion in health policy as its nature of being responsive. As noted, it might not provide ethical justifications in science development of genetic engineering. Rather, the policy can be better or only used in regulating the products out from genetic engineering. Policy should not regulate the science of genetic engineering yet it does as precaution.