ANALYSIS OF HUMAN ENHANCEMENT TECHNOLOGY: FROM THE PERSPECTIVE OF INFORMATION ETHICS

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Abstract: *While exploring the potential of human capability, the rapid development of human enhancement technology leads to ethical issues that need to be solved urgently, including technical security, autonomy, privacy, equity and the potential impact of technology on human nature. In this context, information ontology and information ethics provide a possible approach and build a systematic framework for the ethical issues of human enhancement technology. This paper attempts to interpret the essence of human enhancement technology with information ontology, that is, to enhance human capability through the process of information input, processing and output. Based on information ethics, this paper discusses the ethical issues of human enhancement technology in design and application. Information philosophy not only provides theoretical support for the dilemmas faced by human enhancement technology, but also gives reasonable and effective answers for the development of future technologies.*

Keywords: *Human Enhancement Technology; Information Ethics; Philosophy of Information*

ITHEA Keywords: *H.1.1 Systems and Information Theory; K.4.2 Social Issues*

DOI: *https://doi.org/10.54521/ijita32-01-p05*

Introduction

With the continuous development of science and technology, the possibility that human beings can enhance and become a "perfect" themselves by using technologies is gradually increasing. Upgrading human physiology and physics through technical ways may be able to break through the limitations of the past and bring new progress. At the same time, many problems such as safety,

ethics and equity arising from the application of technology also need to be addressed and taken seriously by science and technology. It is indispensable to reflect on philosophy and ethics for these emerging technologies that will irreversibly change the nature of human beings. Philosophy of information emphasizes information as the core of existence and advocates re-examining the essence and ethical significance of technology from the interactive relationship between information subject and environment. Therefore, from the perspective of information ethics, studying the ethical issues of human enhancement technology can not only deepen the understanding of technology itself, but also provide a more forward-looking ethical framework to deal with the social challenges brought about by technological development, so as to shape the appropriate optimal path for human and future technologies.

Human Enhancement Technology, Transhumanism and Posthumanism

Human enhancement technology refers to overcoming the current physiological limitations of human body through artificial means to enhance people's cognition, emotion, physical fitness, morality and other aspects and make human beings achieve overall progress. The report *Converging Technologies for Improving Human Performance* published in 2001 states: "If cognitive scientists can think of it, nano scientists can make it, biological scientists can use it, and information scientists can monitor it." [Roco, Bainbridge,2003] The rapid development of these emerging technologies has brought the possibility of enhancing human beings, which has also triggered the discussion on technologies and their applications.

In biological conservatives' opinions, "the human body is a balanced whole, which has been finely adjusted and is the product of a harsh and complex evolutionary process. ... The current situation is not perfect, but it is obviously satisfactory." [Buchanan, 2011] Contrarily, biological progressives optimistically believe that technological progress will have a positive impact on human beings. "The human body is not a 'balanced whole which has been finely adjusted' because evolution will not create a harmonious 'complete' creature. Instead, it produces a variety of transitional attempts and pieced together solutions for a temporary 'design' defect. ... seeking biomedical improvement is

not the pursuit of perfection, but only improvement.” [Ferry, 2017] For liberalism and technicism, biological progressives believe that it is irresponsible to prohibit human enhancement, but it is more necessary to control it.

The concept of super-humanism first appeared in 1957 and was put forward by biologist Sir Julian Sorell Huxley. With the progress of science and technology, it has been constantly given to improve its connotation. Nick Bostrom described the definition of transhumanism as "a possible and desirable knowledge and cultural movement that believes in fundamentally improving the human condition by applying rationality, especially by developing and widely applying technology to eliminate aging and greatly improve human intelligence, body and psychological ability. Study the impact of technology, the obligations undertaken and the potential dangers so that we can overcome the basic limitations of human beings and study the ethical issues involved in the development and use of such technologies. "[Bostrom, 2003] Transhumanism maintains a positive attitude towards technology, and regards technological improvement as the best means to perfect the real human beings, and as a bridge, the end point of its continuous evolution is post-human, and entering the post-human era may be the inevitable future of mankind. And ultimately lead to post-human. The relationship between the two may be as described by Luc Ferry. Transhumanism is a process or a path, and post-humanism is a goal and a result.

Posthumanism believe that human beings can transform and promote human genetic material and will spirit with the help of emerging science and technology, including NBIC technology, so that human evolution can be completely selected and realized through technology. This evolutionary process is similar to that of evolution from apes to adults, but the difference is in the power to assist evolution. The former is natural by natural selection, while the latter is human science and technology with certain initiative. As a representative figure who supports posthumanism, Max More divides the enhancement that posthumanism pursues into two categories: physical and spiritual. [More, 1994] To transform at the physical level is to improve the material part of human beings, mainly through genetic engineering and biotechnology. The spiritual transformation can also be achieved through neuroscience, computer

information and artificial intelligence, such as brain-computer interface technology. Under such a technical background, human beings may not be the same as today's human beings in essence, but exist as another species after human evolution. The future depicted by posthumanism is an ideal picture to promote the evolution of human physiology and intelligence through technology. "One day, we will have the opportunity to enhance our intelligence, physical fitness, emotion and spirit, far beyond what seems possible today. By then, we will step out of human childhood and enter the post-human era. " [Bostrom, 2005]

Ethical Risks of Human Enhancement Technology

In ancient Greece, ethics refers to customs and habits, which include social norms, conventions, laws and systems, as well as personal life and behavior, and it is a philosophical speculation based on morality. Therefore, the direct object of ethics is human beings and their related behavioral activities.

Actively or passively entering the era of rapid development of science and technology, from the safety risks carried by labor tools in the traditional industrial period to the ethical risks associated with contemporary science and technology, the scope of risks faced by human beings is constantly expanding with the change of technology types. To some extent, the improvement of human enhancement technology makes human subjectivity in human society be shared with the technology used to enhance human beings, which makes human beings, as the object of ethical investigation, no longer have the uniqueness of their subjectivity, and the infiltration of technology has become a key part of the object of investigation. With the increasingly close relationship between human physiology and science and technology, the concept of human being is deconstructed, its particularity and uniqueness will be dispelled, and people will continue to materialize and things will continue to humanize. [Zhang, 2020] The boundaries between people and things are constantly blurred, and human beings may be transformed into composite subjects with technology.

1. Security

The security of technology should be the most basic and primary issue in ethical investigation. Take gene editing technology as an example. First of all, the understanding of genes has not been fully studied, and the degree of cracking genes cannot ensure their accuracy and effectiveness in the process of gene editing. The off-target effect of gene editing and the subsequent mutations that are difficult to detect and cannot be avoided for the time being, and the changes made to human genes will have unpredictable and irreversible effects.

2. Autonomy

The opposition between reproductive rights and the independent choice of future generations is becoming more obvious. For parents, the willingness to use human enhancement technology to improve the capabilities of their offspring is obviously high, and whether such a choice destroys the autonomy of their offspring is another problem that need to be investigated urgently. Habermas believes that when parents have the freedom to choose their offspring's germ plasm according to their own preferences, such a choice is irresistible for children, which damages their freedom and self-determination. [Zhu, 2022] Thus, Luc Ferry responded that when the use of enhanced technology in human beings became a common reality, "not making a choice is also a choice, and not intervening is also a decision". Whether it is natural or historical, it is a basic condition, and it constitutes an environment for people to exercise autonomy. Whether this situation is chosen or not, it is and will always be an environment for people to exercise their autonomy. [Ferry, 2017]

3. Equity

Social equity can be divided into opportunity, process and result distribution. Firstly, the limited resources and the differences in reality will make the opportunities for social members to accept technology unequally. Secondly, the equity of the process depends to a great extent on its objects' understanding of the process. In addition, the equity of the results is crucial. The use of technology is bound to time lag. Compared with the people who have not received technological improvement, the people who have been enhanced first gain more advantages, so that they can maintain a favorable position in the

competition of all human beings, which will obviously lead to the collapse of social equity.

The Response of Information Ethics to the Dilemma

On the premise of emphasizing information as the basic form of existence, Floridi' s information ethics advocates that all beings should be regarded as the subject of information and given basic moral status. This provides an effective theoretical support for human enhancement technology, that is, the core of technology lies in the collection, processing and feedback of information, which redefines the interactive relationship between human beings and technology by expanding human perception and enhancing human capabilities.

1. Ethical Norms of Technical Design

In information ethics, Floridi introduced the concept of entropy, and put forward four core ethical norms centering on information good and evil. [Floridi, 2018] This ethics framework can provide references and supports for the design of human enhancement technology. For example, the core of brain-computer interface technology is to convert users' neural signals into operable digital information, and the data collection and processing in this conversion process follow the requirement of "reducing information loss", thus ensuring the reliability and moral legitimacy of the technology.

2. Morality and Rights of Subject

Floridi put forward "distributed morality", that is, the distribution of moral responsibility is no longer limited to a single subject, but covers all the actors involved. [Floridi, 2018] Distributed ethics contains the multi-agent interactive network of technical designers, data processing systems, users and external environment.

As an inherent right of human beings, human rights need to be guaranteed, and this right to make people human rather than tools is the premise of technology implementation. It is possible for human beings to gain more capabilities and possibilities through technology, but in its clinical implementation, the recipient

should be voluntary and comprehend all potential risks, and individual information needs to be respected and kept confidential.

3. Privacy

Floridi emphasized the importance of information privacy, that is, "the freedom of information subject from information interference and infringement can be achieved by limiting its information disclosure, which is unknown and unknowable", and he advocated respecting the information subject's right to know and control in the process of data generation, storage and circulation. [Floridi, 2016] The erosion of personal privacy by technical equipment in the implementation has become the primary problem. Therefore, the technology implementation should be based on transparency and autonomy to ensure that users have full control over their personal information.

Conclusion

Nowadays, the development of science and technology is in an irreversible trend. In order to survive in such a highly technical society with a deepening degree of man-machine integration, it is very important to clarify the role that people play in it and the interaction with technological development. That is to say, human beings need to be paid attention to and should not be eliminated in the continuous upgrading of the relationship between science and technology and human beings.

Based on the theoretical perspective of information ethics, this paper systematically discusses the key ethical issues in the development of human enhanced technology. The research shows that the theory of information subjectivity provides an important basis for maintaining human's ontological status. The distributed moral framework breaks through the limitations of traditional ethics and provides adaptive ethical guidelines for the application of emerging technologies. The concept of global information ecology promotes ethical considerations to the level of the community of human destiny and provides a more macro perspective for technological governance. At present, there are still some problems to be discussed in depth, including the fairness in the use of human enhancement technology mentioned in the paper,

intergenerational ethical considerations, and the establishment of cross-cultural ethical consensus. The next step needs to deepen the understanding of information subjectivity, explore the applicability of technical ethics in a wider range of scenarios, and further enrich the theoretical connotation of global information ecology. At the same time, the research should adhere to the position of paying equal attention to criticism and construction, actively explore the benign development paradigm of man-machine cooperation while maintaining the tension of technical criticism, and finally realize the dynamic balance between man and technology.

Bibliography

[Roco, Bainbridge,2003] M. C. Roco, W. S. Bainbridge. Converging Technologies for Improving Human Performance. Kluwer Academic Publishers, 2003, p.13.

[Ferry, 2017] Luc Ferry. La Révolution Transhumaniste. Human Science and Technology Press, 2017.

[Bostrom, 2003] Nick Bostrom. The Transhumanist FAQ, Published by the WTA, 2003, p.4.

[More, 1994] Max More. On Becoming Posthuman. Free Inquiry, 1994(4).

[Bostrom, 2005] Nick Bostrom. In Defense of Posthuman Dignity, Bioethics, 2005, 19(3), p.202.

[Zhang, 2020] Can Zhang, Meet the Challenge of Human Enhancement Technology. Chian Social Science Today, 2020, 1956.

[Buchanan, 2011] Allen Buchanan. A Beyond Humanity? The Ethics of Biomedical Enhancement. Oxford University Press, 2011, p.21.

[Zhu, 2022] Yanming Zhu. Habermas' Criticism of Free Eugenics and Its Limitations. Journal of Dialectics of Nature, 2022, 44(01), p.69-77.

[Floridi, 2018] Luciano Floridi. The Ethics of Information. Shanghai Translation Publishing House, 2018.

[Floridi, 2016] Luciano Floridi. The 4th Revolution: How the Infosphere is Reshaping Human Reality. Zhejiang People's Publishing House, 2016, p.121.

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