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Transhumanism and Sport

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Abstract

With the addition of today's developing science and technology opportunities to human's efforts in the historical process to live a longer life without disease, Transhumanism has jumped one more dimension and has taken its place in many branches of science today. Since transhumanism is a trend that mainly concerns the mind and body of the human being, its influence in the humanity is great. Sports science is also included in these discussions because it basically involves the human being. In this respect, technological developments and advances in recent years have brought new discussions in the field of sports as they emerge as a factor that helps human life and makes life easier. In this literature review study, the interaction of technology and human beings and its reflections on sports is scanned and it is tried to examine whether Transhumanism is an opportunity or a threat to sports. In this direction, studies in the field of Transhumanism were scanned and was discussed in terms of the advantage, disadvantage, opportunity or threat with the introduction of new technologies into human life. It was concluded that transhumanism studies can move the sport organizations to different dimensions, but can pose a threat to today's sports and athletes if the necessary precautions are not taken in time.

Keywords: Transhumanism, H +, Humanity +, Technology, Sport,

Introductıon

In the historical timeline and especially in the last century, humanity has made an incredible breakthrough in the field of technology. These developments have also triggered the studies for a longer and quality life of humans. More superior, disease-free and qualified human life studies have begun to be examined under the title of Transhumanism. The studies carried out in this direction have taken their place in many disciplines. Today, the researches that concern human being inevitably undergo transformation in the light of these developments and reveal new progresses. In the near future Transhumanism will affect many other sectors in the economic structure, and it will be also inevitable its affect on many branches of science that concern humanity and its nature, such as Medicine, Philosophy, Religion, Sociology and Sport. Any kind of work aimed to increasing the physical and cognitive abilities of human beings will undoubtedly have positive and negative contributions expected to the sports and its sector. Since the sports sector basically involves humans, it is predicted that sport and its surround will be influenced and transformed by Transhumanism trend. It is undoubtedly important to be able to predict the place of Transhumanism in the future of sports, which topic will shapes the future. With this study, it is important to examine the possible reflections, advantages and disadvantages of Transhumanism studies on sports and its industry in terms of shedding light on the future of today's sports.

Sports can be an individual activity for people to stay healthy and fit, as well as a platform of local competition or area that includes national interests, such as the Olympics Games, where countries will want to be active always. This is why Transhumanism studies concern the world of sports and the sports industry in all respects. Questions such as whether the Olympics Games and Championships, where international competition is at the highest point, will be followed with the same enthusiasm in the future, how such organizations will be affected by Transhumanism studies, come to the fore. Also: Is there a possibility that the known ethical rules, will be affected from transhumanism studies? What are the possibilities of intervention on human by transhumanism studies? Does the intervention on human, hence the athlete, threaten the sport in the known classical sense? What does Transhumanism promise in general? What are the current fields of study and its effects on the sports world? By searching answers to such questions, our study aims to gain a different perspective on the future of the sports and its agenda.

With this theoretical study, the current developments in the field of Transhumanism were discussed and the reflections of these developments on sports, which mainly concern human, were tried to be presented. Considering essentialy the fact that success and progress in sports are achieved within the time frame and great efforts, the reflections of Transhumanism studies in the field of sports were examined and its advantages and disadvantages have been tried to be evaluated. With the present research, it is aimed to take attention to the opportunities and threats that may arise with the developments of Transhumanism researches in the future of sport, to take place and contribute the developments in sports science literature.

Conceptual Framework

The Emergence and Definition of Transhumanism

It can be said that the emergence of the philosophy of transhumanism and its studies in the historical process, is basically a stage of the development of the philosophy of Humanism. Kadıoğlu (2011) defined Humanism as; the idea of a mental and philosophical movement aiming the development of basic qualities in human beings. As for Akkaya (1947); He has

defined this movement, which has an unprecedented high value in the history of culture, as the expression of the movment that observes the growth of human beings in a perfect way and reach the ideal humanity as an individual. The writers of the XV. century used this word "Humanitas" in classical Latin to mean spiritual maturation. German scientists, for the first time in the XIX. century, they used the word Humanist in the form of Humanismus (Humanism) in the sense of spiritual-intellectual movement (Akkaya, 1947). The serious attempt to theorize human nature started in the Renaissance and the concept called "Transhumanism" was mentioned for the first time at this time. However, to be more precise, any understanding of humanism in the Renaissance was also accepted as "Transhumanism". This idea was expressed in Giovanni Pico della Mirandola's "Speech on Human Dignity" (Brumlik, 2016: 121).

The earliest works in the field of transhumanism belong to Haldane (1924) and Bernal (1929). Contemporary concepts of Transhumanism were first included in the article "Daedalus: Science and the Future" by the British geneticist Haldane (1924). Although initially seemed "immoral and unnatural" to most people, he advocated the benefits of eugenics, ectogenesis, and genetic engineering. Subsequently, Bernal's (1929) article "The World, Flesh and the Devil" aroused more interest with his discovery of the possibilities of change, arguing that it would be possible to determine human physical and mental characteristics through bionic implants and cognitive enhancement. As the term "Transhumanism" containing the meaning used today, was introduced in an article written by biologist Julian Huxley in 1957. Here he claimed that, if the human beings wished it could transcend itself, Transhumanism would leave man as human, but man could surpass himself by becoming aware of his nature and new possibilities (Huxley, 1968).

Today, there are many definitions explaining the concept of Transhumanism. Max More (2010), a "philosopher and futurist", defined Transhumanism as a philosophical and cultural movement that explores the profound improvement and desirability of the human condition through science and technology. Transhumanists claim that, guided by life-promoting principles and values through science and technology, they investigate the evolution of intelligent life beyond and accelerate the current human form and human limitations (More, 2010). According to Natasha Vita More, "Transhumanism is a commitment to overcoming human boundaries in all its forms, including extending life expectancy, increasing intelligence, constantly advancing knowledge, gaining complete control over our personalities and identities, and gaining the ability to leave the planet. According to Mitch Porter, Transhumanism is the doctrine that we can and should be more than human (Anissimov, 2015). Pepperell (2003) adopts a different philosophical approach and defines Transhumanism as the "superhuman state", expressed as "the end of the human-centered universe", "an energetic theory of mind in which human thought, meaning and memory are understood in terms of the activity of an energy regulating system". For Pepperell, Transhumanism has been expressed as the end of Humanism, that is the end of "belief in the infallibility, superiority and uniqueness of human power for a long time". Anissimov (2015) defined Transhumanists as thinkers who believe that one day cybernetic developments will be powerful, elegant and cheap, and that everyone will want to access them. Undoubtedly there are many scientists working in this field and it is possible to expand the definitions of Transhumanism. To repeat this definition, it is a philosophy of life that seeks to move beyond the current human form and human limitations, way to accelerate the evolution of intelligent life through science and technology, guided by the principles and values that encourage life. It

would be suitable to emphasize Transhumanism, which goes beyond the natural mind and body structure of the human, by defining it briefly as "Transition to the artificial human form".

Figure 1. The evolution of transhuman-humanity. (Evolution, 2021)

While scientific and technological progress continues uninterruptedly towards the future, the philosophy of humanism in this direction aims the endless development of human beings. Transhumanist philosophy, since it was built on the basis of science and technological developments, defends these two concepts anyway in order to achieve its goals.

In 2009, the "Transhumanist Declaration" was published under the leadership of transhumanist scientists who are experts in their fields. The same declaration was accepted by the General Assembly of Humanity^{+} (H +) organization in March 2009, after a few changes. Transhumanist Statement (Mazan, 2015; 10) briefly:

1. Humanity will be deeply affected by science and technology in the future. We envision the possibility of expanding human potential by overcoming aging, cognitive deficits, involuntary suffering, and our being confined to planet Earth.

2. We believe that humanity's potential is still largely unrealized. There are possible scenarios that lead to wonderful and extremely valuable improved human conditions.

3. We are aware that humanity faces serious risks, especially due to the misuse of new technologies. There are possible realistic scenarios that lead to the loss of most or even all of what we hold valuable. Some of these scenarios are harsh, others subtle. Although all progress is change, not all change is progress.

4. Research efforts should be made to understand these expectations. We need to think carefully about how best to reduce risks and accelerate useful practices. We also need forums where people can constructively discuss what should be done and a social order where responsible decisions can be enforced.

5. Developing tools for reducing existential risks and protecting life and health, alleviating serious suffering and improving human foresight and wisdom should be pursued and heavily financed as immediate priorities.

6. Policy-making should be guided by a responsible and inclusive moral vision that takes both opportunities and risks seriously, respecting autonomy and individual rights, and showing solidarity and concern with the interests and dignity of all people around the world. We must also take into account our moral responsibilities to future generations.

7. We advocate the welfare of all sensibility, including humans, non-human animals, and future artificial intelligence, altered life forms, or other intelligences that can be driven by technological and scientific progress.

8. We support allowing individuals to make a wide personal choice about how to activate their lives. This includes the use of techniques that can be developed to aid memory, concentration and mental energy; life extension therapies; reproductive selection technologies; cryonic procedures; and many other possible human modification and improvement technologies.

As can be seen from the declaration of the Humanity+ community; active life is adorned with concepts that affect people such as welfare, rights, and moral responsibilities. However, it appears as a statement supporting human modification processes. Therefore, it is inevitable that all humanities, such as sports and sports sciences, that concern human, find themselves in the platform of scientific and philosophical discussion of Transhumanism.

Humanity has gone through various stages throughout history and these processes are still continuing. Philosophical currents ranging from Humanism to Transhumanism above have brought humanity on the eve of important developments. Humankind has now been discussing the post-human dimensions. Undoubtedly, every new development on man and humanity will cause social and economic repercussions. In order to understand the possible effects on the sport dimension, it would be appropriate to examine the studies related to Transhumanism today.

Transhismism Studies and Reflections on Sports

As in sports, humans are at the center of Transhumanism studies. Sports, due to its competitive nature, deals with the physical and mental development of people. The philosophy of transhumanism likewise involves the physical and mental development of human beings with the contributions of various technologies. In this regard, it is quite possible that both concepts will be affected by developments from similar fields. Although both concepts produce arguments in the same direction on human development, Sport and Transhumanism differ from each other on some moral points. The opinion that sports emerges in natural development and Transhumanism deals with artificial development, sometimes there are some points where natural and artificial technologies intersect and cannot be distinguished. At this point, scientific and technological developments lead to moral debates on Sport.

In this context, by briefly examining the scientific and technological developments that allow human beings to develop artificially, the intersection and divergence points of Sport and Transhumanism will be better understood. On the one hand, in the direction of Transhumanism, the connection of current technological developments with sports will be examined, on the other hand, the effect of possible future technological developments on sports will be evaluated. Scientific and technological studies that enable human development are:

Doping

The use of various substances or methods to increase physical and / or mental performance is called Doping (Unal & Unal-Ozer, 2003; Ertin & Bardakçı, 2020). Or according to the more detailed description; Giving a foreign agent to the organism (by whatever means) or applying physiological substances to a person in abnormal amounts during or outside the competition

in order to increase the performance artificially and irregularly, are considered as doping (Unal & Unal-Ozer, 2003: 189).

There is a wide variety of performance enhancing agents and methods, and these become increasingly diverse, sophisticated and ingenious, in line with scientific advances. Doping in sport is the use of prohibited substances or methods to enhance an athlete's performance, and hiding or trying to hide such use. These substances and methods have been banned for use in sports by the World Anti-Doping Agency (WADA) by various regulations. The most used doping types and species are (Çınar et al.2010; Unal & Unal-Ozer, 2003):

Stimulants: The effect of these substances is to delay fatigue by stimulating the central nervous system. Forcing the organism to use its reserves. Amphetamine, Methylphenidate, Caffeine, Cocaine, Ephedrine, Sibutramine, Strychnine, Pemoline or Modafinil are among the stimulants used by athletes. Stimulants are known to increase endurance and anaerobic performance, reduce the feeling of fatigue, increase attention and cause weight loss (Ertin & Bardakçı, 2020).

Narcotic Analgesics: The use as painkillers of morphine and morphine's chemical and pharmacological analogues (Çınar et al. 2010).

Anabolic Steroids: Drugs that show testosterone (essential male hormones) effects in the body. Steroids mostly affect the muscles, giving them strength and increasing their length and width (Çınar et al. 2010).

Growth hormones: This hormone, also known as somatotropin or somatotropic hormone, stimulates the liver and other tissues and provides muscle and organ growth. In this way, sports performance increases (Çınar et al. 2010).

Erythropoietin (EPO): Thanks to a drug developed for the treatment of anemia in kidney patients, red blood cells begin to carry more oxygen. Thus, the person becomes more durable. Among the names involved in the doping event realized through the use of the synthesis of this hormone, there are world-famous athletes who have competing in the cycling and triathlon branches (Aschwanden, 2000). However, it should be noted that some athletes do not need to use synthetic EPO, even if it is a very small number. For example, the famous ski athlete Eero Antero Mäntyranta, who has packed seven Olympic medals in his career, was born with a genetic mutation that increases the oxygen-carrying capacity of red blood cells by 25-50%. (Aschwanden, 2000). This congenital discomfort has given him an advantage in competitions that require endurance.

Blood doping: This is the method of transfering the athlete blood, himself or someone else, belonging to the high performance period, to the body after being cooled or frozen (Unal & Unal-Ozer, 2003).

Brain Doping (Nootropic Drugs or Intelligence Enhancers): Cognitive enhancers can be defined as the use of drugs and / or other tools aimed to improving the cognitive functions of healthy subjects, especially memory, attention, creativity and intelligence (designed as problem solving ability) (Fratil et al., 2015).

Gene Doping: Within the framework of the "Genome Project", the genetic codes of many diseases have been analyzed and the chance to be treated with "Gene Therapy" has arisen. Some of the treatments determined in parallel with these developments in the field of genetics, molecular biology and medicine, show performance enhancing effects. Gene therapy involves the delivery of the artificial gene to the patient. The artificial gene that is given provides the synthesis of the appropriate protein by creating a suitable RNA in the cell. In this

method; Gene doping can be performed in the form of 1- direct injection of DNA into the muscle, 2- delivery of genetically modified cells, and 3- virus delivery. Erythropoietin (EPO) gene, IGF-1 gene, Myostatin gene, VEGF gene and Leptin gene constitute examples of potential gene doping. (Unal & Unal-Ozer, 2003).

Neuroprotective

As it is known, the nervous system coordinates all the activities of the body and adapts the organism to the situation or environment it is in. The coordination and intensity of sports exercises are also performed depending on the functioning of the athlete's nervous systems. The general nervous systems of complex organisms are mainly composed of nerve cells. Shortly after birth, nerve cells in mammals lose their dividing power and are unable to regenerate. However, in many experimental studies conducted today, in this process from disease to death, especially retinal ganglion cells can be determined anatomically and morphologically; This process has also been reversed with potential neuroprotective agents. The theoretical possibility that retinal ganglion cells can be saved before they die completely has further increased the interest in this issue. In this context, the protection of ganglion cells and neurons under ischemic stress is called neuroprotection (Nerve Protection). The aim of neuron-sparing therapy is to stop the chain leading to death with a series of sequential reactions starting with the triggering of ischemia, and to ensure the continuation of cell life. Theoharides et al. (2016) found that some Autism spectrum disorders (ASD) respond to treatment modalities provided by neuroprotectants. Today, apoptosis inhibition, anti-oxidants, mitochondrial regulators, anti-excitotoxic agents, neurotrophic factors, Ca-channel blockers, stem cell transplantation and gene therapy are current issues in neuron protection (Ozcan, 2021). The possibility of specific nano-sized neuroprotective agents for certain targets to circulate in our blood in the near future is increasing day by day. These applications can undoubtedly increase the athlete's senses by optimizing the functionality of the nervous system. However, the ethical situation regarding the application of these methods in sports is the duty of the World Anti-Doping Agency (WADA), as we have mentioned above.

Exoskeleton

The exoskeleton is an external mechanical skeleton containing various components (routers, digital system, battery). Whose function is similar to that of bones. Exoskeletons are the blessings of today's technology that imitate the whole body, lower limbs, upper limbs or just the hand of humans. They are designs that apply electric force like muscles to support, activate or block the positions of human joints. In these systems, there is also a digital control system that calculates the power ratios to be made according to the desired applications (Ganier et al., 2018). For this reason, they are also called exoskeleton robots. These structures are wearable electromechanical structures that work in interaction with human limbs. These robots are used for auxiliary limb in people with walking disability or elderly people, rehabilitation in paralyzed people and power increase in healthy people. In coordination with the nervous-muscular system of the human body, it continuously changes the stiffness and damping of the joints to which they are connected, providing a flexible and stable movement ability with minimum energy consumption (Demiray, Başer & Kilic, 2015). Today, the use of structures such as exoskeleton in sports activities has not yet been used, but in order to ensure the mobility of athletes, helpers with some standards (wheelchairs, prosthetic arms or legs, etc.) are used. As a matter of fact, Paralympic Games have been held since 1960, just like the Olympics, in which the disabled have been competing. It is held in summer and winter periods and the ongoing Paralympic Games are held today in a total of 28 sports branches, 22

of which are summer and 6 of which are winter sports branches. Some of the Summer Games sports include weight lifting, athletics, wheelchair basketball, volleyball, rugby, fencing, shooting, diving, while the Winter Games include sports such as Alpine skiing, ski running, wheelchair curling, sledding (Girişmen & Gurkan, 2018).

Figure 2. Paralympic sports. (Girişmen & Gürkan, 2018)

Today, the company named Ossürs has designed a multi-joint myoelectric hand with the "i-limb Quantum" project, which allows the artificial limb to be controlled with smart mobile devices. The natural movements of the hand were able to be produced with titanium fingers that increase the carrying load by 50%, grip strength by 30% and movement speed by 30% in order to increase power and functionality (Ossürs, 2021).

The rapidly developing technology today is expected to take the Paralympic games even further. Developing technology is rapidly advancing people to many goals, that could not reach before. Continuing scientific and technological studies in the field of exoskeleton gain qualifications that can respond to the more severely disabled situations of human beings.

Artificial organs

Today, the vital organs that have possibility of artificial organ transplantation or are expected to be artificially produced in the near future are kidney, heart, lung, liver and pancreas. Today, artificial organs can generally meet some of the functions of natural organs. Artificial organ is an organ produced by mechanical materials or tissue engineering, designed to restore some or all of the functions of the organs that have lost their functionality and vitality. Failure of any vital organs leads to the death of the patient in cases where the functions of this organ are not restored. For saving human life today organ transplantation is provided either from another human or with a man-made artificial organ. Artificial organs have been routinely transplanted to approximately 40 different parts of the human body for the last 30 years (Özcan, 2020). The artificial organ was first used in 1966 by M. DeBakey by connecting a simple pump that supports the function of the left ventricle of a dying patient (Liotta, 2012). Today, Akipek (2019) stated that an artificial heart project is working with the principle of magnetic fluids without any contact with blood is being carried out, and that they have designed a smaller, longer-lasting, non-corrosive system that does not harm the structure of the blood. Akipek (2019) also stated that in studies on the production of artificial organs using the patient's own cells can be reproduced by 3D printers and produced artificial organs with living tissue are

fully compatible with the patient. He stated that they carried out working on a system that prevents cell loss during the use of bioprinters in this field.

As can be seen, scientists carry out very important studies on artificial organs in order to prolong human life and quality. However, studies in this area have not yet become advanced and scientists are still working on them intensively. As a matter of fact, if the developments in the field of artificial organs had advanced, world-renowned athletes such as Naim Süleymanoğlu (50), whom we lost at a young age as a result of liver failure and complications, and Diego Armando Maradona (60), who suffered from lung and heart problems, could still be among us.

Cryonics

According to the American Heritage Medical Dictionary (2007), Freezing is defined as: "The process of freezing the body of a person who has an illness or recently died to prevent decomposition and thus to return to life in the future with the development of new medical treatments." Although it has been gone 67 years since Andjius and Lovelock (1955) managed to resuscitate mice frozen at 0 ° C using the microwave diathermy method in 1954, human freezing was completed in this area, but revitalization was not yet achieved. James Hiram Bedford (April 20, 1893 - January 12, 1967), who was a professor of psychology at the University of California, was the first person to allow his body "frozen" after his death (Perry, 2017; 35).

Since freezing is not yet proven or recognized medical procedure, legal death must be reported before freezing procedures can begin. After dead, in the early stages, the subject's circulation and respiration are mechanically restored, after is given preventive drugs the subject is rapidly cooled between 10 ° C and 0 ° C. A significant amount of body water is replaced with a cryoprotectant mixture to prevent the blood ice formation of the subject. Subject is cooled to a temperature below -120 ° C and kept in cryostasis. Whenever in the future the drug has this capability, the subject will be reheated, the cryoprotectant will be removed, the tissues will be repaired, diseases will be treated, and (if necessary) the subject will be rejuvenated (Best, 2008).

Today, there are several companies in the world, that provide freezing services for people to be resurrected someday in the future. Various services are provided in these cryonics centers to freeze only the head, whole body or animals. Among these companies serving around the World are: Alcor Life Extension Foundation (USA - Arizona), American Cryonics Society (USA - California), Cryonics Institute (USA - Michigan), Trans Time (USA - California), KrioRus (Russia - Moscow) and Vacree Technologies (China-Hefei) centers. More than 400 people around the world are now frozen in these centers and are waiting to be awakened in the future (Jie et al., 2021). During our study, it was not found an information about a known athlete in these centers.

Gene Engineering

Genetic engineering, which started with J. Watson and F. Crick's explanation of the double helix structure of DNA (Deoxyribonucleic Acid) in 1953 and when S. Kochan and H. Boyer performed DNA transfer to bacteria with genetic engineering works in 1973, has start directing our lives very effectively and quickly in the 21st century. Genetic engineering, also known as genetic modification, is a process of manipulating the genetic material of organisms using biotechnology (Demir, 2013). This may involve generating an entirely new DNA

sequence and modifying the organism's DNA, or applying methods to "silence" or "switch on" genes. The first product of the modifications tested was bacteria produced in 1973. The process continued in 1982 with discussions of insulin-producing bacteria and Genetically Modified Organisms (GMO) in agriculture, eventually it was expected to attract public attention to playing with human DNA. With the completion of the mapping of the human genome on April 14, 2003, the accelerated studies were pointing to a different future. As a result, the year was 1990 when the first gene therapy tried on human beings emerged (Aşkın, 2015). By the year 2007, it was revealed by the American scientist Richard Hanson and his team (2007) that transgenetic mice with the PEPCK-C enzyme, whose muscles were intensely increased by genetic modification, were 7 times more mobile and lived longer than ordinary mice. In addition, on the treadmill, control rats ran 0.2 km with a 20m / min running, while transgenetic mice could run more than 6 km (Hakimi, 2007). By March 2015, in a study conducted on monkeys, all animals became immune to HIV thanks to a recombinant gene added to monkey DNA (Gardner et al., 2015). In the same year, when Chinese researchers first edited the genes of a human embryo, this led to a global response from scientists to not make a baby using technology, at least for now (Regalado, 2018). However, by 2018, Chinese biophysicist He Jiankui and his team used the CRISPR technique (gene editing technology to mutate the DNA of human embryos) to make human embryos resistant to HIV infection (Cyranoski, 2018; Greely, 2019). We know nothing about different mutations twins named Lulu and Nana, that they have produced. Unlike genetic gene editing protocols in somatic cells, the gene editing protocol used to create these twins is predicted to make a permanent change in the line of inheritance that can be passed on to future generations (Singh, 2019). While the discussions on ethical and legal status in the field of genetic engineering continue, the births of Lulu and Nana have crossed the boundaries of the genomic revolution. With genetically modified and designed babies there is no obstacle for future generations to steer sports as at the many other fields. Perhaps today, designed dolls that will achieve various successes in sports are among us.

We have to underline that, gene doping involves the modification or addition of genes to existing genes only to improve performance in healthy people, while gene therapy refers to the manipulation of genes to prevent or treat a disease. While genetic enhancement in sports is currently possible at the somatic cell level, especially in recent years, the development of the CRISPR / Cas9 technique has opened the way to make changes in the germ line in a much cheaper and practical way (Brown, 2019).

Neural computer interface (NCI)

Berger in 1929 demonstrated the possibility of recording brain waves from an intact skull. Since then, a tremendous amount of brainwave data has been collected by neurophysiologists covering a variety of conditions, and in recent years, computers have been used extensively for analysis (Vidal, 1973). Neural-Computer İnterfaces are sometimes called the Mind-Machine İnterface (MMI), Brain-Machine İnterface (BMI), Direct Neural İnterface (DNI), or Neural Control İnterface (NCI) and as an external device Brain-Computer İnterface (BCI).

NCI are generally intended to increase, research, map, assist or restore human cognitive or sensory motor functions. Neurobiologists identify and manipulate components of the intracellular and extracellular environment to alter the regenerative potential of neurons, neuroengineers produce brain machines and neural interfaces that inhibit lesions to restore functionality, and neurorehabilitation specialists try to stimulate the nervous system even in chronic diseases (Krucoff et al., 2016).

As a result of the clinical studies of the Brain Computer Interface project, published on October 4, 2019 in the journal "The Lancet Neurology" and carried out in Clinatec (CEA, CHU Grenoble Alpes), the pilot concept of an exoskeleton with 4 specific limbs has been confirmed. For the first time, a paralyzed patient was able to move and control two upper limbs using a neuroprosthesis that collects, transmits, and decodes brain signals in real time to control an exoskeleton. With this technology, it is aimed to provide people with mobility impairments more mobility in the long term (Benabid et al, 2019). As seen, researches are intertwined and the exoskeletons can now be controlled by neurocomputers.

Figure 3. Representation of the Clinatec exoskeleton (Treillet, 2021).

According to Folacci & Baudin (2019), it is the first time that an integrated neural network was created on a chip and it was named Spirit. Powered for large computations at low power and latency, this integrated neural network on this chip is largely inspired by the functioning of the brain. Just like "real" neurons, Spirit uses single encoding (as opposed to binary encoding often used in digital electronics). Each event contributes to the gravity of the relationship between two neurons up to an impulse threshold. Another similarity with biology: resilient and ultra-fast memories as well as low energy consumption. Spirit, the first step towards dedicated chips to built-in "deep learning" solutions, combines performance and low energy consumption. Next step: a new Spirit version in 28 nm technology (Folacci & Baudin, 2019).

Neural computer interface studies open quite fictional doors such as the integration of living things with artificial intelligence. Maybe the doors are opening to human-controlled robot sports games, who knows? However, one of these gates is undoubtedly the Exocortex studies, and by going here to the work areas for Loading and Downloading Consciousness, another dimension beyond imagination is entering.

Exocortex (External-mind)

According to the Chemeurope encyclopedia (2021), the exocortex is consisted of two latin origin addings: the prefix exo-extrinsic or external - the main root noun cortex - initially means shell, but in the context of neuroscience it is the most advanced cognitive information processing area of the brain similar to the outer shell, and this refers to the layer. Therefore, based on component morphology, the term exocortex (external-mind) refers to a region outside, the cortex of the brain. An exocortex is an external information processing system that enhances the biological high-level cognitive processes of the brain. In other words, the external-mind (exocortex) is a hypothetical artificial information processing system that will increase the biological cognitive processes of the brain (Wordsense, 2021).

Uploading and downloading consciousness

Hypothetical technologies in this field

• Mind loading (“brain loading” or “whole brain emulation”, “mind copying”, “mind transferring”,…) (Sandberg & Bostrom, 2008).

Mind fusion (scenarios connecting more than one brain to the same outer cortex) (Sotala & Valpola, 2012)

• External cognition interface (strengthening the human neocortex with nerve prostheses and connecting to the outer cortex with a quantum physics-based connection) (Dambrot, 2016)

Because of the brain's flexibility, it is easier to build a brain-computer system than to create a full-fledged artificial intelligence from scratch. Such a device, not only helps to understand what consciousness is and upload it to a computer, but it can also unite the minds of several people. One of the developments in these areas is the device developed by Neuralink, founded by Mask (2019). Neuralink can analyze the information coming from the electrical messages of a region of the brain with electrodes connected to strings thinner than hair (Musk, 2019). Therefore, the electrical data of our brain started to be decoded, read and transferred to the computer. According to Elon Musk; with this technology, a complete brain-machine interface can be built and a kind of common life can be achieved with artificial intelligence. He declare that, the chip will communicate wirelessly with a headset that transmits information to a smartphone app. For now, the goal is to allow a person with implants to control the smartphone by thinking, but the technology could eventually spread to other devices such as robotic arms. Declaring that we will fall behind artificial intelligence even in a benign scenario, Musk stated that the chip will be tested on a sick person in the coming period. Thus, he emphasized that we can actually go on a journey with a high-bandwidth brain-machine interface (BMI) and we have the option to combine with artificial intelligence (AFP, 2019).

As you can see, an exoskeleton that can be controlled by the human brain has been produced, furthermore, a chip acting as a natural nerve cell has been developed. In the project like Neuralink, the development here has progressed in two directions. The natural nerves were enabled to give commands to the computer, and the computer-aided artificial intelligence interacted with the natural nerves, paving the way for symbiosis. It can be said that in the near future all will be quite different and we are at an important crossroads which include human and its social life.

Dıscussıon and Conclusıon

Every development that concerns human beings and its nature undoubtedly directly affects the world of sports. In this study, the scientific developments in the field of Transhumanism have been tried to be reconciled with the sports title. A new development and progress is being made every day in scientific centers around the world. In this respect, it is essential for the continuity of sports to know, examine and present predictions of Transhumanism studies which are the subject of our study. Transhumanism studies are concerned with the preservation of life by providing artificial organs for long life expectancy, from one side struggling against diseases, injuries and disabilities with genetic intervention, on the other side moving human beings into the future by deep-freezing (cryonics). Transhumanism is trying to transfer consciousness to machines, to multiple consciousness, to find a way for symbiosis with machines and immortality. Therefore, when you envision the developments

recorded on the basis of transhumanism in terms of today's sports, the possibility of encountering a sports picture in a different dimension becomes stronger.

As a result of developments in biotechnology, nanotechnology and genetics, we have entered an age where it is possible to equip the human body with superhuman abilities by pushing the limits of the human body beyond traditional doping methods. Genetic development through gene therapy or doping agents that can be sent to the body through nanotechnology or prostheses that can function beyond the normal limits of humans, are among the most discussed topics today (Ertin & Bardakçı, 2020). Regardless of which side we looks at, there is an intervention in human nature and this situation will shake the entire balance of our current world. In this respect, we can say that sports and humanity are on the eve of a great change. The arguments that transhumanism studies will cause significant changes in the social structures of today's societies are increasing day by day.

Considering the studies of transhumanism in general, it can be said that today's concept of combating doping remains quite innocent. Especially the effects of gene modifications on athletes, possible mutations threaten the natural genetics of the individual, while it is a strong possibility that today's sports will undergo changes. Since it is inevitable for countries with developed technology to advance in sports, it is highly likely that the current sports competitions will become meaningless or evolve into a completely different course. As Ertin and Bardakçı (2020) point out, if technology and pharmacology are used so intensely on the human body, the line between "natural" and "unnatural" will disappear, making it questionable what is important in sports competitions. As improvements and interventions in result of sports competition increase, it will become more important those, who give them superhuman abilities and interventions rather than the athletes who succeed with effort. It can be exemplified that the designer of the aesthetics made on the bodies, aroused more attention than the beauty of today's artists. In addition, as human development technologies become widespread, questions such as "who or what is a person" arise, and sports become one of the areas most affected by these questions. Because it seems difficult to talk about an equal and fair competitively environment in a "human+" future, without eliminating the ambiguities in concepts such as "human" and "beyond human" (Ertin & Bardakçı, 2020). Technological development may become the main reason for sporting success in the future. Today, sports and sporting success have performed a function that eliminates the differences between developed countries and undeveloped countries. It is known that the success of the backward countries against the developed countries in sports organizations has pumped morale and energy to the underdeveloped or developing countries and their peoples. Today, such sporting successes are qualified as victories, and they also have the capacity to give rise to the idea and inspiration that societies can be successful in other fields. In other words, sports and sporting achievements have played a role as an element that provides a balance between development and backwardness, albeit temporarily. However, developments in the field of Transhumanism seem to take away this function of sports. Now, it will be inevitable that countries developed in technology will be in the club of winners in sports.

The use of gene doping or gene transfer technology to improve athletic performance poses a significant threat to the integrity of anti-doping attempts. The use of these technologies has the potential to improve sports performance far beyond "traditional" pharmacological tools and is extremely difficult to detect them. This situation seems like a nightmare of sports. There is another ethical and more difficult side of gene transfer technology; the use of gene mapping in skill identification and the use of tissue engineering to recover from injuries such

as muscle atrophy following cruciate ligament injury. When such gene therapy is clinically available, can we deny its benefits to athletes? (McCrory, (2003).

Nowadays, thanks to genetic engineering, the possibility of meeting a perfect person or athlete who is resistant to diseases, with a longer life span and more qualified characteristics has increased considerably. A generation of athletes whose DNA sequencing has been interfered and whose characteristics can be inherited, will always be the favorite of the competitions. How will it be possible to distinguish between natural and artificial inheritance as long as a special marker is not used? Also, who can stand against an athlete who can access, manage and operate universal information with Neuralink-like chips, that can be implanted or attached to the brains of athletes? How will be the courage of an athlete who can have regenerative organs and tissues after any strain or accident? Who can overcome these nano-layers that provide ergonomic use of organs and protect them with nano-agents injected into the bodies of athletes? Well, is it possible to freeze the athlete and send him to the next century? Or will it be possible to download the athlete's memory and consciousness to external memories, upload them to other artificial bodies, reproduce them and take part in different venues (galaxies, planetes) at the same time? Or as Mazan (2015) also asked; Do we want to live forever? Do we want to end all suffering and eventually reach the stars by overcoming bodily fluids, thanks to our superhuman intelligence? Of course. But if the price is paid with our soul...

Some studies in the field of transhumanism in recent years go beyond of our social acceptance and norms, turn into agendas where some topics such as religion, morality and social philosophy are discussed in the center. In the recent future the genetic structure of human being can been intervened, in other words "GMO" athletes can be among us. In the face of this reality, where human become intervened by technological developments, doping agencies (WADA), sporting organizations (International Olympic Committee, International Sport Federations) and countries (Assemblies, National Sport Federations...) have duty to discussing the situation of athletes and sustainability of sport organizations. This will be the most important topics on their agenda and taking start to this combat from today, will not be a dreamy approach.

Recommendatıons

What is ethical? To stay with capablility of natural development of our body, or to gain competence by being modified mentally and physically? Which competitions do you think would be more interesting; natural athletes or artificial ones? Ethical regulations in sports should be reconsidered urgently by seeking answers to such questions. We are on the eve of taking action on the near-ending studies in the field of transhumanism. According this Transhumanist development, the predictions that individuals inequality will advance, the gap between the strong and the weak will be open even more. The question, "What kind of world we want to leave to the next generations?" is taking importance. It is clear that a global convention is needed for the protection of sports in general, and for the benefit of the athlete in particular. With new legal regulations concerning the athlete (human) and its nature all International Federations, International Olympic Committee (IOC), State Institutions and organizations must take care of sports and its competitions.

As it is the first research based on a literature review to describe the relationship between Transhumanism and Sport, the study has its own limitations. In the future studies, the relationship between Transhumanism and sport should be examined empirically by including certain measurements and experiments. It is also necessary to expand and focus on such Transhumanist studies more sensitively.

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