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Semantic Analysis of the Philosophical Discourse of the Transhumanism Concept in the Works of Russian Scholars

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Abstract: The purpose of this research paper is to semantically analyze the concept of transhumanism in the publications of Russian scientists, as well as to study the influence of the idea of transhumanism as the leading philosophy of human improvement on the global differentiation of the world through a comparative analysis of the level of life expectancy in the Russian Federation, the USA, and China. Findings indicate that, in general, when setting the right goals based on the Russian cosmism and transhumanism concepts can and should bring certain positive benefits to humanity. First of all, this involves treatment of incurable and complex diseases and enhancement of human capabilities in space expansion. The scientific contribution and practical significance of the research lie in the development of three exponential models of life expectancy growth in accordance with the indicator of economic development that is based on the gross domestic product per capita level.

Keywords: future; identity; intelligence; model; personality; posthuman; SDGs; singularity



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1. Introduction

Modern global scientific achievements and discoveries in the field of medicine, genetics, robotics, bionics, and artificial intelligence are very often associated with the philosophy of transhumanism [1–3]. The widespread dissemination of transhumanism ideas in the global information space indicates a significant increase in the attention to this progressive philosophical and social movement of thought. However, along with this, the possible ethical, moral, and social challenges and consequences of the implementation of the ideas of transhumanism, which will inevitably affect the next phase of the development of civilization and human evolution, should not be underestimated. In many countries, the attitudes of society and the state towards the ideas of transhumanism differ significantly. Certain scientific research, which in the future may be used to improve humans, requires special permits or is impeded by certain restrictions. This is especially true for research related to the human genome.

Among the number of countries studied (the study involved data on 106 countries of the world), 96 have political documents, including legislation, laws, instructions, codices, and international pacts, that concern regulation and control over application of genome editing technologies for embryo modification or human progenitor cells at an early stage. However, these 96 countries do not have any unified state policy directly related to the use of genetically modified embryos in vitro in laboratory studies (transformation of germ line genome). In other words, 23 countries (out of 96 countries) absolutely forbid such studies, whereas 11 only allow the use of such technology. Thus, 75 out of 96 countries still either prohibit or disapprove (closely to ban) the use of genetically modified embryos in vitro for editing of the hereditary genome [4].

In Russia, as in other countries of the world, the attitude towards transhumanism is also ambiguous. Therefore, it is necessary to comprehend the very concept of transhumanism, as well as the possibilities that open up with its development for a person and society. At the same time, it is also important to maintain an impartial critical view of current problems and to study the approaches of foreign and domestic scientists to this issue, from a philosophical perspective.

An unbiased critical approach to understanding transhumanism should, on the one hand, be based on utilitarian and rationally pragmatic discourse in terms of its aims and objectives. On the other hand, it is crucial to consider that the opportunities for humans and society must not obscure possible problems and consequences.

According to its followers, transhumanism is a synonym for an idea of current intellectual and physical human improvement. This applies to the issues related to controlling or reversing aging with the help of biological means or through direct digital replacement of the human [5]. The term transhumanism was introduced into the scientific discourse by Julian Huxley in 1957 when he openly discussed the possibility of people going beyond their limited biological state with the help of the latest technology [6].

Transhumanism is focused on freeing humanity from the limitations of biological life, as well as the creation of new bodies that will prolong our existence in the future. The pursuit of humans to free themselves from the limitations of nature, an idea that resembles ancient Gnosticism, raises a difficult question about the essence of man. In contrast to the existing point of view that we are our brain, today we can also confidently assert that human consciousness and subjectivity arise from complex interactions between the body and the environment. These qualities occur from a certain set of structural connections embodied in numerous organ systems and many connections within the brain. These connections take various forms, including structural, chemical, and electrical manifestations throughout the human body. This incarnation assumes that human consciousness and its attendant complex levels of experience cannot be replicated in inorganic forms such as computers or synaptic implants, without a significant loss of human identity. The Gnostic desire to escape our incarnation, found in transhumanism, carries the risk of dissolving human identity [7].

Undoubtedly, freedom, security, and well-being are positive values [8]. In addition, most people also desire a long and healthy life in harmony with nature, which is reflected by the philosophy of transhumanism. However, most of these idealistic perspectives ignore the downside: the potential danger to the human body posed by dramatic technological changes, including the rapidly expanding application of neurotechnology to transform human consciousness and the mind [9].

Transhumanism introduces a paradigm shift in the context of the concepts of human nature, progress, and future. The transhumanism ideology analysis shows a strong belief in the idea of human improvement through technological means [10]. The technological advancement of a human seems inevitable. However, a thoughtless pursuit of a new perfect posthuman world can lead to unexpected consequences [11].

Transhumanism is a key factor in scientific influence and a leading philosophy in the arena of human improvement [12]. It is a philosophical and political movement that addresses the issues of a post-human future in which human capabilities will be improved, including better health, cognitive development, longer life expectancy, and an improved gene pool [13]. On the other hand, transhumanism is a radically utopian movement mainly associated with the development and application of technologies for human performance improvement. The baseline assumption is that humanity can transcend its biological limitations, and this is desirable or even necessary for its long-term survival [14].

According to the transhumanistic paradigm, neither social nor political norms should be an obstacle to the technological and scientific progress of mankind, or hamper the rational decisions of free citizens to apply biotechnological achievements. The ideologists of this movement believe that citizens have the right to shape their bodies and souls in accordance with their own preferences and the potential of biotechnology and pharmacol-

ogy. In addition, they have the right to live forever if they want to [15]. The main task of transhumanism is to transform people into posthumans with the help of available and new technologies [16].

1.1. Literature Review

1.1.1. Singularity

The future development of transhumanism is associated with the phenomenon of technological singularity. Both transhumanism and the concept of “technological singularity” arose at the intersection of many areas of science and philosophy.

Technological singularity is defined as a hypothetical time point at which artificial intelligence becomes capable of recursive self-improvement or autonomous creation of smarter and more powerful machines that surpass the level of the intellectual development of people and their ability to understand and control this process. Due to the fact that the capabilities of super-intelligence may be incomprehensible for humans, it can be argued that technological singularity is the point beyond which events can become unpredictable [17].

The technological singularity theory, which is essentially a form of a stronger transhumanist discourse, envisions dramatic evolutionary changes through artificial intelligence. At the same time, the boundaries between intelligent machines and humans will be blurred. This will result in the onset of a post-biological and post-human future, when intelligent technologies will become autonomous and capable of constant self-improvement [10]. In fact, the idea of singularity indicates something higher than the human mind itself, concerning something ineffable which also reflects the hopes and fears of humanity [18].

1.1.2. Global Trends in the Development of Transhumanism at the Beginning of the 21st Century

Transhumanists believe that technology will endow us with intellectual, physical, and psychological capabilities that go far beyond what modern humans are familiar with, and that it will ultimately change the human race and human societies to a significant extent. Over the past 20 years, transhumanists have played a leading role in the development of radical life-extension technologies, artificial intelligence, and have been actively involved in efforts to make outer space habitable for humans [19].

Transhumanism recognizes that modern humanism is based on philosophy and the point of view that comes from this approach, according to which reason, technology and creativity will make the future better than faith alone. The aspect of transhumanism emphasizes that while stemming from humanism, transhumanism goes beyond humanism in terms of both means and goals. Humanistic methods are based on education and cultural improvement to develop the human being; however, transhumanists want to challenge human nature by applying technology to negate the constraints imposed by biological and genetic heritage. Thus, transhumanism transcends humanism in the context of its attempt to create something that is no longer accurately described as human, but as posthuman [20].

New technologies open up the possibility of redesigning human nature. For example, the DNA editing system CRISPR-CAS9 [21], as well as advances in genetics, nanotechnology, biotechnology, and robotics create serious problems for our understanding of the human condition. It is not clear whether these technological advances can ultimately enable us to completely overcome the limitations of human corporeality, and whether this effect can be beneficial for people. Transhumanists take a positive stance on these issues. According to the intellectual and cultural movement of transhumanism, humans are in their early stages of development, and this encourages the use of modern science to dramatically improve physical, intellectual, psychological, and moral abilities. Thus, human nature is amenable to change, and the positive message of transhumanism is that technology gives us a chance to correct freaks of nature [22].

1.1.3. The Main Dilemmas and Contradictions in the Theory, Methodology, and Study of Transhumanism

There is an increasing interest in the study of the issues related to transhumanism. The analysis has shown that in Google Scholar database, the number of Russian and English publications containing the keyword transhumanism has grown significantly in recent years (Figure 1).

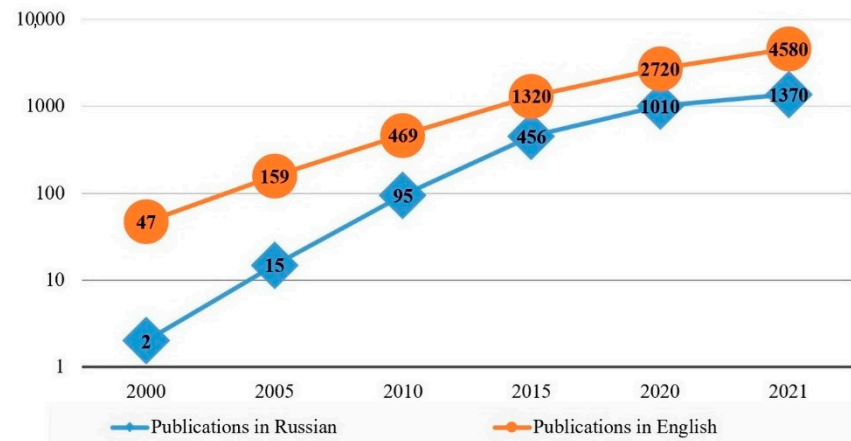


Figure 1. Dynamics of changes in the number of Russian and English publications focused on the concept of transhumanism in the Google Scholar system. Source: own development based on the analysis of Google Scholar data.

When entering search terms in the Google Scholar system, only citations were considered. Quantitative analysis and calculation of links were carried out on a cumulative basis. During 2000–2021, the number of publications registered in Google Scholar in English with the mention of the term “transhumanism” increased from 47 to 4580, and in Russian, respectively, from 2 to 1370.

In one of the largest Russian scientific electronic libraries eLIBRARY.RU, as of the end of September 2021, the concept of “transhumanism” is mentioned in 4737 publications out of 37,476,882 units. That is, this area of scientific research is considered in less than one hundredth of a percent of the total number of publications registered in this domestic information system and is developing along with other specific branches of science. The small number of publications is due to the fact that until 1992, in the Soviet philosophical discourse, the issue of transhumanism was limited to purely scientific aspects, not concerning social and spiritual contexts. Only at the end of the 20th century the interest in transhumanism returned to Russia.

1.1.4. Setting Objectives

Humans have always strived to develop new abilities and expand social, geographic, and mental boundaries. At least some people tend to always look for a way to overcome all obstacles and limitations on the path to human life and happiness [23]. Unfortunately, both in foreign and Russian transhumanism studies, the main emphasis is placed on individual advantages that new technologies and knowledge can provide to improve human capabilities and quality of life, while a critical view of this philosophical and social trend relates to constantly repeated stereotyped beliefs. Therefore, a semantic approach to the study of this issue is very important. It makes it possible to assess quantitatively and qualitatively the level of elaboration of modern aspects of the transhumanism theory in the Russian scientific discourse.

Life extension and death avoidance are some of the many important aspects of transhumanism. Based on the foregoing, the purpose of this study is to analyze philosophically and semantically the concept of transhumanism in the publications of Russian scientists,

as well as to study life expectancy through the example of the comparative analysis of the Russian Federation, the United States, and China.

The objectives of the study include cross-country analysis of life expectancy as an indicator of the achievement of the goals of the transhumanism movement, as well as factors that influence it. Among these factors, those that in fact are the closest to the goals and ideas of transhumanism should be highlighted. They are cyborgization and transplantation, which are developing at an ultra-fast pace.

2. Results

In scientific discourse, the idea that the 21st century is the century of transhumanism has been gradually gaining ground. To a certain extent, this rationalistic paradigm is a continuation of the ideas of humanism. However, these ideas largely continue to develop the concept of humanism in a new technological context while diminishing the importance of their spirituality. This can be judged from the results of the semantic analysis of Russian scientific publications in recent years (2020–2021) devoted to the development and approval of the modern concept of transhumanism (Table 1).

Table 1. Semantic analysis of new Russian scientific publications (2020–2021) focused on transhumanism.

Source	Context of the “Transhumanism” Mention	Positive or Critical Attitude towards Transhumanism	Main Idea
Ivanov [24] Kuzub and Gusar [25]	Religious Philosophical	Neutral Positive	Immortality, life extension posthuman
Polomoshnov [26]	Religious	Critical	Antihuman anthropology of transhumanism is the antipode of the humanistic anthropology of Christianity
Izotov [27]	Scientific	Critical	Immortality, human improvement
Alexandrov [28]	Philosophical	Critical	Russian cosmism as an alternative to transhumanism

Source: own development.

The analysis of recent publications has shown that there is a scientific discourse related to the views of transhumanism. It is obvious that transhumanism, first of all, aims to accelerate the evolution of *Homo sapiens* to the posthuman level. However, the majority of Russian researchers [24,26,27] critically consider the ideas of transhumanism and see them as an antipode of the earlier scientific concept of Russian cosmism.

This concept was first voiced by the famous Russian religious thinker, philosopher, and futurologist Nikolai Fedorov. He argued that the life of one person is also important. Therefore, he dreamed of the time when new opportunities would appear, and humanity would finally learn to resurrect people. He assumed that scientific and technological progress would make it possible to collect scattered molecules and atoms. Generally, these religious and philosophical ideas are focused on death avoidance and the possibility of human salvation through the development of science and in the process of space expansion of our civilization.

Despite the obvious difference in the views of many cosmists, the fundamental aim of their philosophy was to understand the significance of human improvement and realizing human potential. For someone who is familiar with both Russian cosmism and modern transhumanism, it may seem that the continuity between them is undeniable. However, in certain aspects, cosmism acts as the opposite of modern transhumanism. Cosmism is based on the humanistic nature of humans and the preservation of their spiritual foundation, while modern transhumanism strives to create a posthuman and the development of cybernetic intelligence.

One can note that scientific education on a par with historical education as well as the support for scientific and technological progress contribute to the development of the philosophy of transhumanism, posthumanism, and essential cognitivism [29].

Over the years, the idea of transhumanism has been centered on the issue of overcoming the limitations of the human body, changing its mental, physical, and cognitive capabilities [30]. At the same time, one of the expected consequences is the achievement of biological or other (cybernetic) forms of immortality, as well as the prolongation of human life. One of the available indicators for a comparative assessment of this goal's achievement is the indicator of the human life expectancy level. An analysis of countries, associations of countries, and individual regions of the world with the highest life expectancy indicators shows that they are characterized by different standards of living and well-being, depending on the achieved economic and scientific progress development (Figure 2).

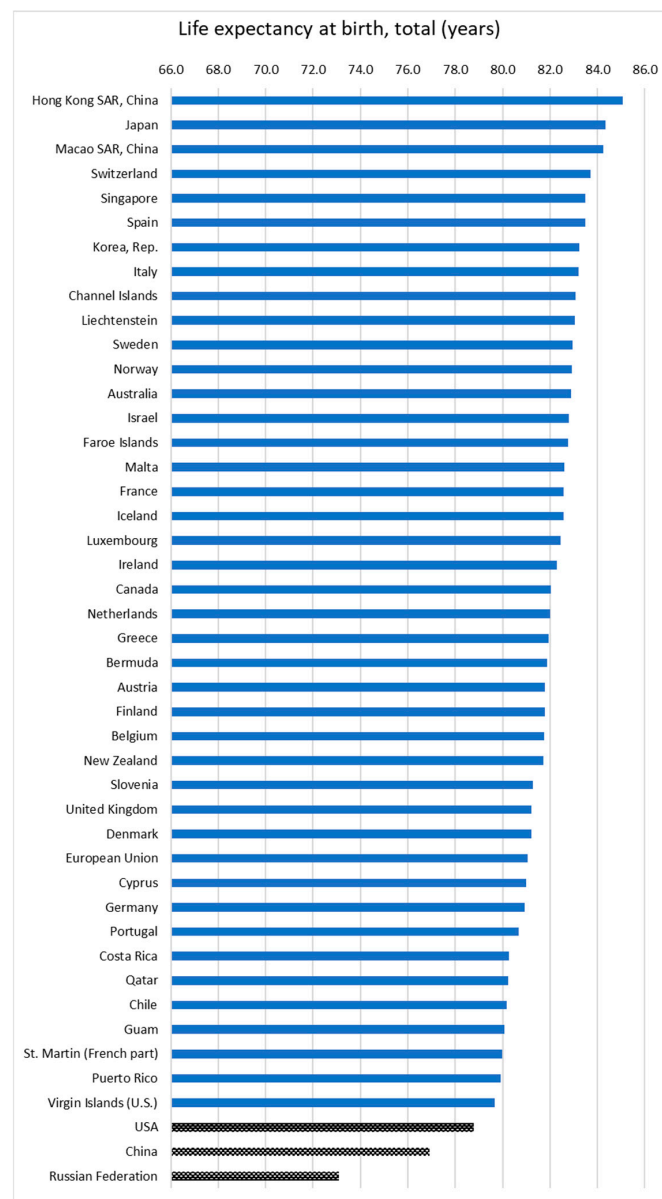


Figure 2. Countries and regions of the world with the highest life expectancy (about 80 years or more) and the Russian Federation. Source: developed by the authors based on data from the World Development Indicators [31].

In modern conditions, the world leaders in terms of life expectancy are the Chinese regions of Hong Kong and Macau, Japan, Switzerland, Singapore, Spain, South Korea, Italy, Germany, and a number of other countries. In these countries and regions, the level of life expectancy significantly exceeded the average indicator of 80 years while the average in the world does not exceed 73 years.

Based on the World Bank data, we analyzed 105 different countries by level of life expectancy and per capita income, as well as the number of patents filed. These three indicators make it possible to assess the state and differentiation of the countries in terms of living standards, well-being, and scientific patent activity in the context of the issue under study (Table 2).

Table 2. Descriptive Statistics.

	Life Expectancy at Birth, Total (Years)	GDP per Capita (Current US\$)	Patent Applications Filed
N	105	105	105
Mean	76.550	21,899.690	23,966.324
Std. Deviation	5.266	23,134.564	129,754.815
Minimum	60.900	503.600	1.000
Maximum	85.100	114,685.200	1,243,568.000
Cv, %	6.9	105.6	541.4

Source: own development based on World Development Indicators [31].

The data obtained indicate a fairly high variation of the countries under study in terms of GDP (Gross Domestic Product) per capita and the number of patents filed. At the same time, differences in living standards have a very low coefficient of variation. This may indicate that different levels of well-being and scientific and technological development have a certain impact on life expectancy and quality. However, this is not a consistent pattern. Additionally, there are countries with average per capita income, which, however, have a relatively high life expectancy (for example, Greece, Malta, Portugal, and several other countries). Other factors, including a good climate, diet, and lifestyle, may have an impact here. At the same time, the leading countries of the world in terms of the number of patents were selected from the general group. Comparative analysis revealed that most of them are characterized by high indicators of economic and scientific progress and high life expectancy (Table 3).

Table 3. Comparison of the world's leading economic countries by patent level, research and development costs, number of researchers, and life expectancy.

Country Name	Life Expectancy at Birth, Total (Years)	GDP per Capita (Current US\$)	Patent Applications Filed	Research and Development Expenditure (% of GDP)	Researchers in R&D (per Million People)
China	76.9	10,216.6	1,243,568	2.2	1471.3
United States	78.8	65,279.5	285,113	3.2	4821.2
Japan	84.4	40,113.1	245,372	3.2	5374.6
Korea, Rep.	83.2	31,846.2	171,603	4.6	8407.8
Germany	80.9	46,467.5	46,632	3.2	5396.5
Russian Federation	73.1	11,497.6	23,337	1.0	2746.7

Source: developed based on World Development Indicators [31].

In these countries, there is a high life expectancy, which is closely related to the level of their scientific progress. This level is characterized by such indicators as high research and development costs in the GDP structure and the number of researchers whose study fields include issues directly related to transhumanism. This is primarily genetics, artificial intelligence, and medicine. The number of patents reflects the general scientific activity and scientific progress of the country. This is also crucial for the development of transhumanism

technologies. At the same time, patents may not directly concern the transhumanism ideas, but may be related to advanced technologies that can be used for transhumanism purposes. These are, for example, biochemistry, cybernetic systems, genetic engineering, and other areas of scientific research. At the same time, it can be argued that the factor of material well-being is still the most strongly correlated with life expectancy within the framework of this study. This is confirmed by the data of the correlation analysis of the studied group of countries (Table 4).

Table 4. Pearson’s Correlations.

		Pearson’s r	p
Life expectancy at birth, total (years)	GDP per capita (current US\$)	0.690 *	<0.001
Life expectancy at birth, total (years)	Patent applications filed	0.079	0.424
GDP per capita (current US\$)	Patent applications filed	0.059	0.547

Note: * $p < 0.001$.

The most statistically significant ($p < 0.001$) is the cross-country correlation between life expectancy and the level of gross domestic product per capita (0.690). At the same time, there is no such relationship between life expectancy and the number of patents, as well as between the level of gross domestic product per capita and the number of patents. This is explained by the fact that the factor of scientific and technological development affects life expectancy only to a certain extent. Other factors are also important: ecology and habitat, quality of water and food, food culture, quality of medical care, and mentality of the population [32,33].

When considering the ways of development of transhumanistic ideas in different countries in the context of their influence on life expectancy, it is also necessary to take into account temporal variations in the indicators under study. Thus, through the example of the analysis of the World Bank information on the Russian Federation, the United States, and China, the correlation effect of the level of gross domestic product per capita on life expectancy indicators for the period of 1992–2019 was studied (Table 5).

Table 5. Models of the dependence of life expectancy in the Russian Federation, the United States, and China on the level of GDP per capita for the period of 1992–2019.

	Russian Federation	USA	China
Life expectancy at birth, total (years) in 1992	66.9	75.4	69.4
Life expectancy at birth, total (years) in 2019	73.1	78.8	76.9
Change in 2019 to 1992,%	109.3	104.5	110.8
GDP per capita (current US\$) in 1992	3098.8	25418.9	366.5
GDP per capita (current US\$) in 2019	11497.6	65279.5	10216.6
Change in 2019 to 1992,%	371.0	256.8	2787.6
Model	$y = 64.6530752e^{0.0000068x}$	$y = 73.4080150e^{0.0000012x}$	$y = 70.6151207e^{0.0000093x}$
R ²	0.657	0.902	0.878
r	0.81 *	0.95 *	0.94 *

Note: * $p < 0.001$.

In general, a high and statistically significant correlation ($p < 0.001$) between the indicators under analysis was observed in the United States (0.95) and China (0.94). In the Russian Federation, this relationship was also high (0.81), but the correlation coefficient was lower compared to those of the United States and China. This is due to the fact that in the Russian Federation some factors are stronger and have a greater impact on life expectancy. Thus, in the United States and China the level of gross domestic product per capita is a key factor, while in the Russian Federation GDP per capita distribution, income inequality, demographic crisis, and other unresolved issues play an important role. For example, the average income is lower, food is worse, and the crime rate is higher.

Based on the data studied, three exponential models of life expectancy growth were developed in accordance with the indicator of economic development that is based on the gross domestic product per capita level. The models have been designed for the Russian Federation, the USA, and China. In scientific research, exponential regression is used to construct these models, which, as a rule, is calculated based on the mathematical analysis of experimental data. This type of regression is used to model situations in which the quantitative growth of the phenomena under study begins slowly and then accelerates infinitely quickly, or, on the contrary, the decline begins quickly and then slows down.

The exponential regression model equation is as follows [34–36]:

$$Y = ab^x \quad (1)$$

where:

y : The response variable

x : The predictor variable

a, b : The regression coefficients that describe the relationship between x and y .

To calculate the parameters of the model, statistical data on gross domestic product per capita and life expectancy in the Russian Federation, the United States, and China were taken for the period of 1992–2019.

In practice, plugging the predicted growth rates of gross domestic product per capita into the regression equation makes it possible to determine the life expectancy for each country with a high degree of probability.

3. Discussion

The study of the complex philosophical category of transhumanism, as well as the comparative semantic analysis of the new Russian scientific publications on transhumanism for the period of 2020–2021 show that there are three most common scientific views. The first one involves the critical analysis of the general paradigm of transhumanism [24,26,27]. The potential improvement in personality and body identity proposed by the proponents of transhumanism is an external factor in relation to the individual, as it depends on a group of technicians who are often unconcerned about improving identity that is viewed from the perspective of developing complex systems. There is also some concern that the transhumanism project may have deviated from its original or acceptable goals of improving the well-being and quality of life of the population (The ideas of transhumanism, initially perceived as progressive, aimed at improving the well-being and quality of the population's life, have recently received more and more critical comments. This is primarily due to apprehensions that transhumanism technologies can radically change the biological and social essence of a person, replacing it with an artificial cybernetic system, which can lead to unpredictable consequences) [6].

Many researchers are trying to find out whether chemical cognitive improvement is compatible with a rational will to maximize one's own talents. After all, people cannot optimize all their abilities and talents. They always have to compromise between different self-improvement options. Thus, an opportunity to improve general cognitive abilities is obviously attractive within the framework of the Kantian concept (The Kantian philosophy contains interesting aspects for extrapolating a human project into the future. First of all, this is the philosophy of the "Kingdom of Ends", the idea of achieving civil status and eternal peace, the ideal of morality as conformity of actions to a categorical imperative, which is relevant in discussions regarding the aims and objectives of transhumanism). The Kantian concept was associated with an attempt to understand what the human being is and what it can become in the future. However, in light of the debate about the potential benefits and side effects of smart drugs, it seems unclear whether chemical cognitive enhancers can expand the scope of talents that can be developed within a limited timeframe or whether they reinforce the tendency to focus on a single goal and a single activity, and therefore, tend to be one-dimensional. At the same time, the method of chemical improvement of cognitive abilities contributes to one-sided development, as it leads to limited attention to

work, loss of interest in other activities, loss of creativity, or loss of brain flexibility; thus, this will limit the development of all human abilities [37].

Transhumanism and its supporters often forget that the imperfection of the human being and their dissatisfaction with reality allow them to have certain aspirations, strive for progress, think, win, or even make mistakes. First of all, people can live and go beyond the limits of the possible, or in other words, they can be humans [38]. It is also important to understand another aspect of the problem under study. Transhumanism and the concept of robotization will contribute to the phenomena that can be observed today. Machines considerably reduce human labor, and the rest of the work is done in accordance with the rhythm of the machine. At the same time, the human spirit in the working world of modern industrial society becomes an anachronism and the work of an individual person loses its value. Mechanized work no longer fulfills the educational function that enables self-determination, critical thinking, a sense of community, and overcoming one's natural whim. Rather, the internal logic of work in its increasingly mechanized form reduces both productive and consumer activities to meaningless hard work, which no longer fulfills the function of eliminating natural limitations, but rather handles the mechanisms of the cultural industrial complex [39]. On the other hand, it should be recognized that transhumanism as an initially theoretical concept receives practical recognition every year. At the same time, it should be understood that many technical innovations, including some of the most important ones, were developed without any clear horizon of practical application [40].

There is another more positive view. Transhumanism is not just a scientific and technical project. Through the definition of what it means to be a human, social relationships, the world it promotes, the actions it involves, and the decisions it advocates, the transhumanist movement in its various forms carries a plan and vision for its own future society. This entails new relationships with the world, communities, and the state. When exploring this relationship, it is necessary to go beyond the ethical, utilitarian, moral, and religious views that tend to dominate current debates on this issue [41].

In the concept of transhumanism, the achievement of immortality appears to be feasible, as well as leading to the good of all sentient species. At the same time, the theory of humanism requires updating to create new ethics imperatives. Russian cosmism and Western transhumanism are two important intellectual and philosophical movements: the former emerged at the end of the 19th century in Russia and the latter is the revival of some ideas of cosmism and Western humanism, as well as a consequence of the technological revolution of the last quarter of the 20th century [42]. Russian cosmism emerged at the turn of the 19th and 20th centuries as an integral philosophical and religious worldview based on cosmic thinking and consciousness enriching the scientific, religious, and philosophical thought of its time [43].

The results of the research generally confirm the above data. It is important to not only critically examine the theory of transhumanism but also to understand the strengths of its use for the benefit of all people. Transhumanism can and should bring certain positive benefits to humanity. First of all, these involve treatment of incurable and complex diseases and enhancement of human capabilities in space expansion.

4. Materials and Methods

4.1. Estimation Procedure

The assessment of life expectancy in comparison with the gross domestic product per capita is reasonable to conduct alongside the semantic analysis of the transhumanism concept. This allows for the consideration of the economic, social, and scientific aspects of this phenomenon in the context of current trends in human improvement and for predicting its possible future. The implementation of transhumanism will largely depend on the level of scientific, technical and economic opportunities in countries where this concept has social recognition as a factor in achieving a high-quality long life.

The study is based on the World Bank data for the period of 1992–2019. The World Bank Database includes dozens of indicators and hundreds of measures and is also the most complete in terms of content and information available for collection and analysis in scientific research. In addition, the main indicators and statistics are collected here both in dynamics for a certain period and in a country context. The selection of the period is due to the fact that it is advisable to consider information on the Russian Federation after the collapse of the USSR, when the country became a new subject of international law.

4.2. Data

A cross-country study of the impact of economic (gross domestic product per capita) and scientific and technical (number of patents filed) factors was carried out by country for 2019, based on the availability of this information. First, global data from 266 countries, interstate associations, regions, and unions were ranked, until only countries were left. Next, the countries which failed to provide information on the relevant indicators were excluded. As a result, 105 countries remained, and their data were used in the correlation and regression analysis and model construction. The regression analysis and model construction were carried out according to the methodology developed by Carlberg [34] and Garson [35].

This study proceeded from the concept that transhumanism and digital humanities should be combined to form a single field of research. The factor that connects both studies is that digital humanities base their power on data mining and text mining while transhumanism mines and processes people as data to empower them to go beyond natural trends [44]. In the study, when working with the World Bank data, Microsoft Excel software was used. To perform the correlation and regression analysis, SPSS Statistics was used.

4.3. Research Limitations

The semantic analysis of the publications of Russian scientists considered studies conducted over the last 2 years and containing a holistic view of the problem under study. The experimental part of the study relies on the data of the period of 1992–2019 and takes into account their availability in the context of the countries under analysis.

5. Conclusions

Based on the research data, it can be concluded that transhumanism can and should bring certain positive benefits to humanity. First of all, this involves treatment of incurable and complex diseases and enhancement of human capabilities in space expansion. The analysis of data from 105 different countries on life expectancy and per capita income variations, as well as the number of patents, made it possible to estimate the global differentiation of the world by living standards, well-being, and scientific development within the framework of the study. One of the defining concepts within the transhumanism discourse framework is an increase in life expectancy with subsequent death overcoming and a radical improvement in the quality of human life, which determined the choice of the indicators for research. It was found that the most statistically significant ($p < 0.001$) is the cross-country correlation between life expectancy and the level of gross domestic product per capita (0.690). At the same time, there is no such relationship between life expectancy and the number of patents, as well as between the level of gross domestic product per capita and the number of patents. This is explained by the fact that the factor of scientific and technological development affects life expectancy only to a certain extent. Other factors are also important: ecology and habitat, quality of water and food, food culture, quality of medical care, and mentality of the population. The scientific contribution and practical significance of the research lie in the development of three exponential models of life expectancy growth in accordance with the indicator of economic development that is based on the gross domestic product per capita level. The models have been designed for the Russian Federation, the USA, and China. In practice, plugging the predicted growth rates of gross domestic product per capita into the regression equation makes it possible to determine the life expectancy for each country with a high degree of probability. The dis-

course of transhumanism examines scientific progress and the most complete satisfaction of the needs of society related to the ideas of the evolution of mankind and overcoming the biological limitations of humans.

Transhumanism considers scientific and technological achievements as a fundamental basis for the development and enhancement of human intellectual and physical capabilities in order to eliminate problems that, according to the supporters of this doctrine, are undesirable. This concerns the issue of diseases, ageing, and death. This study has shown that GDP and high life expectancy are correlated. At the same time, it should be recognized that the level of research and development in life extension and enhancement technologies seems to be more closely related to the sociocultural acceptance of the assumptions of transhumanism ideology. Although measuring the level of cultural support for explicitly transhumanist ideas was not the purpose of this article, further research may show how and why China, Russia, and the United States are at the forefront of transhumanist-inspired research.

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