

Reproduction of Human Capital in the Arctic Regions of Russia: Socio-Cultural Context*



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Abstract. The formation and reproduction of human capital, as the most important prerequisite for modern development, has not only sectoral, but also regional features. The article, which continues a series of our works on human capital in the conditions of the Arctic zone of the Russian Federation, considers the influence of socio-cultural factors on human capital in the Arctic territories. The aim of the study is to present a new approach to the role of socio-cultural factors (foundations and components) in human capital development in the Arctic regions for a new (neo-industrial) stage of their exploration. In this regard, we clarify conceptual foundations of the studies on human capital presented in the works of researchers from Russia and other countries. Within a certain theoretical and methodological framework, we analyze, compare, and summarize the findings of a sociological study conducted in March – May 2018 in the Arkhangelsk Oblast (in the Arctic territories) and Yamalo-Nenets Autonomous Okrug; to this end, we use methods such as mass surveys and statistical data analysis. We provide data that characterize human capital of the Northerners in terms of their financial situation; we prove the existence of a direct dependence on regional (higher – in Yamalo-Nenets Autonomous Okrug), sectoral (especially oil and gas enterprises), socio-professional (especially managers, highly qualified specialists, state and municipal employees) aspects. With the use of multidimensional measurements, we show the interrelations and individual dependencies of the variables that characterize education, health and socio-professional status in the structure of human capital in the surveyed regions. We also focus our attention on the role of value orientations in the formation and reproduction of human capital. In conclusion, we note that the impact of socio-cultural factors on human capital is ambivalent: on the one hand, they act as a fundamental basis, on the other hand, some of them (education, work motivation, etc.) act as structural components. We propose measures aimed at strengthening national and regional policies (including investment) in the development of human capital in the Russian Arctic.

Key words: human capital, Arctic regions of Russia, socio-cultural factors, sociological approach, multidimensional measurements.

Introduction

The transition to a post-industrial economy since the early 1960s and the subsequent transition to an information society in the 21st century led to the emergence of the term “human capital”. It first appeared in economics and spread rapidly among other disciplines [1; 2; 3]. The past sixty years witnessed the development of many theories related to this category, and the authors of the fundamental ones were awarded the Nobel Prize (T. Schultz, 1979, G. Becker, 1992). Their ideas were further elaborated on not only theoretically, but also analytically and practically in the developments and methodologies of the UN, the World Bank and other international organizations. Despite the variety of approaches to interpretation of the term “human capital” and its comparison with other forms of capital, it focuses on certain qualities (including their quantitative assessment) of the worker’s personality as a source of creative and innovative productivity embodied in a modern and high-quality product [4; 5; 6]. For individual enterprises, companies, as well as for regions and entire countries, human capital is one of the main resources for boosting competitiveness and development [7; 8]. Obviously, at present, economic and social issues cannot be addressed only by improving material factors [9]. Moreover, focusing on the material aspect alone can become a certain prerequisite for national vulnerability [10]. The gap between countries in terms of the pace of innovation-driven development is growing; lagging behind can result in stagnation. In these conditions,

a strategy for modernization on an innovation basis turns out to be the only choice to Russia: either the country will take a step into the future and give an impetus to the dynamic development of its knowledge economy, for which human capital is of critical importance, or it will join the ranks of outsiders [11].

Developed countries have higher indicators of human capital compared to Russia; this can be seen in *Table 1*, which characterizes the structure of comprehensive wealth of the Russian Federation and members of the Organization for Economic Cooperation and Development (OECD). We see that with a higher proportion of natural (resources) and produced capital, human capital in Russia is more than 1.5 times lower than in OECD countries. This indicates the excessive role of natural resource rent and traditional industries in the Russian economy and a lack of knowledge-intensive industries and services provided by highly qualified specialists (IT, finance, consulting, etc.).

Table 1. Comprehensive wealth of the Russian Federation and OECD countries, 2017, %

Indicator	RF	OECD countries
Human capital	46	70
Produced capital	33	28
Natural capital	20	3
Net foreign assets	1	-1

Source: Ga'lcheva A. Human capital is gaining weight. *RBK*, 2019, December 4, no. 196. Available at: <https://www.rbc.ru/newspaper/2019/12/05/5de76fa19a79476a1ebb8bec>

In Russia, with its vast territory, extremely diverse climatic, socio-economic and socio-cultural conditions, the reproduction of human capital for modernization on an innovation basis has distinctive regional specifics [12]. At that, the issues of reproduction of human capital in the context of neo-industrial development in extreme natural and climatic conditions in the regions of the Arctic zone of the Russian Federation require special attention. The adopted Strategy for Development of the Arctic Zone of the Russian Federation

and Ensuring National Security for the Period until 2035¹ and the state program of the Russian Federation “Socio-economic development of the Arctic zone of the Russian Federation”² are aimed at a deep comprehensive analysis of the processes of formation and reproduction of human capital in the Russian Arctic.

Along with socio-economic factors, socio-cultural factors deserve special consideration, since they are not given due attention in the comprehensive analysis of human capital in the Russian Arctic regions. Based on the results of the study, we put forward new knowledge about the role of socio-cultural predicates and components of human capital in the conditions of the Far North in the case of several Arctic regions.

Research methodology, design and technique

Originating in the 1960s, the theory of human capital was developed comprehensively and has become an important response of economics and related branches of knowledge to the lingering and emerging challenges and realities of global economic life; the theory helped to develop, substantiate and implement measures aimed at investing in man and accumulating human capital [13]. Due to the huge number of publications on this subject and the limited format of the journal article, we have chosen the theoretical and methodological aspects expressed in the works of foreign and Russian researchers that we consider to be most significant for our purposes.

Modern concepts of human capital retain the original economic approach to human behavior, proposed by one of the founders of the theory, G. Becker, in the following postulates:

¹ Strategy for Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period until 2035: Decree of the President of the Russian Federation no. 645, dated October 26, 2020.

² On approval of the state program of the Russian Federation “Socio-economic development of the Arctic zone of the Russian Federation: Resolution of the Government of the Russian Federation no. 484, dated March 30, 2021.

- abilities, knowledge, professional skills, motivation become capital at the time of the purchase and sale of labor, hiring or receiving remuneration by the performer of the work;

- the growth of human capital should contribute to the growth of labor productivity and production;

- the appropriate use of capital should lead to an increase in workers' income;

- income growth encourages a worker to make investments in health and education to increase the stock of knowledge and skills in order to use them effectively afterwards [3].

With regard to these positions, human capital is interpreted in a broad and narrow sense: 1) human capital is a set of abilities in an individual that enable them to perform various social roles and functions to achieve goals in personal and socially useful activities in order to satisfy one's needs; 2) human capital is a set of abilities in an individual that create competitive advantages in work, endowing them with freedom in choosing the scope of application of their abilities to receive remuneration [14]. The above definitions emphasize various subject-subjective meanings (frames), which are important to take into account when studying socio-cultural factors, including value-motivational orientations (attitudes) and the allocation of appropriate groupings.

According to modern interpretations of human capital, it has the following properties:

- its formation requires significant costs from an individual themselves and from the social system in which an individual lives and functions;

- it can be accumulated (increased) – an individual can acquire certain skills, abilities and improve their health;

- throughout the life of an individual, it not only multiplies, but also “wears out” – knowledge becomes obsolete, as well as skills and abilities; therefore, the cost of human capital decreases (human capital is amortized);

- investment in human capital allows its owner to receive a higher income (effect) in the future;

- investment in human capital is of a long-term nature (this applies to investment in “education capital”, “profession capital”, and “health capital”);

- it differs from physical capital in the degree of “liquidity”: we cannot separate it from its bearer, an individual;

- direct income received by an individual is controlled by themselves, regardless of the source of investment;

- the functioning (use) and reproduction of human capital depends on the decisions of an individual and their own will; the degree of return on human capital depends on an individual's own interests, preferences, material and moral interest, worldview and cultural features [15].

Several of these properties are obviously related to the socio-cultural context of the reproduction of human capital, specifics of functioning of non-economic institutions in a particular society and the collective ideas and value orientations behind them. This circumstance prompted us to go beyond the econometric approach to analyzing the conditions of human capital reproduction (for more information, see [16–21]) and to search for a connection between its structural components and some variables characterizing the socio-cultural factors that influence its accumulation.

The general structure of human capital in our study is represented by several key components: health, educational, professional, and cultural capital. Each type of capital has a set of indicators; measuring them, we can determine its general level [22, p. 97]. Individual parameters corresponding to each type of capital are presented in *Table 2* (their list is deliberately limited in comparison with those found in the specialized literature, since we were interested only in those indicators that can be measured in the framework of mass population

Table 2. Structural components of human capital and their indicators

Basic component of human capital	Indicators of the basic component of human capital
Health capital	<ul style="list-style-type: none"> - physical health - emotional and mental health - the level of health care development - life safety
Educational capital	<ul style="list-style-type: none"> - general knowledge - special knowledge - self-education skills
Professional capital	<ul style="list-style-type: none"> - work experience and professional skills - organizational skills - entrepreneurial ability and experience
Cultural capital	<ul style="list-style-type: none"> - motivation for working - motivation for self-development (including self-education) - prevailing value orientations - attitude toward social norms - communication skills
Source: own compilation.	

surveys and that reflect the socio-economic and socio-professional features of individuals, self-assessment of their health, educational level and value system, as well as assessments of some environmental (spatial-territorial, regional) factors, which can be compared with expert assessments and statistical data).

Most of the indicators presented in the table are biomedical, or socio-economic according to their nature or objective function; others, referred to the parameters of “cultural capital”, reflect historically established and socially approved patterns of behavior, institutions (in the interpretation of D. North – “rules of the game”, i.e. a set of social norms that ensure communication and cooperation between individuals [23, pp. 3–10]) and the basic values of specific communities at different levels (local, regional, national).

The grounds for this approach can be found in economic and social theories that claim to describe and explain the mechanisms of “conversion” of socio-cultural features of individuals and groups into their economic behavior and its results. Thus, such foundations are rooted in the theories of classical institutionalism (T. Veblen, J. Commons) [24] and economic psychology (G. Tarde, G. Katona) [25; 26].

Within the framework of the neo-institutional approach, exploring the problems of organizational behavior and decision-making, H. Simon developed a model of economic behavior called “bounded rationality” [27]. It opens up opportunities for explaining the adoption of economic and other decisions by actors on the basis of previous social experience and norms and patterns of behavior learned during socialization, which largely depend on a certain socio-cultural environment in which the individual was formed.

Theoretical provisions on the connection of human capital with the mechanisms of human economic behavior were developed in the works of D. Kahneman and A. Tversky [28; 29], who put forward the prospect theory which is original for the methodology of behavioral economics. They show that when making economic decisions, people choose the option with the greatest psychological perspective (i.e., the highest level of psychological comfort), based on their stereotypical ideas and intuition.

Another viewpoint in understanding the connection of human capital with non-economic factors is presented by the American scientist R. Thaler, who considers the influence of people’s ideas about justice on economic behavior [30; 31].

Comprehensive studies of human capital, promotion and development of provisions on the influence of socio-cultural factors and collective ideas on economic practices fall within the scope of sociology. The beginning of this line of research was laid in M. Weber's famous work *The Protestant Ethic and the Spirit of Capitalism*. It attempts to establish a connection between the system of values derived from a specific religious doctrine and the specifics of organization of entrepreneurial activity, including the aptitude for it. The classic thesis of M. Weber's statement that the work ethic of Protestantism contributed to greater "economic rationalism" and, as a result, a higher level of entrepreneurship development in countries with predominantly Calvinist populations [32, pp. 67–69, 204–206], later, although criticized, stimulated the development of concepts of socio-cultural conditionality of economic practices and, thus, led to the study of this aspect of human capital in the works of M. Zafirovsky, R. Collins, B. Martin, V. Schluchter, M. Tamari, etc. [33, pp. 108–110].

Among the works of Russian scientists on this issue, it is necessary to highlight, first of all, the works of M.K. Gorshkov, who, within the framework of the mega-project of the study of modern Russian society, gave a deep analysis of the influence of non-economic factors on socio-economic development [9] and highlighted the socio-cultural vector of this influence [34].

Socio-cultural factors in human capital in the discourse of Russian modernization were investigated by N.I. Lapin [35]. Under his supervision, a unique project was carried out to develop and compile *The Atlas of Modernization of Russia and Its Regions*, with an original comprehensive analysis of socio-economic and socio-cultural trends and issues, which evoked a wide response in the scientific and academic community [36]. The specified work highlights issues typical of human capital at the new stage of exploration and development of Russia's Arctic zone, Extreme North, Far North and Near North.

When studying these problems, it is important to apply a geosystem approach put forward by V.N. Lazhentsev [37]; we use this approach congruently with our geo-socio-spatial methodology, in which, in addition to the study of subject-object relations in a certain geophysical (territorial) space, we investigate subject-subject relations between actors of certain social processes [38–41]. We were also interested in the ideas of N.Yu. Zamyatina and A.N. Pilyasov [42].

We took into account methodological specifics contained in the sociological analysis of the socio-cultural environment of a Northern region, presented, in particular, in the study by A.A. Shabunova and N.A. Okulova [43].

Having considered conceptual approaches, we can construct a design for the study of social practices of individuals that determine the formation and reproduction of human capital in the context of the Far North and the Arctic regions; the design allows us to identify how these practices have developed under the influence of socio-cultural factors, including attitudes and values learned earlier during socialization that stimulate and motivate individuals to take care of their health and education, appropriate investments, also related to the return on human capital and the real possibilities of converting it into income and socio-professional status.

The empirical basis for our research includes data of two mass sample surveys conducted with our direct participation almost simultaneously in the spring (March – May) of 2018 in two Arctic regions: the Arkhangelsk Oblast (in the territories included in the Arctic zone of the Russian Federation) and Yamalo-Nenets Autonomous Okrug (YNAO). At the same time, we assume that the Arctic territories of the Arkhangelsk Oblast (AO) represent a certain model of the western (European) part of the Russian Arctic, and Yamalo-Nenets Autonomous Okrug – the eastern (Ural-Siberian). The first survey within the framework of the research work "Monitoring the socio-psychological and socio-cultural situation

in the Arctic zone of the Russian Federation” was conducted among the population of six municipalities of the Arkhangelsk Oblast included in the Arctic zone of the Russian Federation (the cities of Arkhangelsk and Severodvinsk; the town of Novodvinsk; Onezhsky, Primorsky and Mezensky municipal districts). We used quota sample, representative by gender, age and area of residence; sample size $n = 407$ people; confidence interval $\leq 4.9\%$. In the second case, within the framework of the project of the Russian Foundation for Basic Research “Value and cognitive factors of entrepreneurial behavior of the population of the Arctic territories of Russia” (using the materials of the first survey and conducting its secondary analysis through targeted processing of primary data), the sample was expanded with the data from a new survey of 405 residents of the Arctic territories of the Arkhangelsk Oblast and 299 residents of Yamalo-Nenets Autonomous Okrug. As a result, with a stratified sample type, its total size was 704 people with a confidence interval of

$\leq 3.7\%$. The results were processed with the use of the SPSS program, separately for each region and for the total sample population. Comparing the results of the surveys with the data of state statistics and expert assessments allows us to draw substantiated conclusions about the problems under consideration.

In order to compare the features (indicators) of human capital with the financial situation of respondents, we conducted the procedure of self-assessment of the financial situation on a differentiated scale (*Fig. 1*).

The distribution closely correlates with statistical data and reflects significantly higher indicators of average per capita income and per capita GRP (*Tab. 3*).

The socio-professional structure of regional samples is shown in *Figure 2*. In this distribution among the respondents from Yamalo-Nenets Autonomous Okrug, in contrast to the Arkhangelsk Oblast, the proportion of those who identify themselves as pensioners is noticeably smaller,

Figure 1. Respondents' assessment of their financial situation, % for each group participating in the surveys

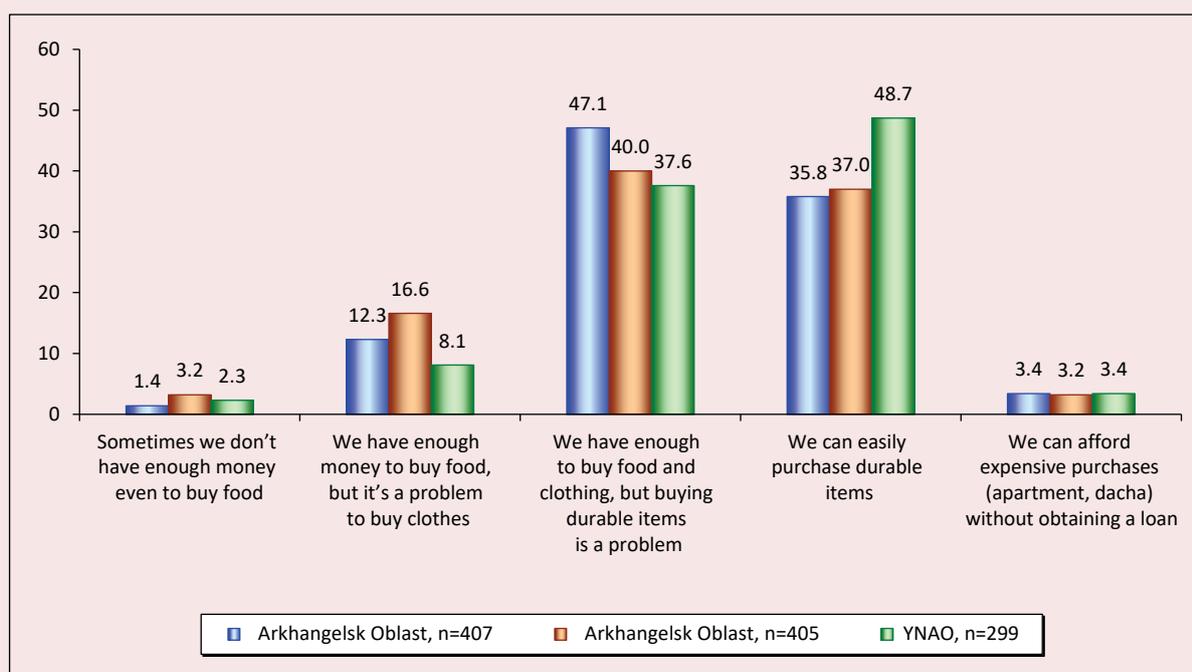
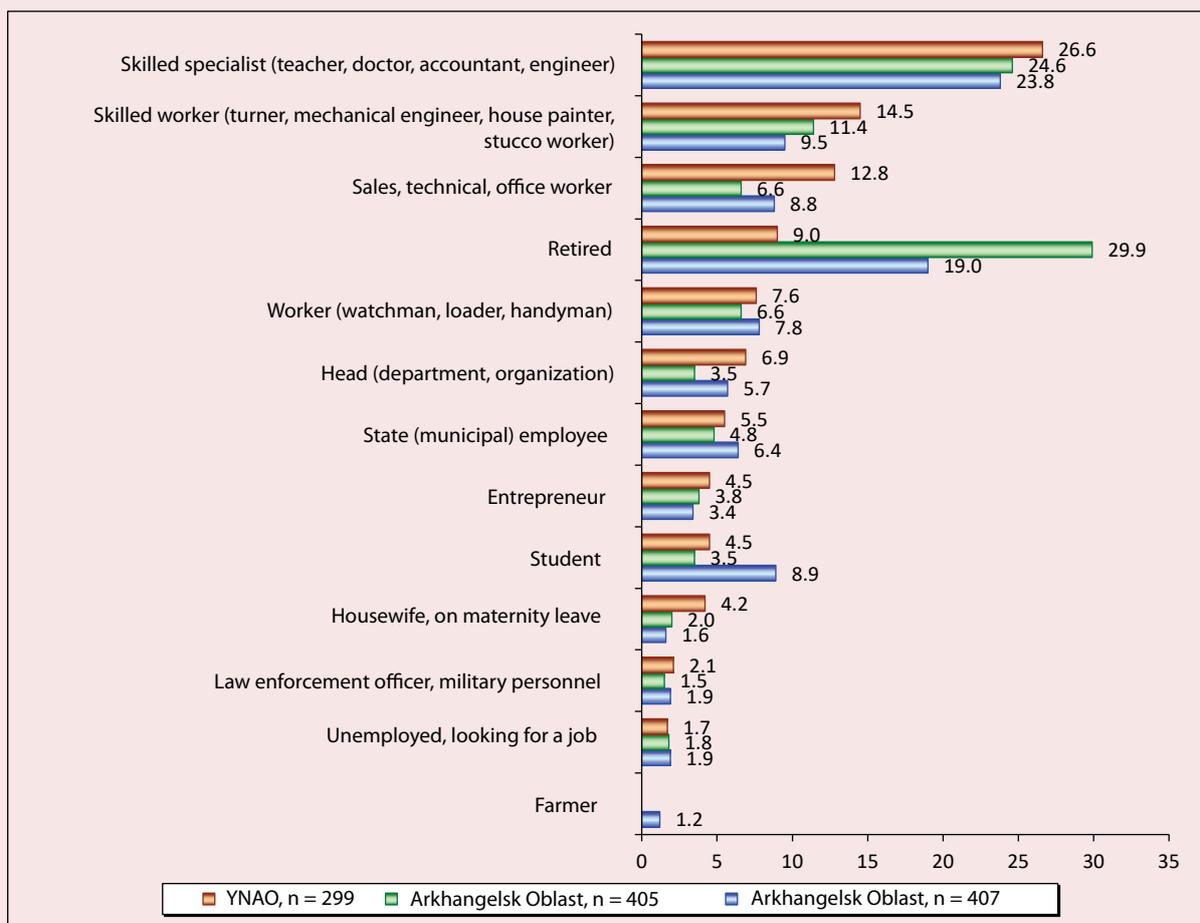


Table 3. Dynamics of average per capita GRP and income in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug

Per capita GRP, thousand rubles*					
Region	2014	2015	2016	2017	2018
Arkhangelsk Oblast (without NAO)	310.8	352.8	377.9	418.4	464.9**
Yamalo-Nenets Autonomous Okrug	3025.7	3336.5	3785.5	4581.2	5710.1***
Russia as a whole	405.2	449.1	472.1	510.3	no data
Average per capita monetary income, rubles****					
Arkhangelsk Oblast (without NAO)	28033	31114	31043	31705	31888
Yamalo-Nenets Autonomous Okrug	61252	66795	67521	71705	74304
Russia as a whole	27766	30467	30744	31367	32609

Sources: * Official website of the Federal State Statistics Service. National accounts. Gross regional product. Available at: http://old.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/accounts/#
 ** Official website of the Office of the Federal State Statistics Service for the Arkhangelsk Oblast and Nenets Autonomous Okrug. Available at: <https://arhangelskstat.gks.ru/grp11001>
 *** Yamalo-Nenets Autonomous Okrug in numbers (20152019): Concise statistics collection. Tyumen, 2020. 193 p. P. 8. Available at: https://tumstat.gks.ru/storage/mediabank/25159_2020.pdf
 **** Regions of Russia. Socio-economic indicators. 2017: Statistics collection. Rosstat. Moscow, 2017. 1402 p. Pp. 242–243; Official website of the Federal State Statistics Service. Average per capita monetary income broken down by constituent entity of the Russian Federation. Available at: https://www.gks.ru/free_doc/new_site/population/urow/urow_11sub.htm

Figure 2. Distribution of respondents by socio-professional status, % for each set of respondents



which can be explained by the spread of pensioner work in the Okrug, the widespread use of rotation system in hiring workers at large oil and gas producing enterprises located in the region, as well as the practice of pensioners moving to regions with a more favorable climate. In the remaining cohorts, the ratio of shares for similar socio-professional groups in different samples does not differ significantly. In addition, the incomparably smaller number of the disabled population in Yamalo-Nenets Autonomous Okrug, other things being equal, indirectly indicates the availability of a larger amount of the total human capital in the Okrug.

We point out that the official unemployment rates for the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug are several times higher (Tab. 4), than the share of the unemployed in our

samples. The difference is partly explained by the fact that people in this category, as a rule, are least likely to take part in opinion polls or indicate their status.

Thus, the design of our study unites theoretical approaches that include sensitive categories characterizing human capital (education, health, socio-professional status), which are quite easily quantifiable, with quantitative representations of categories characterizing value orientations and attitudes that are difficult to quantify and that require special valid scales and tools, among other things, in expressions and explanations of connections (relationships).

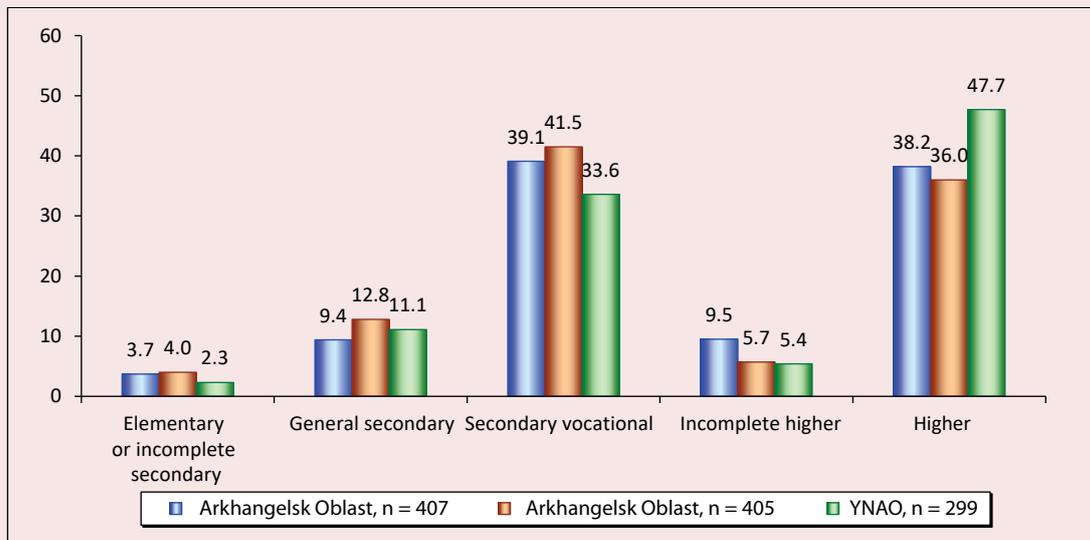
First-order results. Education, health, socio-professional status: How they are related in the sociological assessment of human capital in the Arctic regions

Table 4. Unemployment rate dynamics in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug, %

Region	2014	2015	2016	2017	2018
Arkhangelsk Oblast (without NAO)	7.3	6.8	7.1	6.4	6.3
Yamalo-Nenets Autonomous Okrug	3.1	3.6	2.6	3.2	2.1
Russia as a whole	5.2	5.6	5.5	5.2	4.8

Source: Official website of the Federal State Statistics Service. Labor market, employment and wages. Human resources. Unemployment rate broken down by constituent entity of the Russian Federation. Available at: http://www.gks.ru/free_doc/new_site/population/trud/tab_trud6.htm

Figure 3. Distribution of respondents by level of education, % for each set of respondents



Presenting an analytical review of statistically significant relationships based on the data obtained in our surveys, first of all, we shall briefly focus on the features of the distribution of educational statuses of respondents in the two Arctic regions. The frequency distribution for each of the samples is shown in *Figure 3*.

Among the respondents in both regions, there are more persons with secondary or higher professional education; this is mostly consistent with statistical data and fundamentally confirms the thesis about the high level of human capital in Russia as a whole and in the industrialized regions of the Russian Federation in particular. At the same time, the share of people with higher education in Yamalo-Nenets Autonomous Okrug is much higher than in the Arkhangelsk Oblast, despite the more developed educational infrastructure of the latter. Obviously, this also indicates the results

of cooperation between the authorities and the enterprises of the oil and gas industry, aimed at effective reproduction of high-quality human capital in the Okrug.

At the same time, education, although it is an important component of human capital, implies the presence of interrelations with its other components, which makes it necessary to identify and, if possible, measure them. Identification and measurement of statistically significant relationships (dependencies) between variables should reflect the results of investments in educational capital, health capital, as well as relevant indicators of return on human capital (income level measured through self-assessment of financial status and socio-professional status). Our data characterize these dependencies very ambiguously. *Table 5* shows that although there is a statistically significant relationship ($p < 0.01$) between self-assessments of financial situation and

Table 5. Relationship of self-assessment of financial situation with the level of education of respondents, Arkhangelsk Oblast, n = 407*

		Self-assessment of financial situation			Total	
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items		
Education level	General secondary	Frequency	6	17	12	35
		%	17.1	48.6	34.3	100.0
	Secondary vocational	Frequency	32	77	46	155
		%	20.6	49.7	29.7	100.0
	Incomplete higher	Frequency	4	15	16	35
		%	11.4	42.9	45.7	100.0
	Higher	Frequency	5	69	68	142
		%	3.5	48.6	47.9	100.0
Total		Frequency	47	178	142	367
		%	12.8	48.5	38.7	100.0

*Hereinafter, we compiled the tables on the basis of statistical analysis of the survey materials. In Tables 5–6, groups of respondents with the most rarely occurring, extreme values of the conjugated variables are excluded from the analysis in order to increase the reliability of the chi-squared test, which reveals the presence/absence of a significant relationship between two variables. For the variable “self-assessment of financial situation”, these values characterize the least and most affluent, for the variable “education level” – persons with incomplete secondary education.

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	24.817	6	0.000
Phi	0.260		0.000
Cramér's V	0.184		0.000

the level of education of residents of the Arctic territories of the Arkhangelsk Oblast ($n = 407$), it is very weak (Cramér's $V < 0.2$): respondents with higher education assess their financial situation as being good, among them there is a greater proportion of people with incomes above average. However, regardless of the level of education, almost half of all respondents have average income.

Table 6 shows that in another sample of respondents ($n = 405$) from the Arkhangelsk Oblast there is a weak connection ($p > 0.05$). At the same time, such a connection was found for Yamalo-Nenets Autonomous Okrug (Cramér's $V \approx 0.2$): respondents with higher education were twice as likely to note that their income is above average,

compared with respondents with general secondary education alone. In this case, it is quite possible to assume that if vocational education helps receive higher income, then it happens in the presence of additional factors that are associated with the structural features of the labor market, in particular, greater or lesser demand for skilled labor. It is obvious that the "overproduction" of specialists with higher education also has its implications in the Russian context. At the same time, in the modern situation, when education investments, both public and personal, do not endow individuals with special competitive advantages in the labor market and do not help them receive high incomes, the continuing significant demand for higher education services

Table 6. Relationship between self-assessment of financial situation and the level of education in respondents, %
Arkhangelsk Oblast, $n = 405$; Yamalo-Nenets Autonomous Okrug, $n = 299$

		Self-assessment of financial situation			
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items	
Arkhangelsk Oblast	Education level	General secondary	19.6	45.7	34.8
		Secondary vocational	20.5	39.1	40.4
		Incomplete higher	21.7	30.4	47.8
		Высшее	12.3	44.9	42.8
	Total	17.4	41.6	41.0	
Yamalo-Nenets AO	Education level	General secondary	7.1	64.3	28.6
		Secondary vocational	11.2	48.0	40.8
		Incomplete higher	0.0	37.5	62.5
		Higher	7.5	28.6	63.9
	Total	8.4	39.6	52.0	

Arkhangelsk Oblast	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	5.581	6	0.472
Phi	0.124		0.472
Cramér's V	0.088		0.472
Yamalo-Nenets AO	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	21.872	6	0.001
Phi	0.282		0.001
Cramér's V	0.199		0.001

Table 7. Relationship between self-assessments of the financial situation and physical health of respondents, Arkhangelsk Oblast, n = 407*

		Self-assessment of financial situation			Total	
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items		
Self-assessment of physical health	Good	Frequency	15	50	62	127
		%	11.8	39.4	48.8	100.0
	Sooner good	Frequency	11	104	59	174
		%	6.3	59.8	33.9	100.0
	Sooner poor	Frequency	12	23	14	49
		%	24.5	46.9	28.6	100.0
	Poor	Frequency	4	2	5	11
		%	36.4	18.2	45.5	100.0
Total		Frequency	42	179	140	361
		%	11.6	49.6	38.8	100.0

* In Tables 7–10, when calculating the chi-square, for its greater reliability, groups of respondents with the most rarely occurring, extreme values of conjugated variables were excluded from the analysis. For the variable “self-assessment of financial situation”, these values characterize the least and most affluent, for the variable “self-assessment of mental health” – people who have an extremely low estimate of their emotional and/or mental state.

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	31.345	6	0.000
Phi	0.295		0.000
Cramér's V	0.208		0.000

Table 8. Relationship between self-assessments of the financial situation and mental health of respondents, Arkhangelsk Oblast, n = 407

		Self-assessment of financial situation			Total	
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items		
Self-assessment of mental health	Good	Frequency	16	75	72	163
		%	9.8	46.0	44.2	100.0
	Sooner good	Frequency	23	95	53	171
		%	13.5	55.6	31.0	100.0
	Sooner poor	Frequency	5	11	12	28
		%	17.9	39.3	42.9	100.0
Total		Frequency	44	181	137	362
		%	12.2	50.0	37.8	100.0

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	7.966	4	0.093
Phi	0.148		0.093
Cramér's V	0.105		0.093

shows, rather, the attitude of Russians toward it – from a utilitarian means to ensure material and financial well-being in the future, it has turned into an independent cultural value, an obligatory component of average cultural capital (in the sense in which P. Bourdieu interpreted it).

Tables 7, 8 show the values of the variables of physical and mental health, on the one hand, and self-assessment of the financial situation, on the other³. Here it is obvious that there is a statistically significant relationship between respondents' assessment of their physical health and the assessment of their financial situation: among people with good health, the proportion of people with medium and high incomes is higher; while among people with low incomes, the proportion of those who have poor health is higher. It is a direct illustration of the fact that "it is better to be rich and healthy than to be poor and sick". But at the same time, it would be an unjustly narrow viewpoint to see only a direct dependence of material well-being on physical health, since poor health can be not only a cause (diseases lead to a decrease in working capacity and, thus, a decrease in income), but also

a consequence of a low standard of living (poverty contributes to the deterioration of health due to poor nutrition, poor living conditions, unavailability of medical services and wellness procedures). As for the mental health of residents of the Arctic territories of the Arkhangelsk Oblast, according to the data provided, it is statistically associated with the self-assessment of their financial situation very weakly ($p > 0.05$). The explanation for this can be twofold: either the respondents underestimate the importance of their mental health, or the "harsh northern character" organically implies mental stability, etc.

The most significant, as expected, were the interrelations of socio-professional status and the level of education (*Tab. 9, 10*). The data on all three samples indicate that belonging to certain socio-professional groups that differ not only in the content of work and qualification requirements, but also in status, is largely determined by formal, including specialized, education. Among respondents with secondary education, representatives of groups with a relatively low status in the system of socio-professional stratification

Table 9. Relationship between the level of education of the respondents and their belonging to a socio-professional group, Arkhangelsk Oblast, n = 407, % by column

What socio-professional group do you identify with?	Education level			Total
	General secondary	Secondary vocational	Higher	
Unskilled worker	41.4	11.4	0.0	9.3
Skilled worker	17.2	20.7	2.3	12.3
State (municipal) employee	10.3	6.4	9.9	8.3
Sales, technical, office worker	10.3	15.0	4.6	10.0
Qualified specialist	0.0	16.4	54.2	31.3
Head (departments, organizations)	6.9	0.0	14.5	7.0
Retired	13.8	30.0	14.5	21.7

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	142.174	12	0.000
Phi	0.688		0.000
Cramér's V	0.487		0.000

³ Since no questions about physical and mental health were asked during the survey within the framework of the project "Value-based and cognitive drivers of entrepreneurial behavior of the population of the Arctic territories of Russia", the text contains the results of the analysis concerning only the Arctic territories of the Arkhangelsk Oblast (n = 407).

Table 10. Relationship between the respondents' level of education and their belonging to a socio-professional group, Arkhangelsk Oblast, n = 405; Yamalo-Nenets Autonomous Okrug, n = 299, % by column

What socio-professional group do you identify with?	Education level							
	Arkhangelsk Oblast				Yamalo-Nenets AO			
	General secondary	Secondary vocational	Higher	Total	General secondary	Secondary vocational	Higher	Total
Unskilled worker	20.5	7.6	0.8	6.4	26.9	12.0	2.6	8.9
Skilled worker	12.8	18.8	2.3	11.1	15.4	31.3	5.2	16.0
State (municipal) employee	5.1	2.8	9.2	5.7	7.7	4.8	7.8	6.7
Sales, technical, office worker	10.3	9.7	3.1	7.0	11.5	19.3	13.8	15.6
Qualified specialist	7.7	18.8	48.1	29.6	15.4	14.5	50.9	33.3
Head (departments, organizations)	2.6	1.4	8.4	4.5	0.0	3.6	13.8	8.4
Retired	41.0	41.0	28.2	35.7	23.1	14.5	6.0	11.1

Arkhangelsk Oblast	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	84.346	12	0.000
Phi	0.518		0.000
Cramér's V	0.366		0.000
Yamalo-Nenets AO	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	75.605	12	0.000
Phi	0.580		0.000
Cramér's V	0.410		0.000

(unskilled workers, to a lesser extent – skilled workers) have the largest share. In the group of people with secondary vocational education, skilled workers predominate in all samples. There are also significant shares of low-skilled workers in the service sector and qualified specialists (doctors, engineers, teachers, etc.), who are distinguished by a higher status associated with higher qualifications and the intellectual nature of work. In the group of respondents with higher education, there is a predominance of qualified specialists (more than half of the number of respondents), as well as the largest proportion of managers who, respectively, have the highest status in the socio-professional hierarchy. Thus, it turns out that the return on investment in educational capital is much more evident in the levels of socio-professional stratification than in income levels.

Tables 11–12⁴ reflect the relationship between socio-professional status and health. There is a statistically significant relationship between physical health and belonging to a certain socio-professional group, but it manifests itself as very weak ($p > 0.05$), if we do not take into account cases when respondents chose the “poor” option.

As for mental health, we have also revealed the presence of a weak relationship between the variables under consideration. At the same time, on the one hand, among those who assessed their emotional and psychological state as good, the proportion of unskilled workers (low-status group) is quite high (above the average in the sample); on the other hand, the same situation is typical of managers (high-status group). However, the

⁴ Data only for the Arctic territories of the Arkhangelsk Oblast.

Table 11. Relationship between self-assessments of respondents' physical health and belonging to a socio-professional group, Arkhangelsk Oblast, n = 407, % by column

What socio-professional group do you identify with?	Self-assessment of physical health			Total
	Good	Sooner good	Sooner poor	
Unskilled worker	10.4	9.1	13.0	10.1
Skilled worker	17.7	11.0	4.3	12.2
State (municipal) employee	5.2	11.0	8.7	8.8
Sales, technical, office worker	12.5	11.7	10.9	11.8
Qualified specialist	27.1	31.8	26.1	29.4
Head (departments, organizations)	11.5	6.5	4.3	7.8
Retired	15.6	18.8	32.6	19.9

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	15.865	12	0.198
Phi	0.232		0.198
Cramér's V	0.164		0.198

Table 12. Relationship between self-assessments of respondents' mental health and belonging to a socio-professional group, Arkhangelsk Oblast, n = 407, % by columns

What socio-professional group do you identify with?	Self-assessment of mental health			Total
	Good	Sooner good	Sooner poor	
Unskilled worker	13,0	8,0	7,7	10,1
Skilled worker	12,2	13,3	3,8	12,1
State (municipal) employee	4,6	10,0	15,4	8,1
Sales, technical, office worker	10,7	11,3	11,5	11,1
Qualified specialist	33,6	27,3	23,1	29,6
Head (departments, organizations)	12,2	2,7	3,8	6,8
Retired	13,7	27,3	34,6	22,1

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	26,774	12	0,008
Phi	0,295		0,008
Cramér's V	0,209		0,008

share of another high-status socio-professional group – state and municipal employees – in the total array increases as the self-esteem of mental health decreases. With such a nonlinear relationship of variables, we can assume that one of the factors influencing the assessment of mental health is risk-taking, the presence of stress at work, etc.

It follows from the above data that the statistically significant dependence of at least one of the parameters for assessing the return on investment on human capital is caused only by the level of education, and this is most evident in the influence on belonging to socio-professional groups with a certain rank of status: the higher

the level of education, the more the proportion of representatives of high-status socio-professional groups increases.

Second-order results. Value orientations in the socio-cultural foundations of the reproduction of human capital in the Arctic regions

A number of the concepts mentioned above contain statements about the influence of attitudes and value orientations on the basic patterns of economic behavior. The main postulate in this regard is the thesis that value orientations and personal qualities formed under their influence contribute to the formation of such behaviors that allow achieving the desired level of material well-being and the corresponding status in the system of socio-professional stratification.

The analysis of the empirical material we have obtained basically confirms the hypothesis that value orientations can be drivers of the reproduction of human capital (efforts to improve the educational level and maintain health) and conditions for its rational and effective use (conversion of human capital into income and status). However,

such influence is not direct or strictly defined. Rather, sociocultural factors in general and value orientations in particular are ambivalent in relation to human capital.

In order to identify the role of value orientations in the formation and reproduction of human capital, we used the approach of M. Rokeach, which involves the allocation of values of two classes: terminal, reflecting the target attitudes of individuals (what they want to achieve), and instrumental, through which the idea of the approved means of achieving goals is expressed. This approach was adapted to the Russian context by A. Goshtaus, A. Semenov, V. Yadov, and then N.I. Lapin et al. [37; 44, pp. 262–264].

The use of this approach in surveys of residents of the Arctic territories of the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug produced the following distributions (*Tab. 13, 14*). The data show that the dominant sets of terminal values (in their upper positions) in the two regions are almost identical, and the differences in averages are statistically insignificant (see *Tab. 13*).

Table 13. Average values of respondents' adherence to terminal values, points on a five-point scale

Terminal value	Arkhangelsk Oblast (n = 405)	Yamalo-Nenets AO (n = 299)
Creativity, hobbies	4.28	4.36
Family and children	4.87	4.94
Love, relationships	4.63	4.66
Health	4.85	4.91
Harmony with the surrounding world	4.52	4.62
Public recognition	3.77	3.81
Financial security	4.44	4.51
Personal safety and the safety of loved ones	4.85	4.93
Active life	4.33	4.45
Pleasure, entertainment	3.77	3.79
Life wisdom	4.59	4.64
Peaceful life	4.78	4.88
Order and stability	4.72	4.82
Improving education and general culture	4.53	4.76
Freedom, independence	4.60	4.68
Equality and justice	4.62	4.67
Beauty of nature and works of art	4.60	4.58
Interesting job	4.57	4.77

Table 14. Average values of respondents' adherence to instrumental values, points on a five-point scale

Instrumental value	Arkhangelsk Oblast (n = 405)	Yamalo-Nenets AO (n = 299)
Good manners, politeness	4.81	4.86
Neatness	4.64	4.72
Cheerfulness	4.59	4.59
Demanding of oneself and others	4.47	4.44
Ambition, the desire to succeed	4.12	4.21
Diligence, conscientious attitude toward duties	4.82	4.87
Independence, independence	4.53	4.64
Education, extensive knowledge	4.61	4.74
Responsibility	4.87	4.93
Prudence, sanity	4.75	4.84
Restraint, self-control	4.70	4.77
Courage, determination	4.53	4.60
Perseverance, firmness of character	4.45	4.51
Tolerance of other people's views, lifestyle	4.24	4.25
Honesty	4.83	4.84
Ability to understand and respect someone else's point of view	4.70	4.71
Diligence, efficiency	4.80	4.83
Sensitivity, caring	4.70	4.77

The hierarchy of instrumental values turned out to be close to the above, with relatively small differences (see Tab. 14). This provides a basis for analyzing samples for both regions in a single array.

The analysis of correlations between terminal and instrumental values, on the one hand, and indicators of material well-being and socio-professional status, on the other, has shown that there are few statistically significant relationships ($p \leq 0.05$) between the two groups of variables and they are all very weak (Tab. 15). It turns out that in this case, the values of both classes have practically no direct and immediate impact on the conversion of human capital into material well-being and socio-professional achievements.

The ideas about value orientations as drivers of investment in human capital – both in health and in education – look more solid. Moreover, the terminal values include health and education, and

the instrumental values include such values that seem important for successful advancement in society and at work (“diligence, conscientious attitude toward duties”, “responsibility”, “diligence/efficiency”, “ambition”).

Table 16 shows contingency coefficients for statistically significant ($p \leq 0.05$) relationships between the values allocated and the level of education (in the framework of the survey, on the basis of which the analysis is carried out, no questions about self-assessment of health were asked). It is quite expected that such values included “improving education and general culture”, “public recognition”, “financial security”, with a very weak relationship between independent and dependent variables (Cramér's $V < 0.2$). As in the case of the level of education, there is no significant influence of adherence to certain value orientations, although, according to the assumption, some of them should directly stimulate and motivate individuals to

Table 15. Relationship between the degree of adherence to terminal and instrumental values, self-assessment of financial situation and socio-professional status in the total number of respondents in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704*)

	Self-assessment of financial situation	Socio-professional status
Terminal value		
Financial security		$\chi^2 = 0.031$ Cramér's V = 0.152
Pleasure, entertainment		$\chi^2 = 0.004$ Cramér's V = 0.179
Personal safety and the safety of loved ones	$\chi^2 = 0.025$ Cramér's V = 0.0116	
Instrumental value		
Courage, determination	$\chi^2 = 0.025$ Cramér's V = 0.125	$\chi^2 = 0.001$ Cramér's V = 0.186
Tolerance of other people's views, lifestyle	$\chi^2 = 0.004$ Cramér's V = 0.130	
Restraint, self-control	$\chi^2 = 0.047$ Cramér's V = 0.109	
Perseverance, firmness of character	$\chi^2 = 0.000$ Cramér's V = 0.147	
Diligence, efficiency	$\chi^2 = 0.004$ Cramér's V = 0.131	
* Unified array for Yamalo-Nenets Autonomous Okrug and Arctic municipalities of the Arkhangelsk Oblast.		

Table 16. Relationship between the degree of adherence to terminal and instrumental values and the educational level of respondents in the total amount of respondents in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704)

	Education level
Terminal value	
Financial security	$\chi^2 = 0.003$ Cramér's V = 0.124
Family and children	$\chi^2 = 0.009$ Cramér's V = 0.113
Health	$\chi^2 = 0.027$ Cramér's V = 0.103
Public recognition	$\chi^2 = 0.007$ Cramér's V = 0.122
Improving education and general culture	$\chi^2 = 0.005$ Cramér's V = 0.119
Instrumental value	
Diligence, conscientious attitude toward duties	$\chi^2 = 0.000$ Cramér's V = 0.137

receive professional education, including higher education. The explanation for such an unexpected “smoothing” may be initially very high average indicators of all values for which a sufficiently strong relationship with the level of education has been confirmed (except for “public recognition”).

It has been of interest to consider the connection of terminal and instrumental values with the propensity (positive attitude as a source of motivation) to entrepreneurial activity. To identify this propensity and the corresponding grouping of respondents, we used answers to the question “Have you ever thought about starting your own business?”: 1) those who have opened their own business (“entrepreneurs”), 2) those who are thinking about opening their own business (“potential entrepreneurs”), 3) those who have not thought about it (“non-entrepreneurs”).

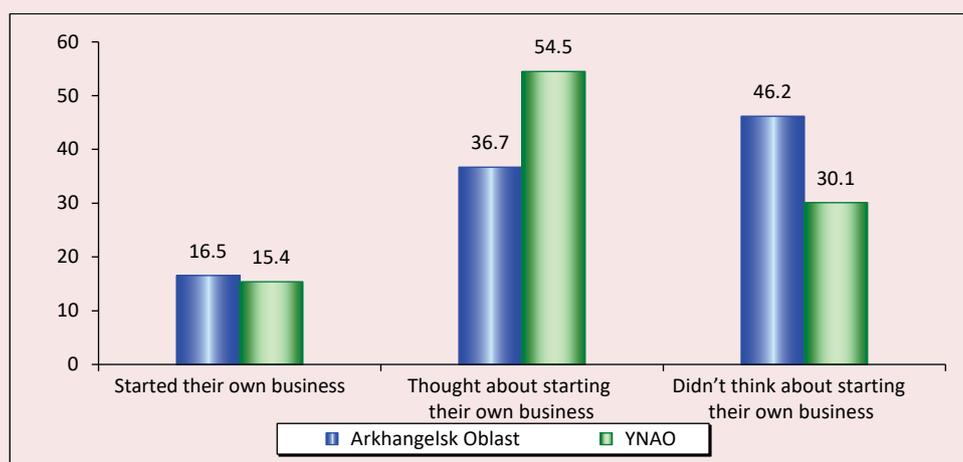
The specifics of the system of value orientations were determined for each group. At the same time, the differences between the groups were identified on the basis of the empirical data obtained and did

not involve a comparison of the value system of the first group of respondents (entrepreneurs) with some value profiles (models) of a “typical entrepreneur” claiming to be universal, which are presented in literature [45, pp. 8–10].

The distribution of respondents in three constructed groups (*Fig. 4*) shows a greater potential for entrepreneurship in Yamalo-Nenets Autonomous Okrug; however, the proportion of those who identified themselves as active entrepreneurs (taking into account sampling error) in both regions is approximately the same.

If we take into account (as shown above, see Tab. 13, 14) that there are no significant differences in the hierarchies of values among residents of the two regions, then the differences in the propensity for entrepreneurship (potential) are due to some special circumstances, for example, a more favorable investment climate, institutional and infrastructural positions for small and medium-sized businesses in Yamalo-Nenets Autonomous Okrug compared to the Arkhangelsk Oblast⁵.

Figure 4. Distribution of respondents into groups with different propensity for entrepreneurship in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704), % of the total number of respondents



⁵ Seventh annual rating of investment attractiveness of Russian regions for 2019. *National Rating Agency*. Available at: http://www.ra-national.ru/sites/default/files/Obzor_Rating_Investment_Regions_VII_2020.pdf

Table 17. Indices of attitude toward terminal and instrumental values among respondents in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704) according to the results of the discriminant analysis

Value	Wilks' λ^*	F**
Arkhangelsk Oblast		
Career success	0.97	5.41
Improving education and general culture	0.98	4.06
Ambition, the desire to succeed	0.97	6.71
Yamalo-Nenets Autonomous Okrug		
Career success	0.98	3.48
Beauty of nature and works of art	0.98	3.02
Interesting job	0.99	3.11
Ambition, the desire to succeed	0.96	6.00
*Indicator of the ratio of the measure of intra-group variability to the measure of overall variability.		
**Indicator of the ratio of the average square between groups to the average square within the group.		

Returning to the question of differences in values between regional groups of respondents (including the latent influence of those inclined to entrepreneurship in both samples), we should note that the targeted discriminant analysis we conducted on this occasion has shown their very significant convergence (*Tab. 17*; only those terminal and instrumental values whose differences are statistically significant are presented, $p \leq 0.05$).

Despite the fact that the groups of respondents differ from each other in the degree of commitment to these values (earlier we noted that commitment to these values increases along with the propensity for entrepreneurship), the target indicator of Wilks' lambda is close to 1, which means a very weak degree of discrimination on the selected variables. Thus, although there is a difference in values between entrepreneurs and people who are not inclined to such activities, this difference is not decisive in choosing the form of economic activity. Obviously, certain conditions that favor or hinder a particular choice can play a much more significant role.

Discussion of the results

The analysis of empirical material obtained in the course of mass sample surveys allows us to point out the ambivalent nature of the manifestation of

socio-cultural factors in relation to the human capital of the Northerners. These factors can act both as foundations and as components of this form of capital. The connection between education and socio-professional status is most pronounced. It is very linear, since it is the increase in the level of education that is a direct factor contributing to the improvement of the socio-professional status, and not vice versa. The influence of the educational level on socio-professional advancement in the Arctic regions is enhanced, first of all, due to the neo-industrial vector of development (especially in Yamalo-Nenets Autonomous Okrug) in extreme natural and climatic conditions that require special qualities of human capital in general, good health and vocational education in particular. In addition, education is directly related to cultural capital, is part of the socio-cultural potential of the worker, and represents the basic universals for continuing education, including advanced training and retraining.

At the same time, the hypothesis about the relationship between the results of investments in human capital (indicators were the educational level and self-assessment of health) and the level of financial well-being (indicator: self-assessment of household income) was confirmed only partially.

A stable connection between financial well-being and physical health has been revealed, but the strength of the connection is low, and its nature is very ambiguous: higher incomes can be obtained as a result of higher productivity, which is promoted by good health, but there is another, opposite option – low incomes can lead to health deterioration. In Arctic conditions, the first trend prevails, although a certain part of the population (up to 20–25%) is openly or latently in the second one. The second trend is less typical of Yamalo-Nenets Autonomous Okrug, non-indigenous residents of such low-status categories are being “gently” pushed out of the region.

We have obtained a solution to one the main questions in our study – regarding the influence of value orientations on economic behavior patterns: a statistically significant relationship was found between individual value orientations (both terminal and instrumental) and variables reflecting the income, status and education of respondents, but it would still be an unjustified reduction to assert that it is the very values that have a direct impact on all other parts (components) of human capital and its conversion into material and status-related positions of an individual. Research indicates that the impact of socio-cultural factors is fundamental and profound. In the conditions of the Arctic regions, factors related to the spatial mainstream, market conditions, institutional formats, northern infrastructure and other parameters of the political and economic system are of particular importance in these

processes (starting with natural and climatic and ending with socio-psychological ones) in relation to individuals, their groups and the cultural environment in which they were socialized.

Also, the question of the ratio of individual, corporate and public investments in human capital and its individual parts remains very important. In Russian conditions, with the highest degree of social inequality, very few strata have the possibility of sufficient individual investments in human capital. In our study, they are represented by wealthy entrepreneurs, highly qualified specialists and managers, characterized by the greatest human capital in all respects. The group of state (municipal) employees increases their high-quality human capital mainly at the state expense. All other groups have very modest opportunities to receive “start-up” capital in general and vocational schools, a minimum of medical services and some social benefits for certain categories of the poor in budgetary public services. All further growth is provided at best by corporations; in the Arctic and other raw materials-based regions this is the most promising option. Many other organizations do not have such capabilities. Thus, the majority of low-income workers have to deal with a vicious circle of simple reproduction and use of their human capital, which is often reduced to the price (cost) of workforce. It is necessary to break this vicious circle through multi-channel financing, stimulation and motivation for the growth of human capital and its effective use in the digital economy: high-tech industries and services.

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