The correlation of the values and hardiness of the inhabitants of northern Russia

N V Sivrikova¹, M I Postnikova²

¹South Ural State Humanitarian Pedagogical University Chelyabinsk, Chelyabinsk, Russia
²Northern (Arctic) Federal University named after M.V. Lomonosov Arkhangelsk, Russia

bobronv@cspu.ru

Abstract. The study examines the correlation between value orientations and hardiness in the context of human capital development in the Arctic. Hardiness is one of the factors of resistance to stress and life difficulties. It plays an important role in the survival and maintaining a high level of efficiency in the conditions of northern Russia. The purpose of this research was to study correlations between value orientations and the level of hardiness of residents of northern Russia. The sample was 171 residents of Arkhangelsk. The Terminal Values Questionnaire, Sch. Schwartz's questionnaire (adapted by V. N. Karandashev) and the «Hardiness Survey» (adapted by D.A. Leontiev) were used to collect empirical data. The results of the study showed a correlation between pragmatic values and the level of hardiness. A correlation of the level of hardiness with the values of public life was established too. A regression model built on empirical evidence showed low potential in predicting the level of hardiness of value orientations such as spiritual satisfaction and own prestige. The authors concluded that value orientations are one of the factors of the level of hardiness, as they can explain only 18% of the variance of this variable.

1. Introduction
The task of developing human capital in the Arctic requires special attention to the factors of stress resistance of the individual. Modern psychological concepts view the peculiarities of perception of situations and life as an important element of stress resistance. They are based on the idea that the response to any life difficulties is mediated by the peculiarities of subjective perception of the situation and assessment of its consequences for the person. Therefore, for health, it is less important in how difficult conditions a person lives and works, and more importantly how he perceives these conditions.

Cognitive factors that help overcome stress are considered within the framework of positive psychology. Hardiness is such a factor [1].

The term hardiness was introduced by S. Maddi. This term refers to an internal resource and personality trait that reduces the negative impact of life difficulties on a person ‘s physical and mental health [2], [3]. There are other terms to refer to a similar psychological phenomenon. For example, «mental toughness» [1] and «psychological resilience» [3]. The concept of hardiness focuses on the idea of the optimal use of a person ‘s psychological resources in difficult life situations. Researchers agree that the ability to confront difficulties is determined by three personality settings: challenge, control, and commitment [1], [2], [4].
Relevant issues in the study of hardiness in the context of human capital development in the Arctic remain: 1) hardness to mitigate the negative impact of harsh living and working conditions (e.g. in the north); 2) Identification of personality determinants of hardness (e.g. value orientations).

Studies of Russian and foreign scientists have shown that hardiness is a key personal variable, mediating the influence of stress factors on somatic and mental health, as well as affecting the success of activities [5], [6], [7], [8], [9], [10]. It has been proved that being positive even in a traumatic situation contributes to the growth of physical health and well-being of the person [7], [8], [11].

In S. Maddi’s concept, hardiness is a set of beliefs about himself, about the world around him, about relations with world [12]. Such a set of beliefs is especially relevant for people who live and work in harsh conditions, for example in the northern regions of Russia. Hardiness components prevent the creation of internal stress arising in stressful situations by sustainably countering stresses and perceiving them as less important [5]. Hardiness is a protective mechanism that is triggered when faced with negative life events or adverse living conditions [13].

The three hardiness settings complement each other. Together, they form a disposition that helps reduce and more easily carry the ontological anxiety associated with choosing the future. High commitment implies active participation in everything that happens. The manifestation of control is reflected in the conscious establishment that by fighting it is possible to influence the consequences of the events. Challenge is expressed in a desire to survive one’s own experience, whether positive or negative [1].

Theoretical analysis of the problem of hardiness allowed us to form the necessary base for its empirical study. Over the past 30 years, foreign researchers have shown that hardiness provides existential courage and motivation to turn stressful circumstances from potential disasters into growth opportunities [12]. In domestic science, much attention is paid to the analysis of hardiness in the context of the values of the individual [14], [15], [16] and meaning of life orientations [17].

However, empirical studies of the correlation between hardiness and value orientations are not enough. This is because researchers concentrate on a senile period to shape values: adolescence [14] and youthful age [15], [17]. Such studies do not make it possible to speak about the role of values in shaping the hardiness of people living in difficult climatic conditions. Therefore, in our study, we turned to the analysis of the correlation between hardiness and value orientations of people living in the harsh conditions of northern Russia.

2. Research method
The aim of the study was to identify the correlation between the level of hardiness and the value orientations of the inhabitants of northern Russia. 171 people participated in the study. Of these, 95 are women and 76 are men between the ages of 16 and 67. The participants of the study are residents of Arkhangelsk (Russia).

The level of hardiness was studied with the help of the Russian version of the "Hardiness Survey" adapted by D.A. Leontiev. The values were determined using the following techniques: 1) Terminal Values Questionnaire; 2) S. Schwartz questionnaire adapted by V. N. Karandashev.

The following methods were used for mathematical processing of the results of the study: Pearson correlation analysis and multiple-step regression analysis. Statistical processing was performed in IBM SPSS 23. Pajek was used to build the correlation arm system.

3. Results
Analysis of the hardiness features of the study participants showed (Table 1) that the sample mean and standard deviations were similar to the values obtained during the standardization of the "Hardiness Survey" [4], [5]. They were different from the data obtained from the sample of youth age [9]. Such differences confirm the dependence of the level of hardiness on the age factor, which has been established by many researchers [5], [18].


Table 1. Level of the hardiness of residents of northern Russia (points)

| scales          | Number | Average Value | Standard deviation | Asymmetry | Kurtosis |
|-----------------|--------|---------------|--------------------|-----------|----------|
| Hardiness       | 171    | 83.6          | 19.3               | -0.204    | -0.593   |
| Commitment      | 171    | 37.9          | 8.3                | -0.591    | -0.023   |
| Control         | 171    | 29.5          | 8.6                | -0.117    | -0.516   |
| Challenge       | 171    | 16.3          | 5.3                | -0.270    | -0.354   |

Analysis of the significance of motivational value types by Sch. Schwartz (Table 2) showed that the profile of values of the study participants is dominated by orientation towards understanding, tolerance, and protection of the well-being of all living on earth (universalism). Trends aimed at preserving and improving the well-being of loved ones (kindness) and the desire for independence of thoughts and actions (autonomy) have been expressed. This may indicate openness and a desire to go beyond his «Self».

Table 2. Profile of values of residents of northern Russia (points)

| Values          | Number | Average Value | Standard deviation | Asymmetry | Kurtosis |
|-----------------|--------|---------------|--------------------|-----------|----------|
| conformity      | 171    | 18.69         | 5.18               | -0.91     | 0.75     |
| traditions      | 171    | 20.44         | 6.66               | -0.46     | 0.21     |
| kindness        | 171    | 23.99         | 6.22               | -0.74     | 0.46     |
| universalism    | 171    | 36.96         | 9.53               | -0.62     | 0.57     |
| independence    | 171    | 23.49         | 5.76               | -0.54     | 0.14     |
| stimulation     | 171    | 11.97         | 4.28               | -0.21     | -0.28    |
| hedonism        | 171    | 12.46         | 4.84               | -0.81     | 0.42     |
| achievements    | 171    | 17.98         | 4.57               | -0.75     | 1.60     |
| power           | 171    | 13.17         | 4.97               | 0.23      | 0.10     |
| safety          | 171    | 26.21         | 5.51               | -1.31     | 1.56     |

The structure of the terminal values of the study participants is dominated by orientations on spiritual satisfaction, achievements and high material position (Table 3). Orientations to one 's own prestige and creativity were the least significant among the values studied in the sample studied.

Table 3. Value orientations of residents of northern Russia (points)

| Value orientations       | Number | Average Value | Standard deviation | Asymmetry | Kurtosis |
|--------------------------|--------|---------------|--------------------|-----------|----------|
| own prestige             | 171    | 27.38         | 6.96               | -0.16     | 0.02     |
| high financial position  | 171    | 32.50         | 7.17               | -0.38     | 0.04     |
| creativity               | 171    | 29.77         | 6.82               | -0.23     | -0.03    |
| active social contacts   | 171    | 30.53         | 6.60               | -0.26     | -0.20    |
| self-development         | 171    | 31.70         | 6.57               | -0.35     | 0.31     |
| achievements             | 171    | 32.41         | 6.19               | -0.04     | 0.03     |
| spiritual satisfaction   | 171    | 35.40         | 5.53               | -0.31     | 0.20     |
| maintaining identity     | 171    | 30.76         | 6.59               | -0.29     | 0.47     |
According to the average sample trends, the most significant values for the study participants are presented in the professional, educational and family life sectors (table 4).

**Table 4.** Representation of terminal values in different spheres of life of residents of northern Russia (points)

| Spheres of life      | Number | Average Value | Standard deviation | Asymmetry | Kurtosis |
|----------------------|--------|---------------|--------------------|-----------|----------|
| Professional life    | 54.29  | 9.69          | -0.519             | 0.819     |          |
| Training and education | 52.78 | 12.01         | -0.615             | 0.475     |          |
| Family life          | 51.32  | 8.37          | -0.048             | -0.164    |          |
| Social life          | 46.23  | 10.49         | -0.028             | 0.145     |          |
| Hobbies              | 48.1   | 11.56         | 0.180              | 1.203     |          |

Asymmetry and Kurtosis values for all scales range from -1 to 1 (in some cases in the range from -2 to 2). It makes it possible to talk about that the characteristic distributions in question are closer to normal. This allows you to use parametric data processing methods.

Pearson’s correlation coefficient was used to identify correlation between the variables studied. Numerous direct correlations have been established between the indicators studied. Figure 1 shows it as a correlation graph. The level of hardiness (total score on «Hardiness Survey») correlated to 7 values. They are power (r=0.16; p=0.03), kindness (r=0.18; p=0.02), traditions (r=0.17; p=0.02), conformality (r=0.16; p=0.03), independence (r=0.2; p=0.01), achievements (r=0.31; p=0.001), spiritual satisfaction (r=0.2; p=0.01).

![Figure 1. Correlation between hardiness indicators and values of residents of northern Russia](image-url)
The belief that own activity allows to influence the result of what is happening (scale «control») is related to the significance of the 5 values studied. They are power (r=0.22; р=0.001), kindness (r=0.18; p=0.02), traditions (r=0.17; p=0.03), independence (r=0.22; p=0.001) и achievements (r=0.31; p=0.001). The belief that immersion in what is happening gives the maximum chance to find something worthwhile and interesting for yourself (the scale of «commitmen») is related to the 5 values studied. They are tradition (r=0.21; р=0.01), conformality (r=0.25; р=0.001), safety (r=0.26; p=0.001), achievements (r=0.27; р=0.001), and spiritual satisfaction (r=0.21; р=0.007).

It should be noted that most correlations found indicate weak strength between variables (r < 0.3)[19]. Only the value of personal success (achievement) reveals the connection of medium strength (0.3 < r < 0.5) with the level of hardiness and level of control of study participants.

To determine the value of the inhabitants of northern Russia, multiple regression analysis was used to predict their level of hardiness. The results of multiple regression analysis showed that the significance of values could explain only a small proportion of the variation of the level of hardiness in the sample (Table 5).

| Independent variables and constant | Model 1 | Model 2 | Model 3 |
|-----------------------------------|---------|---------|---------|
| Constant                          | 71.401* | 66.15*  | 69.07*  |
| Achievements                      | 1.559*  | 1.41*   | 1.407*  |
| High financial position           | -0.479**| -0.806* | -0.66*  |
| Social life                       | 0.219   | 0.399** | 0.773*  |
| Own prestige                      | -0.101  | -0.33   | -0.908* |

The report for model

| R (correlation coefficient)       | 0.354   | 0.395   | 0.427   |
| R²                                | 0.125   | 0.156   | 0.182   |
| p                                 | 0.00001 | 0.000003| 0.000001|

* p≤0.01
** p≤0.05

In particular, 3 regression models were obtained which explain 12.5% to 18.2% of the variation of the hardness level in the test sample. According to the results of mathematical modeling, the level of hardness is determined by such values as achievements, high material position, social life, and own prestige. Further analysis showed that these values predict a greater percentage of variance (14.3% to 22.2%) of the «control» element of hardiness (Table 6).

The regression models reflecting the correlation between the level of «challenge» and the values of the study participants (Table 7). They explain 12.8% to 17.2% variance of risk acceptance level.

It turned out that the ability to view life as an acquisition of experience can in part be determined by the importance to man of achievements, his own well-being, spiritual satisfaction and orientation towards understanding, tolerance, protection of the well-being of all living beings.

Least of all, in the structure of hardness, values allow you to predict the level of commitment. They explain from 7% to 10.3% of the variance of a given variable in the test sample (Table 8).
Table 6. Results of multi-dimensional step-by-step regression analysis of the connection of values and the level of control of residents of the North of Russia

| Independent variables and constant | Model 1 | Model 2 | Model 3 |
|-----------------------------------|---------|---------|---------|
|                                   | (β-БЕТА) |         |         |
| Constant                          | 25.2*   | 22.72*  | 23.96*  |
| Achievements                      | 0.724*  | 0.656*  | 0.653*  |
| High financial position           | -0.267**| -0.42*  | -0.358* |
| Social life                       | 0.231   | 0.188** | 0.347*  |
| Own prestige                      | -0.085  | -0.316  | -0.387* |

The report for model

- R (correlation coefficient) 0.379 0.419 0.471
- R² 0.143 0.176 0.222
- p 0.0000025 0.0000005 0.0000001

* p≤0.01
** p≤0.05

Table 7. Results of multi-dimensional step-by-step regression analysis of the correlation between values and the level of challenge of residents of the North of Russia

| Independent variables and constant | Model 1 | Model 2 | Model 3 |
|-----------------------------------|---------|---------|---------|
|                                   | (β-БЕТА) |         |         |
| Constant                          | 10.4*   | 11.01*  | 11.5*   |
| Achievements                      | 0.234*  | 0.3*    | 0.235** |
| Own prestige                      | 0.243*  | -0.246* | -0.248* |
| Spiritual satisfaction            | 0.235*  | 0.289*  | 0.256*  |
| Universalism                      | -0.177  | -0.097**| -0.116**|
| Stimulation                       | 0.136   | 0.178   | 0.218** |

The report for model

- R (correlation coefficient) 0.357 0.388 0.415
- R² 0.128 0.15 0.172
- p 0.00005 0.00002 0.00009

* p≤0.01
** p≤0.05

Table 8. Results of multi-dimensional step-by-step regression analysis of the correlation between values and the level of commitment of residents of the North of Russia

| Independent variables and constant | Model 1 | Model 2 |
|-----------------------------------|---------|---------|
|                                   | (β-БЕТА) |         |
| Constant                          | 29.441* | 23.96*  |
| Achievements                      | 0.477*  | 0.368*  |
| Safety                            | 0.19    | 0.284** |

The report for model

- R (correlation coefficient) 0.265 0.321
- R² 0.07 0.103
- p 0.0005 0.0001

* p≤0.01
** p≤0.05
It should be noted, that the results of our study coincided with the results obtained by A.A. Klimov [15]. In particular, the authors found that the hardiness of students is related to the importance of values in the sphere of social life. This pattern is explained by the fact that according to S.R. Maddi, social support (social resource) is one of the ways to get the necessary support in difficult situations [12]. The relationship between hardiness and the value of the sphere of social life can be explained by the fact that this sphere is both a resource for obtaining support and a condition for acquiring the necessary experience of knowledge. This is well consistent with the data of S. R. Maddi, who believes that hardiness includes the value of «cooperation» [15].

In favor of the idea, S.R. Maddi says the fact that in the regression models we have obtained, individual values (material well-being and own prestige) have negative coefficients. But the values associated with the orientation towards society and other people (achievements, universalism) have positive coefficients.

4. Conclusion
The study found correlations between the values and hardiness of residents of northern Russia. And we managed to find a previously undefined pattern, indicating that individualistic values indicate a decrease in the level of hardiness, and the value of social life - its increase.

A significant limitation of this study is that there was no comparison sample. Such a sample would assess the extent to which the identified correlations characterize the hardiness of the inhabitants of northern Russia and the extent to which they are universal. Aware of this disadvantage, we plan to further compare the structure of correlations of hardiness and values of residents of northern Russia with the structure of correlations of hardiness and values of residents of southern Russia (Rostov-on-Don, Crimea) and residents of the Ural. This will allow us to draw an accurate conclusion about the regional specificity of the akmeological factor of resilience.

Acknowledgement
The work was carried out with the support of RFBR (Grant No. 18-013-00910).

References
[1] Yaprak P, Güçlü M and Durhan T A 2018 The happiness, hardiness, and humor styles of students with a bachelor’s degree in sport sciences Behav. Sci. (Basel) 8
[2] van der Meulen E, van der Velden P G, Setti I and van Veldhoven M J P M 2018 Predictive value of psychological resilience for mental health disturbances: A three-wave prospective study among police officers Psychiatry Res. 260 486-94
[3] Sarkar M 2017 Psychological Resilience: Definition Advancement and Research Developments in Elite Sport Corresponding author Declaration of conflicting interests Acknowledgments None declared Int. J. Stress Prev. Wellbeing 1
[4] Sivrikova N, Ptashko T, Perebeynos A, Moiseeva E, Vorozheykina A and Terehov A 2019 Hardiness and the Big Five personality traits among inhabitants of the Ural region (Atlantis Press)
[5] Leontiev D A and Rasskazova E I 2006 Psychodiagnostic series (Moscow: Meaning)
[6] Pugach, L Yu Almeshkin A 2018 Theoretical understanding of the concept of “hardiness” of personality in the works of foreign and domestic authors J. psychiatry Med. Psychol. 32-40
[7] Diener E, Lucas R E and Oishi S 2018 Advances and open questions in the science of subjective well-being Collabra Psychol. 4
[8] Schäferle W, Roth R, Lothaler H and Endler C 2018 Psychische Belastung, Nähe, Distanz und Kohärenzgefühl von Physiotherapeuten in der Einzelbehandlung physioscience 14 161-169
[9] Malkin V, Rogaleva L, Kim A and Khon N 2019 The hardiness of adolescents in various social groups Front. Psychol. 10 2427
[10] Callina K S, Burkhard B, Schaefer H S, Powers J, Murray E D, Kobylskii G, Ryan D M, Kelly D, Matthews M D and Lerner R M 2019 Character in context: Character structure among United
States Military Academy cadets

[11] Kowalski C M and Schermer J A 2019 Hardiness, Perseverative Cognition, Anxiety, and Health-Related Outcomes: A Case for and Against Psychological Hardiness Psychol. Rep. 122 2096-2118

[12] Maddi S R 2016 Hardiness as a pathway to resilience under stress 144-150

[13] Soleimani M A, Pahlevan Sharif S, Yaghoobzadeh A and Sim Ong F 2016 Relationship Between Hardiness and Addiction Potential in Medical Students Iran. J. Psychiatry Behav. Sci.

[14] Fokina I V, Sokolovskaya O K and Nosova N V 2019 Hardiness and its relationship to values in adolescence Probl. Mod. Pedagog. Educ. 468-471

[15] Klimov A A 2011 Hardiness and its relationship with the personal values of students Bull. Samara Humanit. Acad. Ser. Psychol. 2 14-23

[16] Statsenko T M 2015 Study of Hardiness in mature Achiev. Mod. Sci. 4 81-84

[17] Oschepkov A A and Friauf V V 2019 Features of the system of value orientations and structures of tenacious of life of personality of youth with high level of leadership abilities Alma mater. Vestn. Vyys. Shkoly 25-8

[18] Sivrikova N V, Postnikova M I, Soldatova E L, Ptashko T G, Chernikova E G and Shevchenko A A 2019 Comparative analysis of the hardiness of representatives of different generations of modern Russia Russian psychological journal 16 144-165

[19] Pfeiffer J 2012 E-Commerce interactive decision-making tools (London: Springer)