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## DYNAMICS OF INDICATORS OF ADAPTATION TO LIFE IN THE ANTARCTICA AMONG POLAR EXPLORERS OF DIFFERENT AGE GROUPS

*The scientific developments of domestic and foreign researchers dealing with the problem of adaptation to life in extreme conditions are analysed. The relevance of the article stems from the fact that Ukraine is one of the 29 countries in the world that has a permanent scientific station in Antarctica. Since 1995, Ukraine has had the opportunity to conduct longitudinal research under the State Targeted Scientific and Technical Research Program in Antarctica. The main issue of the direction of medical and physiological research, within which our scientific work takes place, is the psychological training of Ukrainian winterers who stay for a long time (12–13 months) at the Antarctic station. The concept of psychological adaptation to life in extreme conditions is specified; the types of accentuations of Ukrainian winterers are determined; methodological tools of psychological research are presented. The main accentuations that are characteristic of winterers of different age groups are highlighted, and the peculiarities of personality behaviour with different types of accentuations are outlined. The analysis of the research on the role of winterers' accentuation in the process of adaptation to extreme living conditions being conducted during 10 years has showed that the main types of accentuation in the winterers are as follows: hyperthymic, emotional, stuck and demonstrative. These accentuations of character mainly contribute to the successful psychological adaptation of winterers to life in Antarctica. The types of accentuations (conformity, dysthymia, anxiety, instability, schizoid orientation), which may interfere with psychological adaptation, has a small percentage of representation in the winterers, or are not represented at all. The results of the study have proved that the psychological adaptation of Ukrainian winterers to extreme conditions has a complex hierarchical structure and is formed on the basis of individual qualities and the influence of appropriate natural, interpersonal and professional conditions. Such results enable defining new criteria for psychophysiological and psychological monitoring and forecasting concerning personality adaptation to extreme living conditions.*

**Key words:** adaptation, groups of personalities by types of accentuations, extreme living conditions.

### Introduction

Our research is based on the holistic approach in science, according to which the human body is a part of Nature and is not separated from the environment. Thus human adaptation to living conditions is in the line with natural laws and processes, being closely interrelated with climatic, meteorological, biorhythmological and other factors (Barbarito, Baldanza, Peri, 2001; Khandelwal, Bhati, Mishra, 2015; Mehlhorn, Mehlhorn, 2017; Mocellin et al., 1991; Mullin, 1960; Nicolasn et al., 2016; Palinkas, 2001; Palinkas, 2003; Palinkas, Houseal, 2000; Palinkas, Suedfeld, 2008; Solanas et al., 2016; Steine et al., 2003; Suedfeld, 1991; Suedfeld, Weiss, 2000).

The phenomenon of adaptation can be understood as a process of multilevel adaptation, covering the characteristics of the human being as an organism (biological level), individual (psychophysiological level) and personality (psychological level).

Based on the work of A. Nalchadjian we believe that an adapted person is characterized by high professional productivity, well-being, emotional and mental balance (Налчаджян, 2010). Stemming from this prerequisite, we have studied the psychological adaptation of the winterers to extreme living conditions taking into consideration the manifestations of their character accentuation. The scientific literature highlights various aspects of the

problem of character accentuation and the role of this psychological phenomenon in individual's adaptation to different activities including such in extreme conditions (Налчаджян, 2010; Nan Chen et al., 2016; Mehta, Chugh, 2011; Nicolas et al., 2016; Tortello et al., 2018).

Studies of individual's psychological characteristics occupy key positions in the system of researching into person's behaviour in extreme activities, and form the basis for predicting professionals' fitness and adaptation to conditions of social isolation and permanent influence of environmental factors.

However, some issues concerning this field of research remain understudied. These can be grouped into following problems:

- 1) there is no systematic study of the problem of winterers' adaptation concerning the manifestation of accentuations in different age groups;
- 2) the components of psychological adaptation to the activities in extreme conditions are not clearly defined.

The aim and tasks

During preparation for a long-term expedition to Antarctica, psychological research has been conducted with the winterers being engaged in the activities at the Ukrainian station "Academician Vernadsky" in Antarctic. For ten years, starting with the XVI Ukrainian Antarctic Expedition to the station "Academician Vernadsky"

(2011–2012), we have been conducting research relating to psychological adaptation of winterers for the research activities in Antarctica (Miroshnychenko et al., 2020).

The aim of the article is to present the theoretical foundations and practical results of the study of the role of accentuations in the psychological adaptation of Ukrainian winterers to life in extreme conditions during 10 expeditions to the Ukrainian Antarctic Station “Academician Vernadsky”.

The tasks of the article are as follows: 1) to deepen the concept of psychological adaptation to life in extreme conditions; 2) theoretically substantiate the definition of character accentuation, outline their features in winterers; 3) to present the methodological tools of psychological research; 4) to demonstrate the results of the study of the peculiarities of polar researchers’ accentuations in different age groups; 5) to outline the role of polar researchers’ accentuations in adaptation process to extreme living conditions.

#### Materials and methods

The empirical study was conducted in the period from 2011 to 2020. The study involved winterers who performed professional duties at the Ukrainian Antarctic Station “Academician Vernadsky” for 12–13 consecutive months. The total number of respondents was 71 people (including 69 men and 2 women), the age of respondents was from 23 to 63.

The same research has been conducted during 2018–2020 among the representative of other professions; the total number of people was 767 people, including 327 men, 440 women (age 21–56).

To determine the role of character accentuations in psychological adaptation to extreme living conditions, we have relied on the theoretical basis presented in the works of domestic and foreign scientists: B. Hannushkin, E. Burno, K. Leonhard, V. Ponomarenko, A. Yegides, H. Schmieschek, J. Oldham, L. Morris and others (Леонгард, 1981; Oldham, Morris, 1995; Schmieschek, 1970).

The organization of research is consistent with the program of technical and psychological tasks of the National Antarctic Research Centre of Ukraine. Some research data are presented in our publications (Мірошніченко, Гуцуляк, Марченко, 2017; Miroshnychenko et al., 2020).

To determine the features of character accentuation in winterers and their role in the process of adaptation to life in extreme conditions, we have used different groups of methods: organizational, empirical, data processing and interpretive methods. Among the empirical methods, the observations and self-observations have been used; this article presents the results of using methods for studying character accentuations by K. Leonhard, H. Schmieschek, J. Oldham and L. Morris (Леонгард, 1981; Schmieschek, 1970; Oldham, Morris, 1995); “Characterological accentuation of personality and neuropsychological instability” by D. Shpachenko; “MMPI Questionnaire (abbreviated version of the Minnesota Multidimensional Personality Questionnaire)” adapted by F. Berezin and M. Miroshnikov; the method “Forecast” of the St. Petersburg Military Medical Academy.

Among the group of data processing methods, the quantitative (mathematical statistics; comparison of average values using parametric and nonparametric methods) and qualitative (differentiation of material by types of investigated persons) methods have been used. Among the group of interpretation methods, we have used the structural and qualitative interpretation of the peculiarities of the obtained results.

Since all methods are reduced to a single scale for measuring indicators (from 0 – complete absence of manifestation of studied quality, to 24 – the maximum manifestation), then the accentuation of character can be considered as pronounced (according to K. Leonhard and H. Schmieschek) within 18–24 points.

The obtained results of the methods were confirmed by the use of an auxiliary method – the interviews with the winterers. The application of these methods has ensured the reliability and validity of our study.

#### Results and discussion

Accentuated characters depend on both natural and biological properties and environmental factors that affect the way of human life and are reflected in individual typological features. Character accentuations are extreme variants of the norm, in which certain character traits are excessively strengthened, as a result of which the selective vulnerability to a certain kind of psychogenic actions is revealed while there is good and even increased resistance to others psychogenic influences.

Analysis of theoretical material shows that the character of the personality may have different degrees of manifestation of individual-typological features. Graphically, the boundary between norm and pathology can be identified on the axis, which shows the intensity of the manifestations of the characters.

It is marked by three zones: the zone of absolutely normal characters, the zone of pronounced characters (accentuations) and the zone of strong deviations of characters (psychopathy). The first and second zones belong to the norm (in a broad sense), the third – to the pathology of character. Accordingly, the character accentuations are considered as extreme variants of the norm.

Taking into consideration the pronounced manifestations of character traits, we can conclude that K. Leonhard’s term “accented personality” (Леонгард, 1981) has gained the greatest popularity. In his opinion, accentuated personalities are healthy individuals with their own individual characteristics.

Due to analysing the theoretical foundations of differentiating the types of accentuations in different authors (Dotlich, Cairo, 2003; Furnham, Trickey, Hyde, 2012; Furnham, Milner, Akhtar, 2014; Hogan, Hogan, 2009; Леонгард, 1981; Miller, 2008; Oldham, Morris, 1995; Schmieschek, 1970), we have created a comparative table presenting our vision of the classification of individual-typological features of personality (see table 1).

The factors that initiate the development of professional deformities in specialists are connected with different accentuations of their personalities. In the process of person’s long-term performance of the same activity, accentuations are professionalized, being woven into the fabric of individual style of activity and transformed into specialists’ professional deformations. So, professional accentuations are an excessive strengthening of some character traits, as well as certain professionally conditioned personality traits and qualities that can interfere with professional adaptation.

To check how the accentuated character traits are manifested in the processes of adaptation of Ukrainian winterers to the living conditions in Antarctica, we have conducted a longitudinal research using the above mentioned methods, comparing the winterers’ types of

Table 1

Comparative table of different classifications of types of accentuations

K. Leonhard	P. Hannushkin	E. Lichko	A. Yegides	V. Ponomarenko	J. Oldham & L. Morris	
					style	disorder
Stuck	Paranoid	–	Paranoid	Paranoid	Vigilant	Paranoid
Pedantic	Psychasthenic	Psychasthenic	Psychasthenoid	–	Conscientious	Obsessive-Compulsive
Demonstrative	Hysteric	Hysteroid	Hysterical	Hysterical	Dramatic	Histrionic
Excitable	Epiletoid	Epileptoid	Epiletoid	Epiletoid	Adventurous	Antisocial
Hyperthymic	Constitutionally excited	Hyperthymic	Hyperthymic	Hyperthymic	Self-Confident	Narcissistic
Dysthymic	Constructive-depressive	–	–	Hyperthymic	Serious	Depressive
Cycloid	Cyclothymic	Cycloid	Cycloid	–	Aggressive	Sadistic
Emotive	–	Sensitive	Sensitive	Emotional	Sensitive	Avoidant
Exalted	Emotionally labile	Emotionally labile	–	–	Mercurial	Borderline
Anxious	Asthenic	Astheno-neurotic	Asthenic	Anxious	Self-Sacrificing	Self-Defeating
Extroverted	Unstable	Unstable	Unstable	–	Leisurely	Passive-Aggressive
Introverted	Schizophrenic	Schizoid	Schizophrenic	Schizophrenic	Solitary	Schizoid
–	Neurasthenic (hypochondriac)	–	–	–	Ideosyncratic	Schizotypal
–	Unreasonable	Conformal	Conformny	–	Devoted	Dependent

Source: developed by the authors

accentuation with their temperaments. The obtained data are summarized in table 2. The names of the scales basically coincide with the names presented in the Leonhard-Schmischek method.

The table shows the presence of accentuated character traits in Ukrainian winterers. As you can see, the largest percentage has a hyperthymic accentuation, which indicates the presence of optimism, high spirits, a sense of adventurism, propensity for risky actions, sincerity, openness, restlessness. More than half of the studied winterers (56,3%) have the traits that, to some extent, help them cope with the difficulties of adaptation to extreme living conditions. This conclusion is correlated with the research of M. Mehta and G. Chugh (Mehta, Chugh, 2011).

Table 2

Generalized classification of types of accentuations in winterers (71 persons)

The type of accentuation	Temperaments most often manifested	Percentage of people with accentuations
Hyperthymic	Sanguine	40 (56,3%)
Dysthymic	Phlegmatic	4 (5,6%)
Labile	Choleric	11 (15,4%)
Anxious	Phlegmatic	6 (8,5%)
Emotional	Melancholic	25 (35,2%)
Pedantic	Phlegmatic	11 (15,4%)
Closed		absent
Stuck	Choleric	18 (25,3%)
Excitable	Choleric	10 (14,1%)
Demonstrative	Choleric	18 (25,3%)
Unstable	Sanguine	6 (8,5%)
Conformal	Sanguine	5 (7,0%)

Source: developed by the authors

Then, the emotional accentuation plays a very important role in adaptation process since more than a third (35,2%) of the studied winterers possesses it. This indicates that such winterers have empathy and team spirit while cooperating with their colleagues. In our opinion, without displaying empathy for partners, it is impossible for a winterer to feel like a member of a closed group. Therefore, we consider such traits one of the most necessary ones for winterers being adapted to life in the extreme conditions of Antarctica.

More than a quarter of the subjects (25,3% each) are characterized by stuck and demonstrative types of accentuation. Stuck accentuation is characterized by increased persistence, perseverance, determination, desire to complete the work, overcoming obstacles, the aspiration to succeed despite the difficulties. In our opinion, such manifestations of the stuck accentuation testify to winterers' good adaptation to work and life in extreme conditions of Antarctica.

More than a quarter of the winterers (25,3%) have indicators of demonstrative accentuation revealing the features of artistry; such persons like to be in the spotlight, they are informal leaders during leisure time on long winter evenings. It is known that the Ukrainian Antarctic station preserves the tradition of the British winterers, who organize "gentlemen's parties" on Saturdays. Such parties promote the cohesion of small groups, meet the need for communication, exchanging ideas and expressing feelings. It is at such informal meetings that the team has the opportunity to congratulate those having their birthdays. Therefore, the role of people with demonstrative accentuation is indispensable in raising the "fighting spirit" of the team and is also an indicator of psychological adaptation to life in Antarctica.

The types of accentuations turned out to be the least typical in winterers are conformal (in 5 persons), unstable (in 6 persons), anxious (in 6 persons). Schizoid accentuation (closed type) was not found in any person.

Table 3

*Relationships of types of accentuation with the types of temperament in winterers*

Accentuation type	Temperament type							
	Choleric (6 people)		Sanguine (38 people)		Phlegmatic (25 people)		Melancholic (2 people)	
	Number of accentuations	%						
Hyperthymic	4	66,7	26	68,4	10	40,0	-	-
Dysthymic	-	-	-	-	3	12,0	1	50,0
Labile	4	66,7	5	13,2	1	4,0	1	50,0
Anxious	-	-	3	7,9	3	12,0	-	-
Emotional	3	50,0	10	26,3	10	40,0	2	100,0
Pedantic	1	16,7	4	10,5	6	24,0	-	-
Closed	-	-	-	-	-	-	-	-
Stuck	3	50,0	10	26,3	4	16,0	-	-
Excitable	4	66,7	4	10,5	2	8,0	1	50,0
Demonstrative	2	33,3	8	21,1	8	32,0	-	-
Unstable	2	33,3	3	7,9	1	4,0	-	-
Conformal	1	16,7	3	7,9	1	4,0	-	-
General number of accentuations	24		76		50		5	
Average number of accentuations	6,0		2,0		2,0		2,5	

Source: developed by the authors

Obviously, these types of accentuation are not typical for people who are good at making decisions and are ready for a long expedition to Antarctica.

The following table shows the relationship between the types of accentuation with the types of temperament in studied winterers (see table 3).

As we can see, choleric are most represented by such types of accentuations as hyperthymic, labile and excitable; the sanguine persons cover 68,4% of winterers characterized by hyperthymic accentuation (the highest rate in the entire sample); for phlegmatics the hyperthymic and emotional accentuations are characteristic; for melancholics the emotional accentuation is typical.

To compare the data obtained among the winterers with the indicators of character accentuations in representatives of other professions, we have conducted a study, using the same methods, among teachers of secondary schools in Zhytomyr, employees of the International Anti-Drug Association, Master students at Zhytomyr Ivan Franko State University. The study has been conducted during 2018–2020; the total number of people was 767 people, including 327 men, 440 women (age 21–56).

A generalized classification of accentuation types in this sample is presented in table 4.

As can be seen, the most manifested here are the following 6 types of accentuations: hyperthymic, labile, emotional, pedantic, stuck and demonstrative. The least represented types are closed, unstable and conformal.

The relationship of the types of accentuations with the type of temperament in this sample is presented in table 5.

After analysing the obtained data, we can conclude that the presence of accentuations being features of persons' character differs in two samples: in representatives of other professions, according to our sample, accentuations are distributed as follows:

– in choleric the most pronounced is hyperthymic type of accentuation;

Table 4

*Generalized classification of types of accentuations in representatives of different professions*

The type of accentuation	Temperaments most often manifested	Percentage of people with accentuations
Hyperthymic	Sanguine	51,9
Dysthymic	Phlegmatic	12,7
Labile	Choleric	44,1
Anxious	Melancholic	19,9
Emotional	Melancholic	47,5
Pedantic	Melancholic	31,8
Closed	Phlegmatic	8,1
Stuck	Choleric	20,1
Excitable	Choleric	29,9
Demonstrative	Choleric	37,5
Unstable	Phlegmatic	3,3
Conformal	Choleric	4,4

Source: developed by the authors

- in sanguine – hyperthymic type;
- in phlegmatics – pedantic type;
- in melancholics – anxious type.

While in the winterers we have the following picture:

- in choleric the most pronounced are hyperthymic, labile and excitable types of accentuation;
- in sanguine – hyperthymic type;
- in phlegmatics – hyperthymic and emotional types;
- in melancholics – emotional type.

This difference in the representation of the types of accentuations between the winterers and the representatives of other profession may indicate certain peculiarities in the structure of winterers' character, which contribute to adaptation to extreme living conditions.

We also found out that adaptation to extreme living conditions depends to some extent on the age

of the winterers. In order to clear up this regularity, all participants in our Antarctic experiment were divided into three age groups: senior (46–63 years), middle (35–45 years), junior (22–34 years). The grounding for such a division is presented in our previous articles (Мірошніченко, Гуцляк, Марченко, 2017; Miroschnychenko et al., 2020).

The first and second cross-sections correspond to the first and the second measurements with a difference of three months. We determined this period based on the fact that manifestations of occupational fatigue in extreme living conditions appear in some winterers as a result of insufficient adaptation during 3–4 months after the start of the expedition, since during this period is there the Antarctic winter with almost no light time. This period is also characterized by winterers' longing for home.

We can put forward an assumption that adaptation to extreme living conditions (leading to possible changes in psychological indicators of personality) also depends on the age of winterers. In table 6 are there the average scores of adaptation in senior group of subjects (12 people).

As you can see, all indicators of accentuation phenomena do not exceed the average, but the percentage in negative emotional manifestations in this group has increased from 2,4% to 22,4%.

Although the characteristics of this age group include positive emotional traits such as optimism, high performance, interest in personal growth and, at the same time, collectivism and team spirit, we found an increase of stuck on unresolved issues, as well as some increase in anxiety, pedantry, irritability and dysthymia (depression) after three months of the expedition under condition of Antarctic night.

Table 7 presents the average scores of adaptation indicators in the middle age group of winterers, consisting of 31 persons aged 35 to 45 years. It is the first largest group of studied winterers.

Representatives of this age are considered to be ready for changes, making a choice, independence, informal views, and search for emotions, pragmatism, and high level of material ambition.

As we can see, in the middle age group of winterers the average scores on only two indicators (stuck and pedantry) have increased slightly, the rest indicators are characterized by negative values.

This indicates that the negative emotional manifestations of character had not increased under the influence of extreme conditions, but even decreased. Such data indicate the neuropsychological and emotional resilience of middle-aged winterers participating in Antarctic expeditions.

Table 8 presents the average scores of adaptation indicators in the younger age group of winterers. It is the second largest group of studied winterers consisting of 28 people aged 22 to 34 years.

As we can see, the averages for all scales have some increase, although their quantitative data on the scales "dysthymia" and "excitability" differ favourably comparing with the previous groups since they have the lowest scores among all age groups. It shows the optimism of youth generation, their energy, placability. This generation is characterized by a sense of civic duty, morality, responsibility, following modern fashion, and a desire to rebuild society.

### Conclusions

The analysis of scientific literature and the data of our research enable concluding that adaptation involves complex, multifaceted human relationships with the environment. In the context of human biological adaptation, in case of high dependence of the individual on the environment, the adaptation processes more accurately reflect the essence of adaptation as a biological adjustment of organism to its environment.

Concerning the psychological adaptation, the concept of "interaction" is often used. It presupposes some equality

Table 5

*Relationships of types of accentuations with the type of temperament in representatives of different professions*

Accentuation type	Temperament type							
	Cholerics (244 people)		Sanguine (281 people)		Phlegmatic (122 people)		Melancholics (120 people)	
	Number of accentuations	%	Number of accentuations	%	Number of accentuations	%	Number of accentuations	%
Hyperthymic	146	59,8	190	67,7	42	34,4	20	16,7
Dysthymic	34	13,9	19	6,8	23	18,9	22	18,3
Labile	118	48,4	113	40,2	49	40,2	58	48,3
Anxious	39	16,1	14	5,1	24	19,7	76	63,3
Emotional	119	48,8	123	43,8	49	40,2	73	60,8
Pedantic	77	31,6	57	20,3	54	44,3	56	46,7
Closed	17	7,0	12	4,3	17	14,0	16	13,3
Stuck	69	28,3	27	9,6	26	21,3	32	26,7
Excitable	101	41,4	69	24,6	24	19,7	35	29,2
Demonstrative	118	48,4	114	40,6	23	18,9	33	27,5
Unstable	8	3,2	7	2,5	6	4,9	4	3,3
Conformal	19	7,8	5	1,8	4	3,3	6	5,0
General number of accentuations	944		805		378		484	
Average number of accentuations	3,9		2,9		3,1		4,1	

Source: developed by the authors

of subjects and objects, their interrelation and reciprocal influence. The process of psychological adaptation, as an interaction, is closely related to the recognition of active role of the individual in the process of adaptation. Thus, O. Sannikov, having studied the operators of information systems that work in extreme conditions, also determines the leading role of personality in the decision-making system in complex situations (Sannikov, 2016). This has been confirmed by our data.

Peculiarities of adaptation to professional activity in extreme conditions are studied by L. Perilygina and E. Mykhlyuk (Perilygina, Mykhlyuk, 2017). The authors study the manifestations of accentuations in the process of adaptation to professional activities in the employees of the Ministry of Emergencies of Ukraine. The data presented in the work indicate a more pronounced level of character accentuations and some professional deformation in the employees than in the winterers. Thus, E. Mykhlyuk notes that such accentuated character traits as pedantry, anxiety and schizoid orientation being manifested in firefighters may lead to an increased risk of injury and accidents.

Similar data are presented in the works of O. Bashkina, who has proved that such types of accentuations as labile, anxious and unstable are observed in persons with high rates of violations of official discipline in police activities. As you can see, in the data of our study, these types of accentuations are almost not detected. By large, the analysis of the research on the role of winterers' accentuation in the process of adaptation to extreme living conditions being conducted during 10 years has showed that the main types of accentuation in the winterers are as follows (in

descending order): hyperthymic, emotional, stuck and demonstrative. We believe that these accentuations of character mainly contribute to the successful psychological adaptation of winterers to life in Antarctica. The types of accentuations (conformity, dysthymia, anxiety, instability, schizoid orientation), which, in our opinion, may interfere with psychological adaptation, has a small percentage of representation in the winterers, or are not represented at all.

The results of the study have proved that the psychological adaptation of Ukrainian winterers to extreme conditions has a complex hierarchical structure and is formed on the basis of individual qualities and the influence of appropriate natural, interpersonal and professional conditions. At the same time, winterers' personality characteristics are closely related to the state of their psychophysiological functions, including accentuations of character. We believe that along with the general regularities of adaptation, the adaptive behaviour of the winterers indicates a high level of readiness for life in extreme conditions. Such persons, making up the majority of winterers at the Ukrainian Antarctic Station "Academician Vernadsky", reveal rich adaptation resources and conscientiously perform their professional duties in the extreme conditions of Antarctica.

Along with the general patterns of adaptation, manifested at the neurodynamic, psychological and social levels, we take into account the fact that the adaptive behaviour of individuals in extreme conditions is characterized by decision-making, the right to initiative and accurate determination of their future. Such persons mostly have a normal non-defensive form of adaptation;

Table 6

*Dynamics of accentuation indicators in the older age group of winterers (number of people is 12)*

Scores of adaptation	Stuck		Pedantic		Anxious		Dysthymic		Excitable	
	Cross-section I	Cross-section II								
Average scores	9,57	11,71	9,14	9,64	9,29	9,57	9,57	10,36	9,21	9,43
Difference	2,14 (22,4%)		0,5 (5,5%)		0,28 (3,0%)		0,79 (8,3%)		0,22 (2,4%)	

Source: developed by the authors

Table 7

*Dynamics of adaptation indicators in the middle age group of winterers (number of people is 31)*

Scores of adaptation	Stuck		Pedantic		Anxious		Dysthymic		Excitable	
	Cross-section I	Cross-section II								
Average scores	10,20	10,04	8,28	8,76	4,88	4,76	9,28	8,68	9,08	7,92
Difference	0,16 (0,6%)		0,48 (1,9%)		-0,12 (0,5%)		-0,6 (2,4%)		-1,16 (4,6%)	

Source: developed by the authors

Table 8

*Dynamics of adaptation indicators in the younger age group of winterers (number of people is 28)*

Scores of adaptation	Stuck		Pedantic		Anxious		Dysthymic		Excitable	
	Cross-section I	Cross-section II								
Average scores	10,42	10,48	8,77	9,45	6,58	6,65	8,68	8,94	7,77	7,93
Difference	0,06 (0,6%)		0,68 (7,8%)		0,07 (1,1%)		0,26 (3,0%)		0,16 (2,1%)	

Source: developed by the authors

they do not avoid problematic situations, but use these to achieve their goals. Such persons, making up the majority of winterers at the Ukrainian Antarctic Station, plan and realize their future and overcome difficulties.

The data of our research correspond to a conclusion that an important role in adapting to extreme conditions is played by such social personality traits as enthusiasm, responsibility, optimistic orientation to the future, determination and the need for self-realization (Mehta, Chugh, 2011).

Taking into account the identified indicators, we draw conclusions about the readiness of candidates for participants of winter expeditions to live in Antarctica. Preference is given to the candidates who have indicators of strong, balanced nervous system, as well as professional-productive and social motivation for activity, high rates of adaptation to extreme and stressful conditions and the absence of high rates of character accentuations.

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It is proved that the most adapted age group in terms of life in Antarctica are middle-aged people aged 35 to 45 years. Representatives of this group make up about 40% of the participants of the Ukrainian Antarctic expeditions, which indicates a sufficient level of psychological stability in wintering teams.

L. Bakhmutova, who has studied interpersonal relationships among Ukrainian participants in Antarctic expeditions, proved that psychological adaptation to life in Antarctica is associated with the peculiarities of establishing social ties between members of long-term expeditions: the higher the social status of the winterer, the better processes of his/her psychological adaptation (Bakhmutova, 2019). Our research confirms this regularity (Мірошніченко, Гуцуляк, Марченко, 2017). This conclusion reveals new vistas concerning a perspective research into the problem of relationship between persons' social status and their adaptation resources in extreme living conditions.

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## ДИНАМІКА ПОКАЗНИКІВ АДАПТАЦІЇ ДО ЖИТТЄДІЯЛЬНОСТІ В УМОВАХ АНТАРКТИКИ В ЗИМІВНИКІВ РІЗНИХ ВІКОВИХ ГРУП

У роботі проаналізовано наукові розробки вітчизняних і зарубіжних дослідників, які займаються проблемою адаптації до життя в екстремальних умовах. Актуальність статті зумовлена тим, що Україна є однією з 29 країн світу, яка має постійну наукову станцію в Антарктиді. З 1995 р. Україна має можливість проводити довготривалі дослідження за Державною цільовою програмою науково-технічних досліджень в Антарктиці. Основним питанням напряму медико-фізіологічних досліджень, у межах якого здійснюється наша наукова робота, є психологічна підготовка українських зимівників, які тривалий час (12–13 місяців) перебувають на антарктичній станції. У статті уточнено поняття психологічної адаптації до життя в екстремальних умовах, визначено типи акцентуацій українських зимівників, представлено методологічний інструментарій психологічного дослідження. Виділено основні акцентуації, характерні для зимівників різних вікових груп, окреслено особливості поведінки особистості з різними типами акцентуацій. Аналіз досліджень ролі акцентуації зимівників у процесі адаптації до екстремальних умов життя, які проводилися протягом 10 років, показав, що основними видами акцентуації зимівників є гіпертична, емоційна, застрягла та демонстративна. Ці акцентуації характеру здебільшого сприяють успішній психологічній адаптації зимівників до життя в Антарктиді. Типи акцентуацій, які можуть заважати психологічній адаптації (конформність, дистимія, тривожність, нестійкість, шизоїдна спрямованість), у зимівників представлені невеликим відсотком або не представлені зовсім. Результати дослідження довели, що психологічна адаптація українських зимівників до екстремальних умов має складну ієрархічну структуру та формується на основі індивідуальних якостей і впливу відповідних природних, міжособистісних та професійних умов. Такі результати дають можливість визначити нові критерії психофізіологічного та психологічного моніторингу і прогнозування адаптації особистості до екстремальних умов життя.

**Ключові слова:** адаптація, групи особистостей за типами акцентуацій, екстремальні умови проживання.