Korneeva Y., Simonova N.

THE CHOICE OF OPTIMAL ADAPTATION STRATEGY AS A FACTOR OF PSYCHOLOGICAL READINESS FOR SHIFT WORK IN THE FAR NORTH AND THE ARCTIC

Russia
Northern (Arctic) Federal University named after M.V. Lomonosov
Scientific and research institute of Arctic Medicine, Northern State Medical University, Arkhangelsk

Korneeva Yana, PhD in psychology, Associate professor of psychology department, head of department
Simonova Natalia, Dr in psychology, Professor, head of the psychology department, head of department

Abstract

The article is devoted to the optimal adaptation strategies for shift workers of oil and gas, diamond and forestry industries in the Far North and the Arctic in the context of psychological readiness for activity. The study involved 297 shift workers in three production areas aged from 21 to 63 years (average age 38,9 ± 0,61).

Research methods: documentary analysis, questionnaires, surveys and psychological testing, descriptive statistics and multivariate analysis of variance. The statistics is processed by SPSS 22.00. For the optimal type of adaptation strategy for shift workers in forestry, oil and gas production we defined an economical differentiated type predominantly expressed in the same regulatory processes of both when entering the profession in a variety of situations so as in a conscious allocating of internal resources within the shift period. The emergency differentiated type of adaptation strategy is optimal for shift workers in a diamond mining production. This type is characterized by the use of various regulatory processes depending on professional situations and wasteful spending of inner

resources during the shift. The adaptation strategies can be referred to the volitional characteristics of psychological readiness for shift work in the Far North and the Arctic.

Keywords: adaptation strategy, shift work, psychological readiness for work, the Arctic, training, self-regulation.

Introduction. Extreme climatic conditions of the Arctic, a remoteness from the main industrial centers are characteristic for the shift working method.[1]. Despite great efforts to reduce the influence of negative factors a professional activity in the Arctic remains one of the most extreme ones. The researchers' attention is not only focused on ensuring the necessary conditions, but also on studying an adaptation of human resources [4, 5].

Activities in extreme conditions make different requirements for the professional adaptation of workers owing to an unpredictable occurrence of stressful or emergency situations needed to be rapidly reacted and solved. Therefore in such circumstances adaptation looks like an unfinished process and results in the strategies ultimately formed.

We define adaptation strategies as an integral management by a worker of his ergatic system aimed to maintain the required level of working activity and his functional state performing professional duties in different conditions while sustaining physical and mental health within a long period of time [3].

The search for the optimal type of adaptation strategy and its purposeful formation allows to work effectively by maintaining human health and prolonging a professional lifetime. It can be possible by formation of psychological readiness for work while preparing psychologically for the professional activity and self-regulating activity.

According to Prof.Klimov E. the psychological readiness for complex activities makes an integral, dynamic process including a number of personal characteristics with the basic ones as follows:

1) motivation – a need to perform the task successfully, an interest in activities, a desire to succeed and show one's best side;

2) cognitive - understanding of responsibilities, working tasks, evaluating the importance to achieve the final results (in terms of prestige and status position), the idea of possible situative changes, etc.;

3) emotional - a sense of professional and social responsibility, confidence in success, enthusiasm;

4) volitional- a self-management and mobilization, focusing on the problem, a distraction from the disturbing influences, overcoming doubts, fears [2].

Thus there are certain contradictions between the need to form a psychological readiness for shift work at the stage of vocational studying prior to a professional work starting in the extreme conditions of the Far North and the Arctic and a lack of scientific research system and of a qualified specialists training.

Research objective. To define the optimal type of adaptation strategy for shift workers in the Far North and the Arctic as a factor of psychological readiness for professional work and to develop a technology of its formation.

Research methods. To achieve this goal we made a study in three basic industries with a shift work in the Far North and the Arctic:

1. The oil production manufacturing. 129 participants (the Kolguev island, 52 days shift) and 59 participants ("Toboy", "Tedinka", "Urengoy" drilling sites in Nenetz Ares with 28 days shift).

2. The diamond mining. 63 participants (Svetly settlement, Arkhangelsk region, 15 days shift).

3. Forestry production. 45 participants (the Ustyansky area, Arkhangelsk region, 14 days shift).

The study involved 297 people aged 21 to 63 years (the average age 38.9 + 0.61).

Research methods: documentary analysis, questionnaires, surveys and psychological testing by using the following techniques: diagnosis methods of social and psychological adaptation (K.Rogers, R. Diamond adapted by A. Osnitsky, 1954); a questionnaire "Self-regulation of behavior" (V. Morosanova, 1988); a test on color preferences (M. Lüscher adapted by L. Sobchik, 1949); a questionnaire for the subjective control level (J. Rotter adaptated by E.Bazhina, 1984); a diagnosing technique for personality motivating structure (V. Milman, 1990). Statistical methods: descriptive statistics and multivariate analysis of variance by SPSS 22.00.

Results and discussion. N. Simonova developed a typology of adaptive strategies. The study found that the choice of adaptive strategy is influenced by such factors as the shift duration and the self-regulation level(Fig. 1).

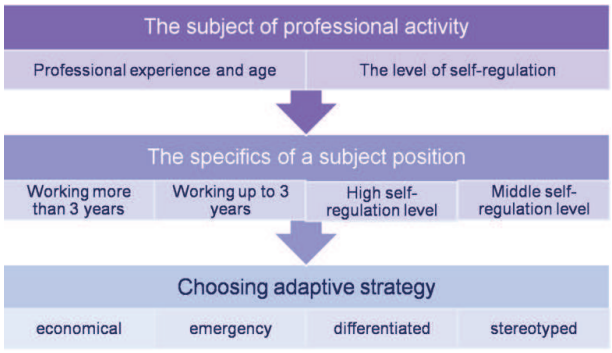

Fig. 1 The choice of the adaptive strategy as a result of the subject position

Depending on the experience period specialists are divided into those working up to 3 years - "adaptants" and over 3 years - "stazhists". This boundary is drawn empirically - most of dismissals come on the first 3 years of work. It is characteristic for "the adaptants" to choose an emergency adaptive strategy: when starting the work they waste their strength and internal reserves intensively, the periods of relaxation get longer, they need much time and inner resources to get over this state. However, with the original level of internal reserves being higher they work effectively. (Table 1).

For "the stazhists" it is characteristic to choose an economical adaptive strategy, ie they gradually expend their resources during their shifts, need shorter breaks for a rest. They work effectively by allocating their resources correctly during a shift.

All shift workers possess either an average or a high level of self-regulation. Specialists with a low self-regulation level meet difficulties in a shift work, they are unable to adapt themselves to a mode of work and leave the work 2 or 3 shifts after. According to our data the most optimal shift for the professionals makes the average level of self-regulation as the high level of self-regulation in the Far North raises an anxiety among workers, a state of overcontrol, multiple not interacting, scattered self-regulation mechanisms start working. We call such adaptive strategy as a differentiated type. For workers with an average level of self-regulation it is typical to use a stereotyped adaptive strategy which comprises the use of mostly the same regulatory processes developed during the period of entry into the profession in a variety of situations (Table 1).

Table 1. The choice of adaptive strategy based on the experience and the self-regulation level (N. Simonova, 2011)

	Worker with experience more than 3 years	Worker with experience to 3 years
high level of self-regulation	Economical differentiated	Emergency differentiated
average level of self-regulation	Economical optimal	Emergency stereotyped

The choice of a particular adaptation strategy for shift workers is reasoned by the specifics of labour organization and industrial conditions, also by individual psychological characteristics of specialists.

To determine the best type of adaptation strategy for shift workers depending on the type of production we made a multivariate analysis of variance with an independent variable for the worker belonging to an enterprise sector (forestry, diamond mining, oil and gas), while for dependent variables we took interpretive coefficients of A Aminev in accordance with M. Lusher tests (this technique characteristics lie in the basis of adaptation strategies defining).

Multivariate tests (Table 2) show statistically significant differences, indicating the type of production effecting the physiological qualities of shift workers ($p = 0.0001$). The results of evaluating the effects of intergroup factors (Table 3) indicate that the variable "type of production" ($p < 0.05$) effects the following parameters (Table 3): heteronomous / autonomous, concentric / eccentric imbalance / balance of personal qualities, vegetative balance and mental performance.

Table 2. Multivariate criteria

Effect	Values	F	Hypothesis df	Error df	Sig.
След Пиллая	0,451	3,887	12,000	160,000	0,000
Лямбда Уилкса	0,584	4,057	12,000	158,000	0,000
След Хотеллинга	0,650	4,224	12,000	156,000	0,000
Наибольший корень Роя	0,535	7,138	6,000	80,000	0,000

Table 3. Evaluation of the effects of intergroup factors

Dependent variable	Type III Sum of squares	df.	Mean square	F	Sig.	Squared R^2
Heteronomous / autonomous	76,775[a]	2	38,388	3,519	0,034	0,055
Concentricity / eccentricity	308,935[b]	2	154,467	10,185	0,000	0,176
Imbalance / balance of personal qualities	170,558[c]	2	85,279	6,450	0,002	0,112
Vegetative balance	314,154[d]	2	157,077	10,086	0,000	0,174
Efficiency	47,474[e]	2	23,737	3,576	0,032	0,057
Stress	215,982[f]	2	107,991	1,509	0,227	0,012

Table 4. Results of tests in one-dimensional structure of the MANOVA

№	Indicators according to the method of M. Lusher	Rating		
		diamond mining production	Oil production	Forestry production
1	Heteronomous / autonomous	3	2	1
2	Concentricity / eccentricity	3	1	2
3	Imbalance / balance of personal qualities	1	3	2
4	Vegetative balance	1	2	3
5	Efficiency	1	2	3

The results of the one-dimensional tests in the structure of MANOVA (Table 4) indicate that shift workers in the forestry are characterized by a heteronomous predominance and a parasympathetic nervous system. Workers of the diamond production are featured by autonomy, eccentricity, the predominance of sympathetic tone and mental performance. Workers of oil and gas production are characterized by concentricity and by balanced personal qualities.

Conclusions.

Thus, the results of the study show that the best type of adaptation strategy for shift workers in forestry, oil and gas production is an economical differentiated strategy. It is expressed primarily in the same regulatory processes developed during the period of entry into the profession in a variety of situations and in a conscious allocation of internal resources all through the shift period. An emergency differentiated type of adaptation strategy is optimal for shift workers in the diamond mining production. This type is characterized by the use of various regulatory processes depending on professional situations and wasteful spending of inner resources during a shift.

The adaptation strategies can be attributed to the volitional characteristics of psychological readiness for a shift work in the Far North and the Arctic. The information on strategies identified should be provided to the psychological training courses while training specialists for oil, diamond and timber industry. In this case most of the study courses should be given in the form of active workshops and trainings with a view to a conscious use of inner resources and technologies of self-regulation. These activities will enable to form a psychological readiness for shift work in the Far North and the Arctic.

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