

**Valerii Samsonkin¹, Halina Popova², Rozaliia Shcherbyna³, Oleksii Horetskyi⁴,
Oleksandra Soloviova⁵**

¹ Professor, Department of Transport Technologies and Transportation Control, State University of Infrastructure and Technologies, 9, Kyrylivska str., Kyiv, 04071, Ukraine. ORCID: <http://orcid.org/0000-0002-1521-2263>

² Associate Professor, Department of Psychology and Pedagogy of Social System Management, National Technical University «Kharkiv Polytechnic Institute», 2, Kyrpychova str., Kharkiv, 61000, Ukraine. ORCID: <https://orcid.org/0000-0003-3814-4037>

³ Associate Professor, Department of Transport Technologies and Transportation Control, State University of Infrastructure and Technologies, 9, Kyrylivska str., Kyiv, 04071, Ukraine. ORCID: <https://orcid.org/0000-0003-4505-921X>

⁴ Associate Professor, Department of Transport Technologies and Transportation Control, State University of Infrastructure and Technologies, 9, Kyrylivska str., Kyiv, 04071, Ukraine. ORCID: <http://orcid.org/0000-0002-2656-6120>

⁵ PhD candidate, Department of Transport Technologies and Transportation Control, State University of Infrastructure and Technologies, 9, Kyrylivska str., Kyiv, 04071, Ukraine. ORCID: <https://orcid.org/0000-0002-7933-3929>

***Corresponding author:** solovyova0108@gmail.com

ANALYSIS OF EMPIRICAL RESEARCH OF STUDENTS AND GRADUATES OF THE FACULTY OF «RAILWAY TRANSPORT MANAGEMENT» ABOUT THE STATE OF PSYCHOLOGICAL CLIMATE IN RAILWAY SUBDIVISIONS

In order to develop corporate culture in the Ukrainian railway subdivisions, this article analyzes the empirical research of the psychological working climate at the regional branch of «South-Western Railway» JSC «Ukrainian Railways». The empirical research was conducted in the form of a questionnaire, based on three methods: assessment of the psychological atmosphere in the team (according to A. F. Fiedler), determination of the index of group cohesion (K. E. Sishor), assessment of job satisfaction (V. A. Rozanova). The research results showed the level of work satisfaction of employees of the selected unit (specialists in transport technology) for various factors.

Keywords: *organizational culture, psychological climate, work satisfaction, empirical research, transport technologies.*

Introduction. This article is the fourth in a series of articles on the state of corporate (organizational) culture in the railway transport of Ukraine. The first article [1] was devoted to the research of the necessity to use the principles of organizational culture in the system of railway transport specialists formation. The research findings showed that obtaining positive results in the reform of Ukraine's railway transport is possible only with the use of effective personnel management, the implementation of which is based on the principles of corporate culture.

The second article [2] concerned the impact of staff on the socio-economic activities of transport subdivisions. In the course of the research it was established that the labor potential is a vector quantity, based on which, the task of organizational culture is to set the right direction of development and the nature of the labor potential of the transport organization. The research results was proposed

method of calculating the labor potential of the organization over time, and also was formalized universal criteria for the growth of labor potential.

The third article [3] in a set of articles is devoted to the analysis of the directions of influence of organizational culture on the activity of transport enterprises. Based on the research, it was found that:

a) the total growth of individual capabilities of employees leads to an increase in the potential of workers' enterprises as a whole, an effective tool for which is the organizational culture;

b) organizational culture can help increase the competitiveness of the transport company, as increasing labor potential has a positive effect on the results of economic activity of the enterprise.

This article is devoted to continuing the research of the necessity to improve and develop corporate culture in transport enterprises. The relevance of the chosen research topic is due to growing competition in the transport sector, which requires, in turn, a set of measures to increase the competitiveness of transport enterprises. This requires not only investment in equipment and technological processes, but also the implementation of a wide range of organizational and managerial and socio-cultural innovations.

Analysis of recent research and problem statement. In the previous articles of the authors [1-3] the theoretical bases of organizational culture, features of its formation and application at the enterprises of railway transport of Ukraine are stated.

The research [4] identifies the main directions of organizational (corporate) culture application in railway transport in the future, and structural developments for the corporate culture management in the scale of the company. An example of the organizational culture methods use in the passenger economy of a railway company is also given.

Publications [5-10] provide an overview of the application of psychological methods and tools, as well as vocational training in Ukraine and abroad. An attempt is made to analyze and suggest the use of certain aspects of these components of organizational culture.

In [14] the authors determined that in railway transport corporate culture is a system of values, beliefs, ideas, symbols, norms of behavior, traditions and rituals that are formed at the enterprise, reflect its individuality, are reflected in the behavior and interaction of employees with one another and with the external environment. The article focuses on the assessment of corporate culture on such key elements as the most important characteristics of the organization, the overall leadership style in the organization, management style in the organization, the unifying essence of the organization, strategic goals, success criteria. In addition to these elements, an analysis of the propensity for a certain type of organizational culture was also conducted. According to the research, the existing corporate culture in the field of railway transport tends to a hierarchical type. A number of works by scientists of different years are devoted to the study of corporate culture in various sectors of the economy and railway transport [15-21]. For example, Hrebinska S. I., Kalinichenko L. L., Vanchenko L. V., Hrebenyuk H. M., Korin M. V., Tokmakova I. V., Kuzub A. V. and others. Authors of most of these works look into the socio-economic aspect, motivation as one of the factors in the development of the individual employee, which affects the activities of the railway company, the psychological aspects of employees and more.

In the research [22], the authors analyzed the state of corporate culture in transport companies in Slovakia and Germany. The authors found in Slovakia a hierarchical corporate culture with dominant features, such as compliance with rules and regulations (top managers of these companies continued to show a tendency to use it), and in Germany since approximately 2014 was introduced and developed clan corporate culture (top managers focused on the needs of employees and their development). The authors of the research recommend that top managers in Germany stay in this trend, and for top managers in Slovakia it is proposed to change their perception and consider employees a key factor. Employees are the owners of new creative ideas that allow companies to build their competitive advantage.

If the authors of the previous research surveyed top managers, the authors of the article [23] conducted a survey of 64 European transport companies of different ages. The aim of the work was to identify differences in the perception of the desired level of corporate culture by different generations. It has been suggested that members of each generation differ not only in their behavior but also in their views and values. Managers adapt the management style, leadership and motivation of employees so that well-

motivated employees can properly influence the efficiency of enterprise processes. According to the research results, the authors found that all generations of respondents working in European transport companies prefer a clan corporate culture for five years. This culture emphasizes employees, customers and traditions. Loyalty and teamwork are considered the main tools for business success. The authors state that the hypothesis of the existence of generational differences in the perception of corporate culture has not been confirmed.

We can also highlight the work of foreign scholars in the field of corporate culture on the activities and efficiency of enterprises in various fields, namely Yanica P. Dimitrova, Silvia Lorincová, Miloš Hitka, Žaneta Balážová, Maria Magdalena Criveanu, Katarzyna Turoń, Do Huu Hai, Nguyen Minh Hai, Nguyen Van Tien and others [24-28].

The purpose and tasks of the study. To determine the state of some aspects of corporate culture at the Regional Branch of the South-Western Railway in the opinion of specialists in transport technology.

Materials and methods of research. An empirical study in the form of a questionnaire was conducted in June-July 2021. The questionnaire was based on three methods: assessment of the psychological atmosphere in the team (according to A. F. Fiedler), determination of the index of group cohesion (K. E. Sishora), assessment of job satisfaction (V. A. Rozanova).

49 people working in various positions in the regional branch of the South-Western Railway (hereinafter – «SWR») of the Joint-Stock Company «Ukrainian Railways» were interviewed. The average age of the subjects was 28.6 years (minimum – 21 years, maximum – 42 years); average length of service – 7.6 years (minimum 1 year, maximum 19 years).

The control group of respondents consisted of recent graduates or part-time students majoring in «Transport Technology» Faculty of «Railway Transport Management» of the State University of Infrastructure and Technology. The survey was voluntary and was conducted by the authors in May-June 2021. G. V. Popova, Candidate of Psychological Sciences, Professor of NTUU KPI, assisted in the preparation of the questionnaire.

The corresponding empirical database (DB) of answers of respondents in Excel is formed. The control group of employees is divided into 5 subgroups according to experience: 1 subgroup (up to 3 years) – 6 people; 2 subgroups (3-5 years) – 18 people; 3 subgroups (6-10 years) – 11 people; 4 subgroups (11-15 years) – 7 people; 5 subgroups (more than 15 years) – 6 people.

Accordingly, five database tables were formed: DB1, DB2, DB3, DB4, DB5, with which calculations were performed.

1. At the first stage of the study, the psychological atmosphere was determined to find out what prevails in the team of employees with different work experience. To do this, a method of assessing the psychological atmosphere in the team by A. F. Fiedler [11].

The essence of the questionnaire: the proposed table (table 1) shows the opposite content of a couple of words that can be used to describe the atmosphere in the team. The closer to the right or left word in each pair is the sign «+», the more pronounced this sign in the team.

Table 1. Test material (questionnaire) by A. F. Fiedler

	1	2	3	4	5	6	7	8	
Friendliness									Animosity
Consent									Disagreement
Pleasure									Displeasure
Productivity									Unproductivity
Warmth									Coldness
Cooperation									Inconsistency
Mutual support									Malevolence
Enthusiasm									Indifference
Interest									Boredom

(Source: [11])

The answer to each of the 9 items is evaluated from left to right from 1 to 8 points. The left is the sign «+», the lower the score, the more favorable the psychological atmosphere in the team, according to the answer. The final indicator ranges from 9 (the most positive assessment) to 72 (the most negative).

Evaluation criteria for the psychological atmosphere of employees:

- high level = from 9 to 36 points;
- average level = from 37 to 54 points;
- low level = from 55 to 72 points.

In the table 2 and Fig. 1 shows the % ratio of employees with different length of service and their results.

Table 2. Levels of feeling the well-being of the psychological atmosphere in employees with different experience according to the method of A. F. Fiedler, %

The level of psychological atmosphere	Subgroups				
	1 subgroup (up to 3 years)	2 subgroup (3-5 years)	3 subgroup (6-10 years)	4 subgroup (11-15 years)	5 subgroup (more than 15 years)
High	16,7 %	0 %	0 %	14,3 %	0 %
Average	16,7 %	33,3 %	72,7 %	71,4 %	50 %
Low	66,6 %	66,7 %	27,3 %	14,3 %	50 %

Graphical display of data is shown in Fig. 1.

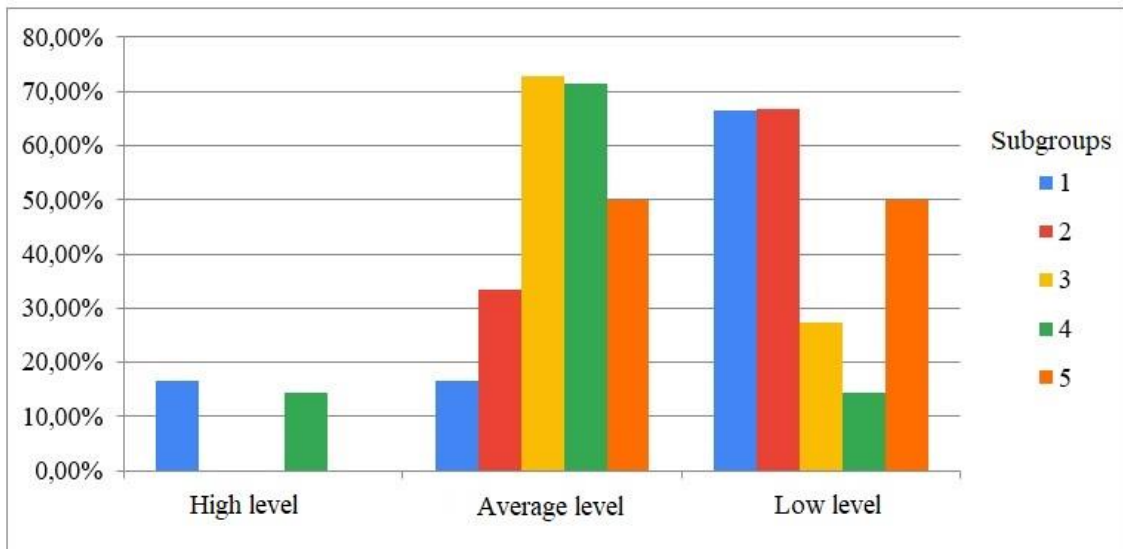


Fig. 1. Percentage of levels that have employees with different work experience

Comments and conclusions: almost 90 % of employees with short work experience (up to 3 years) assess the psychological atmosphere as satisfactory and lower. Of the most experienced group (more than 15 years of experience), no one rated the psychological atmosphere as high. This should alert the management of the SWR.

2. Employee satisfaction with the method of Rozanova was determine at the second stage of the reserch [12].

To do this, it is proposed to answer 14 questions (table 3) with answer options (for each question):

- a) 1 – extremely dissatisfied;
- b) 2 – not satisfied;

- c) 3 – not completely satisfied;
- d) 4 – satisfied;
- e) 5 – completely satisfied.

The numerical order of option is equal to the score (points).

Table 3. Research of determining employee satisfaction with the method of Rozanova

Questions	Points				
	1	2	3	4	5
1. Your satisfaction with the company (organization) where you work, in general					
2. Your satisfaction with the working environment (temperature, noise, comfort, etc.)					
3. Your job satisfaction					
4. Your satisfaction with the coherence of the staff members					
5. Your satisfaction with your chief's leadership style					
6. Your satisfaction with the professional competence of your chief					
7. Your satisfaction with the salary (in terms of its compliance with your labor contribution)					
8. Your satisfaction with the salary in comparison with how much for the same work is paid at other enterprises					
9. Your satisfaction with job promotion (professional promotion)					
10. Your satisfaction with the opportunities for promotion					
11. Your satisfaction with how you can use your experience and abilities					
12. Your satisfaction with the requirements of work to the intellect					
13. Your satisfaction with the length of the working day					
14. To what extent would job satisfaction affect your search for another job?					

(Source: [12])

According to this test, you can score from 14 to 70 points.

This test can also be used to assess the satisfaction of the whole team or group. In this case, the arithmetic mean of the indicators are used. The evaluation of the results is carried out on the following scale:

- a) 15 – 20 points – extremely dissatisfied (1);
- b) 21 – 32 points – not satisfied (2);
- c) 33 – 44 points – not completely satisfied (3);
- d) 45 – 60 points – satisfied (4);
- e) more than 60 points – completely satisfied (5).

In the table 4 presents the results of testing processing on 14 questions.

Table 4. General test results

Assessment	Subgroups				
	1 subgroup (up to 3 years)	2 subgroup (3-5 years)	3 subgroup (6-10 years)	4 subgroup (11-15 years)	5 subgroup (more than 15 years)
Arithmetic mean	41	48,7	42,5	40,1	42,7

Graphical display of results – in Fig. 2.

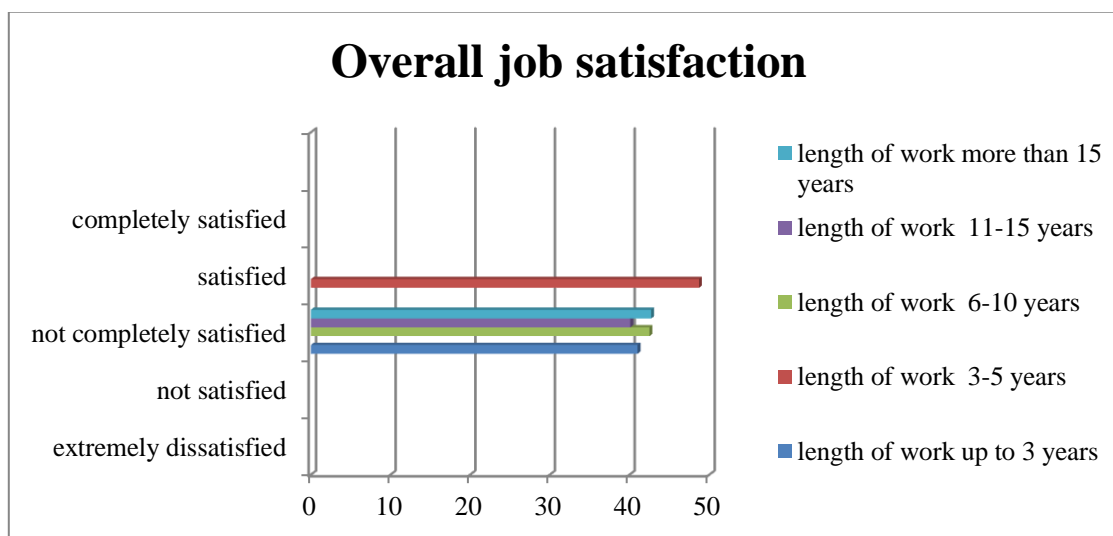


Fig. 2. Overall job satisfaction of employees in groups of length of work

Comments and conclusions: the second group of employees (3-5 years of work) is mostly satisfied with their work, all others are not completely satisfied. The main reasons may be low wages and uncertainty about the future.

In the table 5 provides information on satisfaction with each of the factors of Rozanova's test.

Table 5. Factors of employee satisfaction, %

Factors	Subgroups									
	1		2		3		4		5	
	(1)+(2)	(4)+(5)	(1)+(2)	(4)+(5)	(1)+(2)	(4)+(5)	(1)+(2)	(4)+(5)	(1)+(2)	(4)+(5)
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
1. Your satisfaction with the company (organization) where you work, in general	16,7	50,0	11,1	61,1	18,2	63,6	14,3	42,9	0,0	50,0
2. Your satisfaction with the working environment (temperature, noise, comfort, etc.)	50,0	50,0	22,2	50,0	18,2	45,5	28,6	42,9	16,7	50,0
3. Your job satisfaction	16,7	33,3	0,0	77,8	0,0	81,8	28,6	14,3	0,0	50,0
4. Your satisfaction with the coherence of the staff members (team)	16,7	33,3	0,0	72,2	18,2	45,5	42,9	42,9	16,7	33,3
5. Your satisfaction with your chief's leadership style	16,7	50,0	22,2	50,0	36,4	36,4	42,9	42,9	50,0	33,3
6. Your satisfaction with the professional competence of your chief	16,7	66,7	16,7	55,6	45,5	36,4	0,0	42,9	50,0	33,3

Continuation of the table 5

1	2	3	4	5	6	7	8	9	10	11
7. Your satisfaction with the salary (in terms of its compliance with your labor contribution)	66,7	0,0	44,4	27,8	72,7	18,2	100,0	0,0	83,3	0,0
8. Your satisfaction with the salary in comparison with how much for the same work is paid at other enterprises	66,7	33,3	44,4	27,8	63,6	9,1	71,4	0,0	83,3	0,0
9. Your satisfaction with job promotion (professional promotion)	33,3	16,7	11,1	55,6	45,5	18,2	42,9	14,3	16,7	33,3
10. Your satisfaction with the opportunities for promotion	33,3	33,3	16,7	50,0	72,7	18,2	57,1	0,0	16,7	16,7
11. Your satisfaction with how you can use your experience and abilities	50,0	16,7	5,6	66,7	18,2	45,5	14,3	28,6	16,7	83,3
12. Your satisfaction with the requirements of work to the intellect	33,3	33,3	5,6	77,8	36,4	36,4	14,3	28,6	50,0	33,3
13. Your satisfaction with the length of the working day	16,7	33,3	16,7	72,2	9,1	72,7	14,3	71,4	16,7	83,3
14. To what extent would job satisfaction affect your search for another job?	50,0	33,3	5,6	55,6	27,3	27,3	28,6	14,3	0,0	0,0

Below in Figures 3 – 16 present a graphical representation of Rozanova's test factors. In this case, comments on each factor are provided below the figure, where the results are not obvious.

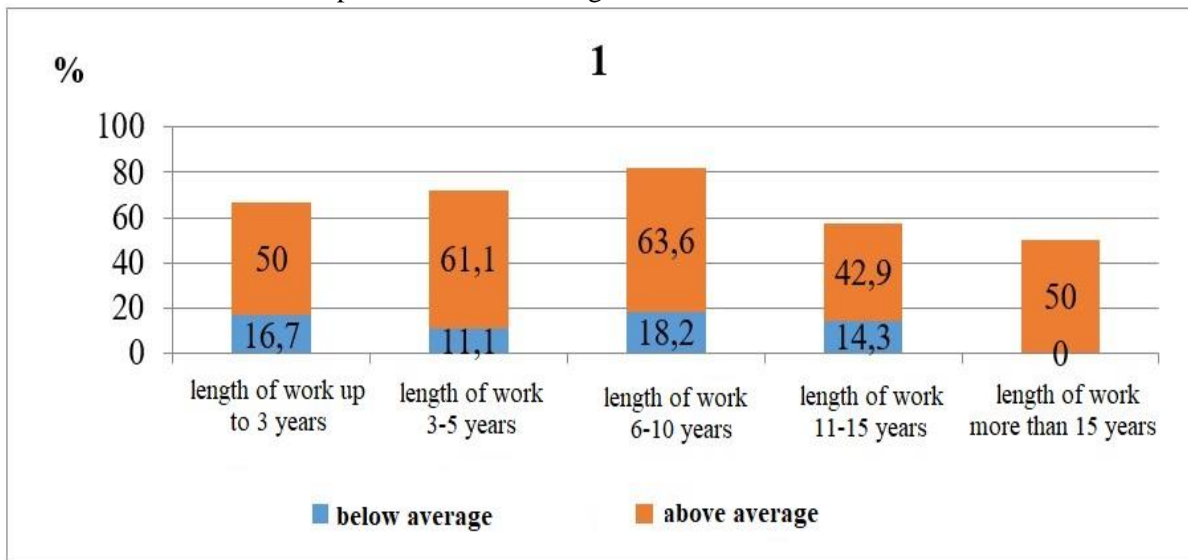


Fig. 3. Percentage of satisfaction with the organization as a whole

Analyzing the test results in Fig. 3 we can conclude that the more experience, the greater the level of satisfaction with the organization. Personnel management of JSC "UZ" should pay attention to the motivation of young people.

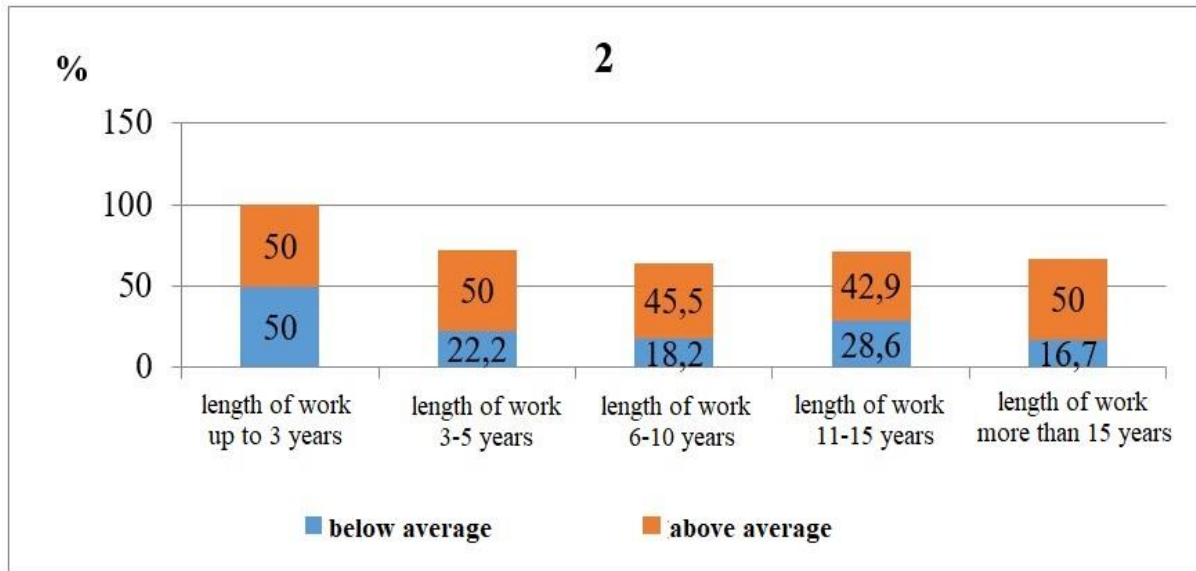


Fig. 4. Percentage of satisfaction with the working environment

The level of satisfaction with the working environment is higher than the level of satisfaction with the organization. The reason for this is that people like the work itself, which is confirmed by Fig. 5–6.

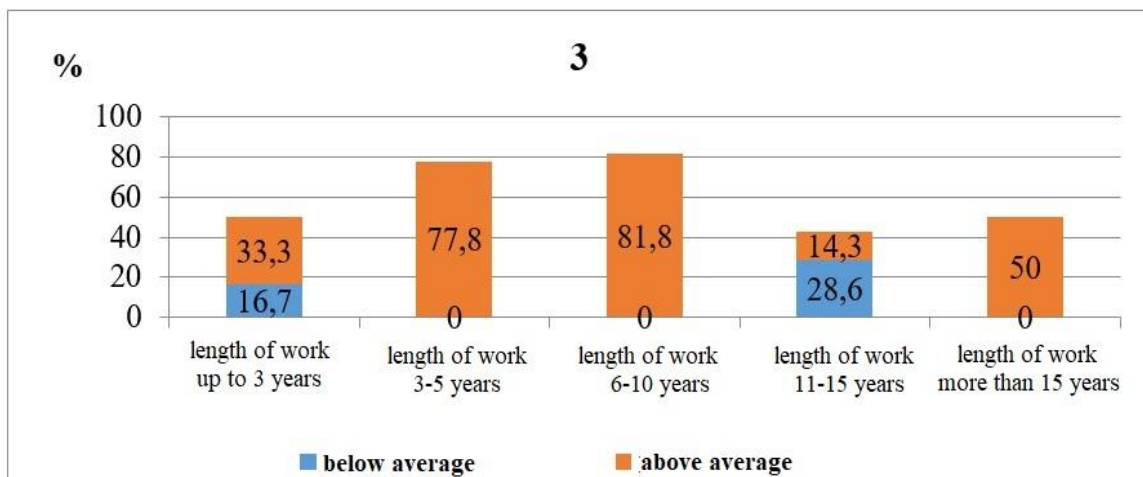


Fig.5. Percentage of job satisfaction

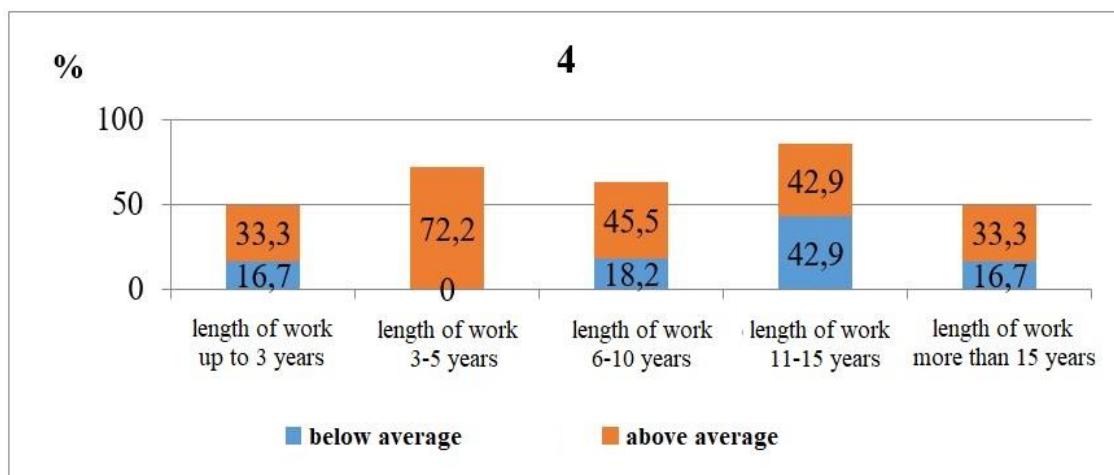


Fig.6. Percentage of satisfaction with the coherence of the staff members (team)

The authors did not expect such a high level of satisfaction with the coherence of those production units where students and graduates of the specialty «Transport Technology» work.

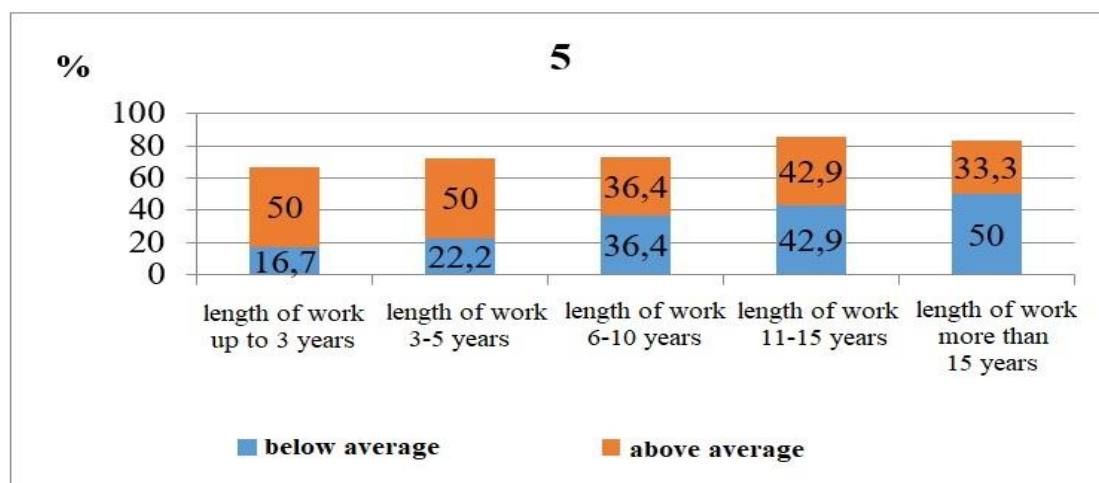


Fig. 7. Percentage of satisfaction with the chief's leadership style

As can be seen from Fig. 7 negative assessment of leadership style is directly proportional to experience, it has increased 3 times in a conditional 12 years. This is clearly a dangerous situation for lower- and middle-level SWR leaders.

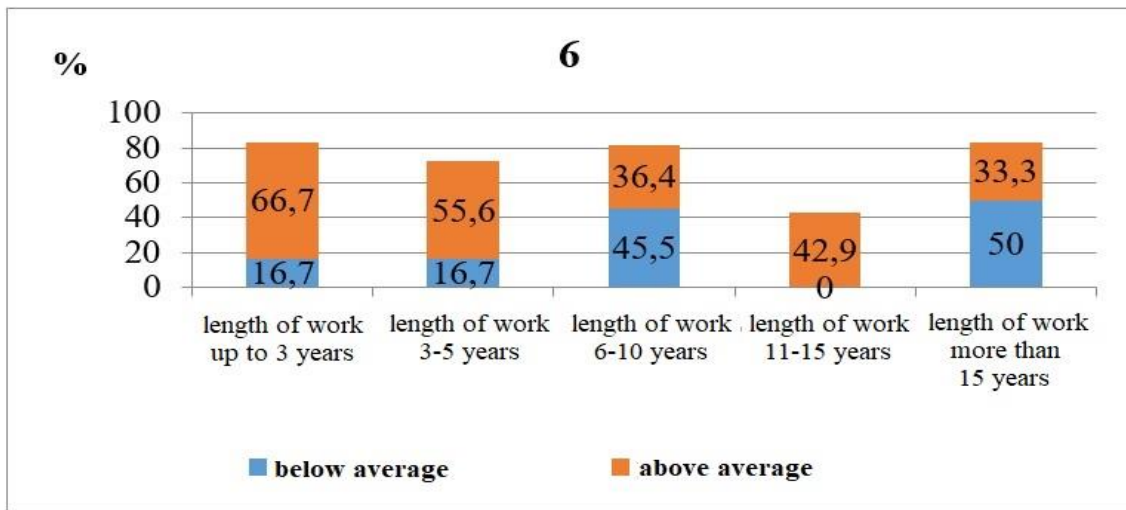


Fig. 8. Percentage of satisfaction with the professional competence of your chief

Estimation in Fig. 7 fully correlates with the assessment of the chief's competence. Quantitative coincidences may be explained by the fact that respondents did not have the opportunity to meet in person with the moderator of the questionnaire to provide comments on the difference between the style and competence of the chief.

The assessment of salary satisfaction is fully expected, it is explained by the difficult economic situation in JSC «UZ» and in Ukraine as a whole. Young professionals are happy with their earnings, because this is their first experience and most of them have not yet started a family.

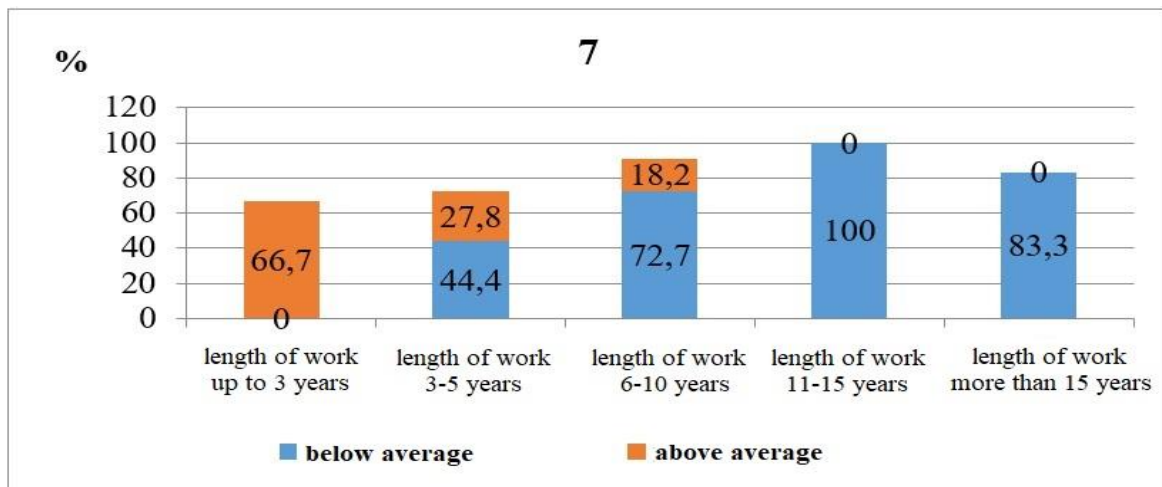


Fig. 9. Percentage of salary satisfaction

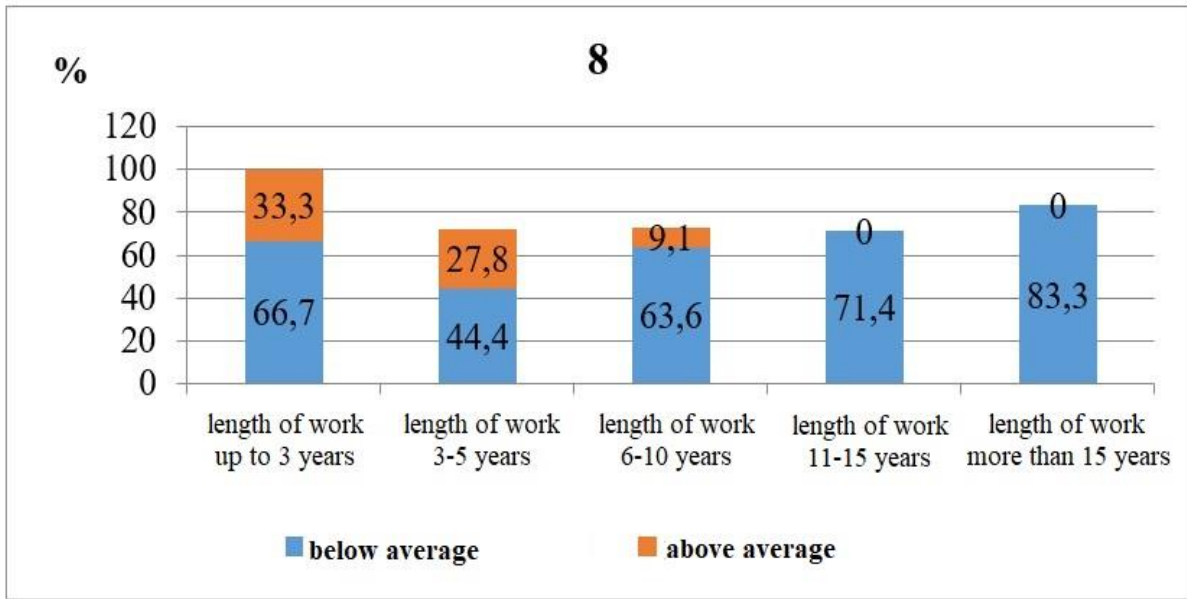


Fig. 10. Percentage of salary satisfaction in comparison with how much for the same work is paid at other enterprises

Indicators of this factor are also predictable. They are explained by the lack of wage growth for several years due to the decline traffic volume in rail transport. At the same time, there are some areas (IT, banks, trade, logistics companies), as well as new businesses with foreign investment and management, where wages are quite high.

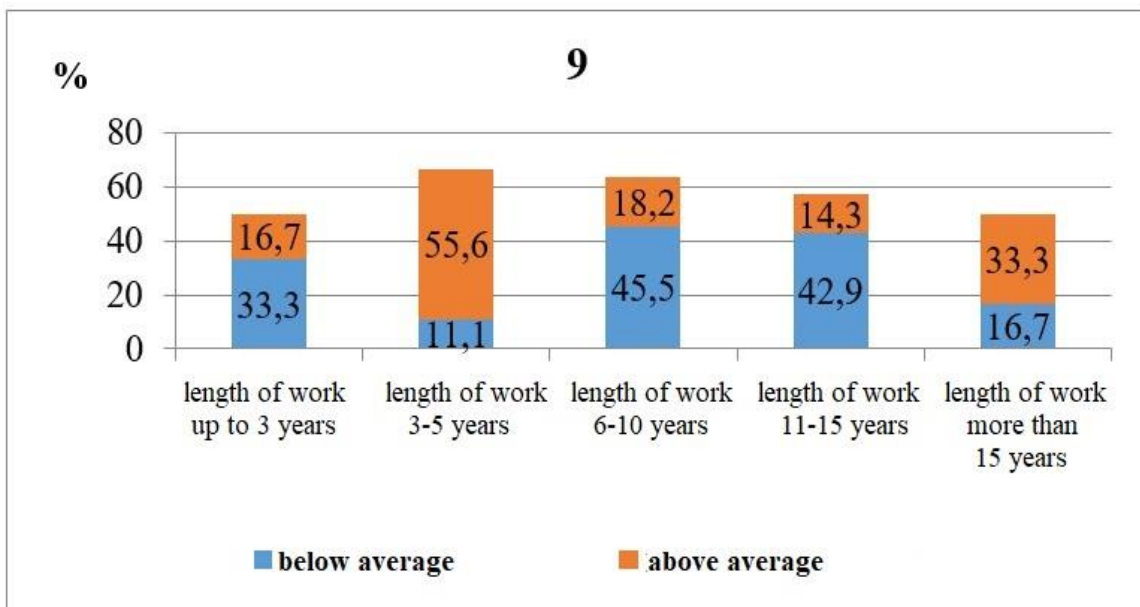


Fig. 11. Percentage of satisfaction with official (professional) promotion

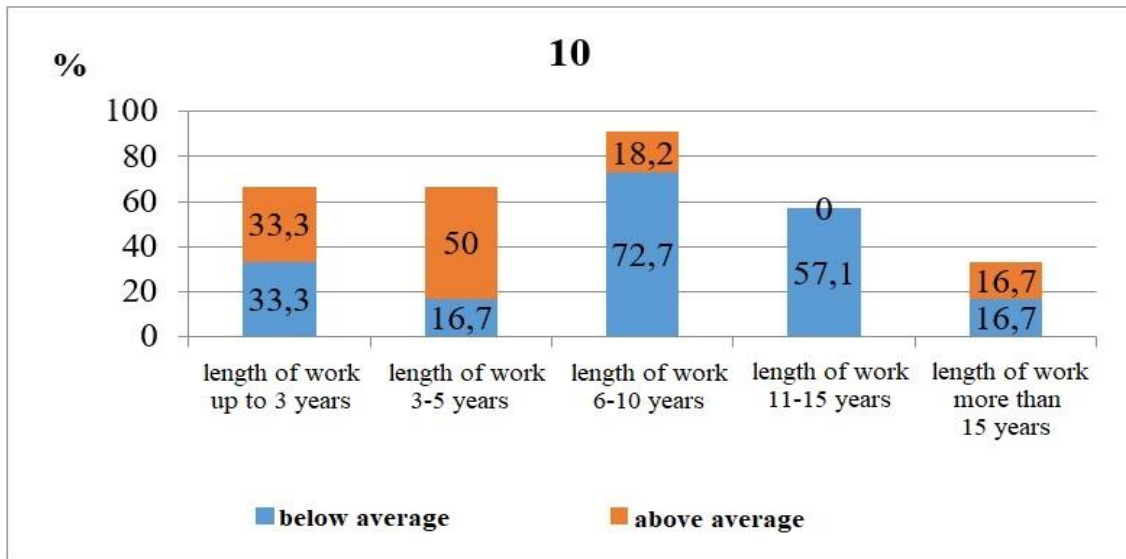


Fig. 12. Percentage of satisfaction with the opportunities for promotion

The greatest dissatisfaction with the opportunities for promotion belong to employees with experience of 6-15 years, because they are professionals with experience, intention and confidence in their abilities. This is also the expected empirical result. But the level is too high – more than 70 % in the third subgroup and almost 60 % in the fourth.

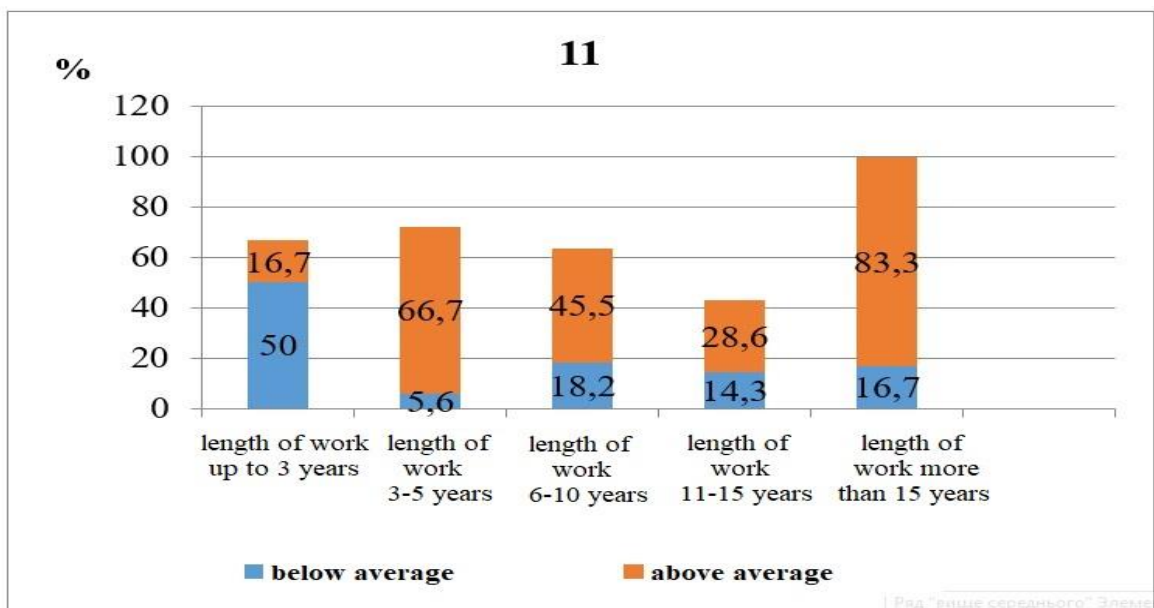


Fig. 13. Percentage of satisfaction with how you can use your experience and abilities

Data in Fig. 13. correlate with the data in Fig. 12. Positive self-esteem of people has increased almost 5 times from the first to the fifth subgroup in accord with length of work.

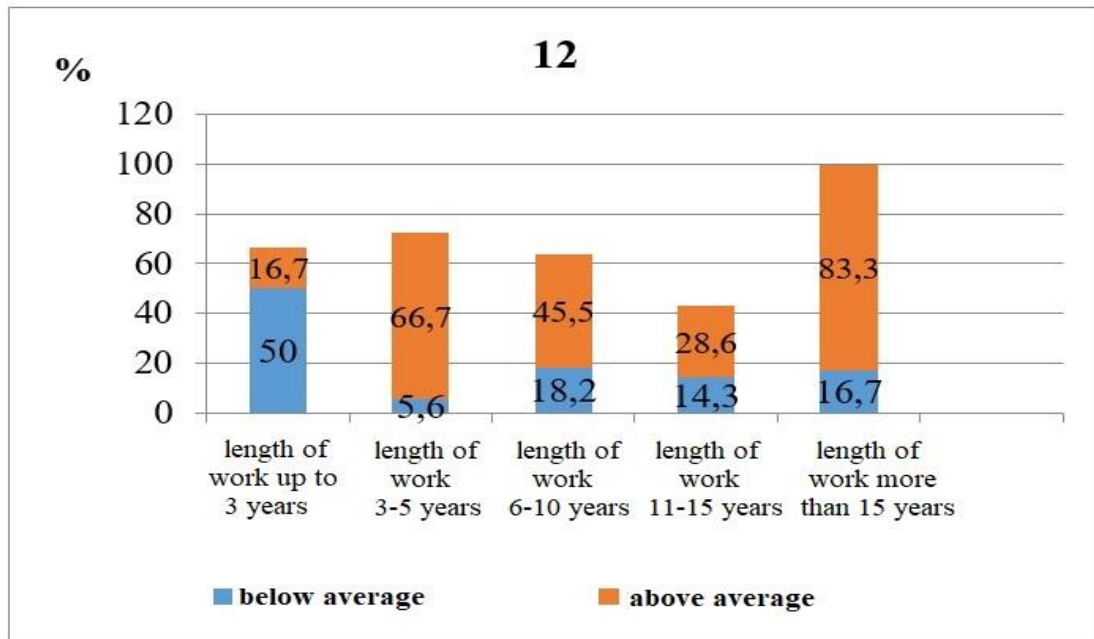


Fig. 14. Percentage of job satisfaction to intelligence

50 % of young professionals believe that their intellectual level is higher than the tasks offered to them. This can be explained by the high risk of transport technology and the desire of management to prevent accidents, as well as the level of automation, which young people know better than people with significant experience.

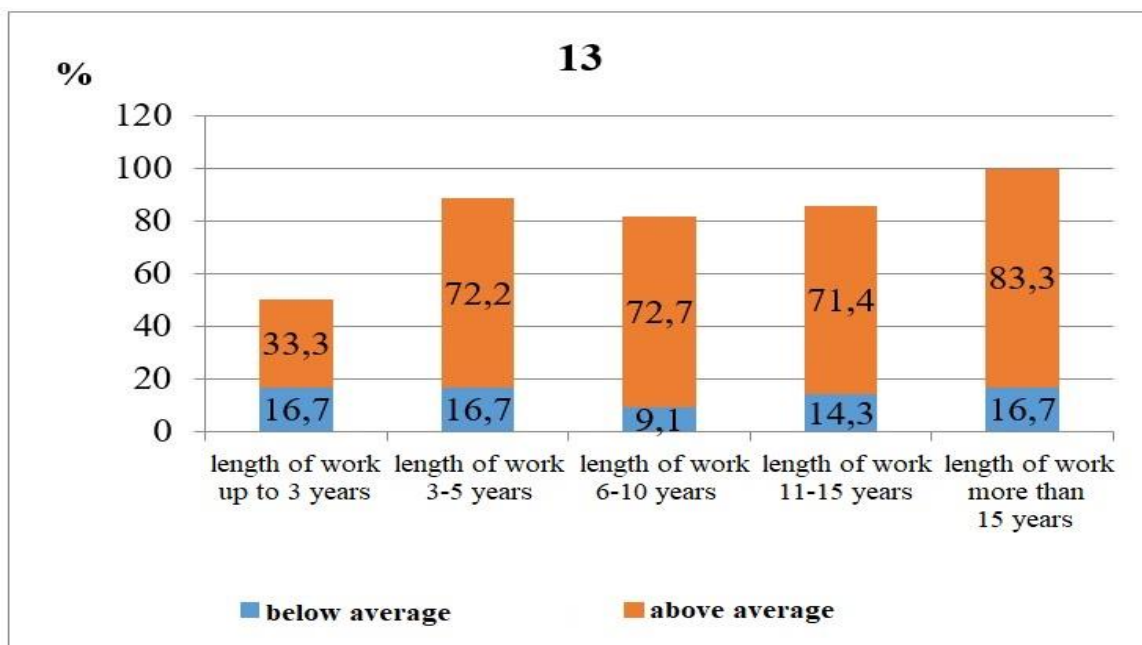


Fig. 15. Percentage of satisfaction with the length of the working day

Almost all subgroups of employees are more satisfied than dissatisfied with the length of the working day. This is due to the tradition of railway transport and the "focusing" of trade unions on this indicator.

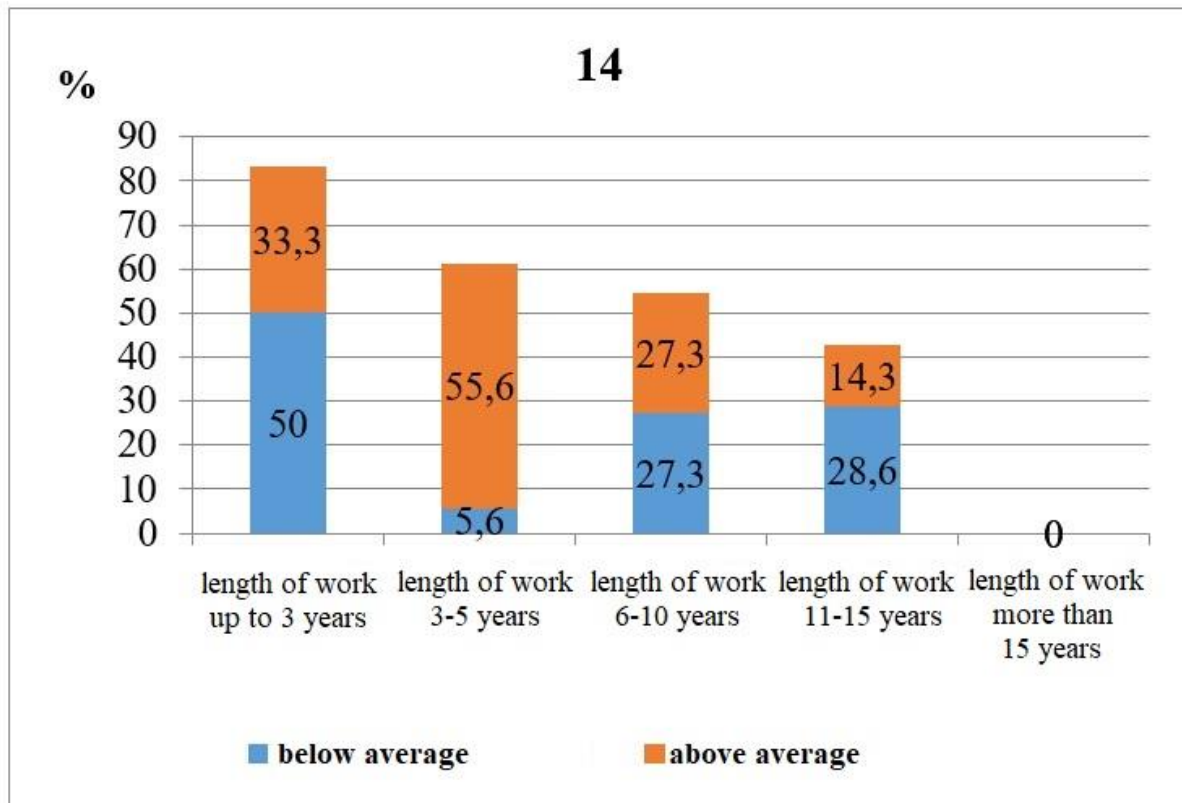


Fig. 16. Percentage of how job satisfaction would affect your search for another job

Young workers (50 %) are ready to look for another job, with experience of 11-15 years – twice as little, and 15-year-old professionals do not want it. We should also pay attention to the fact that there are many places in Ukraine where there is no other job than rail transport. The situation is quite logical, for a more definitive estimate requires comparison with another production area.

3. In the third stage of the research was determined cohesion of employees in order to define whether there is a union of people into a single whole or, conversely, there is a difference in the interrelation in the team with different work experience. To do this, a method to determine the cohesion of Sishor was used [13].

To do this, each of the test subgroups must choose one answer to each of the five questions - table 6.

The number of answer points is given in parentheses.

Scale or levels of group cohesion [13]:

- more than 15.1 points – high;
- 11.6-15 points – above average;
- 7-11.5 – average;
- 4-6.9 – below average;
- 4 and below – low.

The average scores of employees with different length of work and their results are shown in the table 7 and in Fig. 17.

Table 6. List of questions to determine cohesion

<p><u>1. How would you rate your group affiliation?</u></p> <p>a) I feel like I am a member of it, part of the group (5).</p> <p>b) I participate in most activities (4).</p> <p>c) I participate in some activities and do not participate in others (3).</p> <p>d) I do not feel that I am a member of the group (2).</p> <p>e) I'm living and existing separately from it (1).</p> <p>f) I don't know, it's hard to answer (1).</p> <p><u>2. Would you move to another group if such an opportunity arose (without changing other conditions)?</u></p> <p>a) Yes, I would like to go very much (1).</p> <p>b) Most likely I would move to another group, than I stayed (2).</p> <p>c) I do not see any difference (3).</p> <p>d) Most likely to remain in this group (4).</p> <p>e) I would like to stay in this group very much (5).</p> <p>f) I don't know, it's hard to say (1).</p> <p><u>3. What are the interrelations between members of your group?</u></p> <p>a) Better, than most groups (3).</p> <p>b) Approximately the same as in most groups (2).</p> <p>c) Worse than in most groups (1).</p> <p>d) I don't know, it's hard to say (1).</p> <p><u>4. What is your interrelation with management?</u></p> <p>a) Better than most groups (3).</p> <p>b) Approximately the same as in most groups (2).</p> <p>c) Worse than in most groups (1).</p> <p>d) I don't know. (1)</p> <p><u>5. What is the attitude to the case in your group?</u></p> <p>a) Better than most groups (3).</p> <p>b) Approximately the same as in most groups (2).</p> <p>c) Worse than in most groups (1).</p> <p>d) I don't know. (1).</p>
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(Source: [13])

Table 7. Levels of cohesion perception of people in the group of workers with different length of work according to the method of K. E Sishor (arithmetic mean)

Assessment	Subgroups				
	1	2	3	4	5
Arithmetic mean	14,67	14,78	14	12,14	11,83
Arithmetic mean ± Standard deviation	14,67 ± 3,89	14,78 ± 5,50	14 ± 4,91	12,14 ± 5,26	11,83 ± 3,47

The following formulas (1-2) were used to determine the arithmetic mean and standard deviation (table 7)

$$\text{arith.m.} = \frac{\sum_{i=1}^{n_j} x_{i(j)}}{n_j}; \quad (1)$$

$$\text{st.dev.}_j = \frac{\sum_{i=1}^{n_j} (x_i - \text{arith.m.}_j)^2}{n_j - 1}, \quad (2)$$

where x_i – the number of the subgroup of the control group ($j = 1, 2, \dots, 5$);
 n_j – number of persons in the j -th subgroup.

Graphical display of data is shown in Fig. 17.

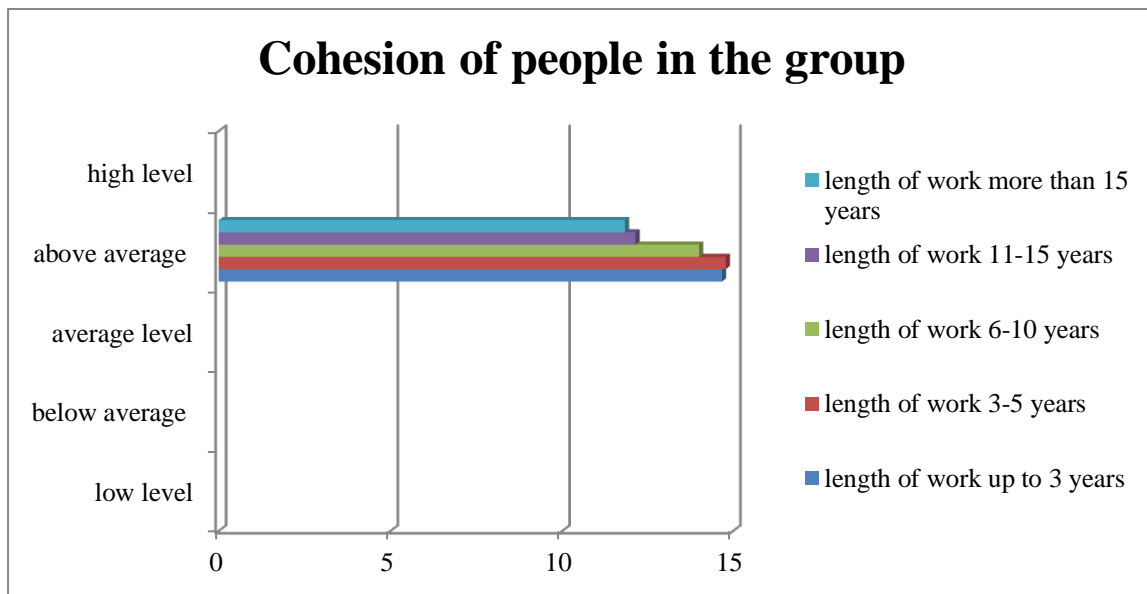


Fig. 17. The average mean of employees with different length of work and their levels

From Fig. 17 it is obvious that the cohesion of people is above average level for all groups of respondents. This is a positive point that should be used by personnel management when choosing forms of organizational work. Also it should be noted that the unanimity of assessment among young professionals is higher, due to youthful maximalism.

Conclusions

1. It should be noted a fairly high level of satisfaction with the work environment, which can be explained by the fact that people like the work itself. This is typical of «real railwaymen» who are patriots and even «fans» of railway transport.
2. The results of a high level of satisfaction with the coherence of those production units where students and graduates of the specialty «Transport Technology» work were unexpected, which can be explained by the professional level or long period of work in one unit.
3. A negative assessment of the style and competence of lower and middle managers of the SWR is directly proportional to the experience of transport management staff: the more experience, the less positive assessment.
4. The greatest dissatisfaction with the opportunities for promotion belong to employees with experience of 6-15 years, because they are professionals with experience, intention and confidence in their abilities. This is also the expected empirical result. However, it should be noted that the level of

dissatisfaction with promotion is too high: more than 70 % of employees with 6-10 years of length of work and almost 60 % – for 11-15 years of experience.

5. 50 % of young professionals believe that their intellectual level is higher than the tasks offered to them.

6. Cohesion of people in linear structural units is above average for all groups of respondents, regardless of experience.

7. Given the dynamic structural and economic changes in JSC «Ukrainian Railways», this research recommended to be done regularly every 2-3 years [29]

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**Валерій Самсонкін¹, Галина Попова², Розалія Щербина³, Олексій Горецький⁴,
Олександра Соловійова⁵**

¹ Професор, Кафедра технологій транспорту та управління процесами перевезень, Державний університет інфраструктури та технологій, вул. Кирилівська 9, м. Київ, 04071, Україна. ORCID: <http://orcid.org/0000-0002-1521-2263>

² Професор, Кафедра педагогіки і психології управління соціальними системами, Національний технічний університет «Харківський політехнічний інститут», вул. Кирпичова 2, м. Харків, 61000, Україна. ORCID: <https://orcid.org/0000-0003-3814-4037>

³ Доцент, Кафедра технологій транспорту та управління процесами перевезень, Державний університет інфраструктури та технологій, вул. Кирилівська 9, м. Київ, 04071, Україна. ORCID: <https://orcid.org/0000-0003-4505-921X>

⁴ Доцент, Кафедра технологій транспорту та управління процесами перевезень, Державний університет інфраструктури та технологій, вул. Кирилівська 9, м. Київ, 04071, Україна. ORCID: <http://orcid.org/0000-0002-2656-6120>

⁵ Аспірант, Кафедра технологій транспорту та управління процесами перевезень, Державний університет інфраструктури та технологій, вул. Кирилівська 9, м. Київ, 04071, Україна. ORCID: <https://orcid.org/0000-0002-7933-3929>

* Автор, відповідальний за листування: solovyova0108@gmail.com

АНАЛІЗ ЕМПІРИЧНОГО ДОСЛІДЖЕННЯ СТУДЕНТІВ ТА ВИПУСКНИКІВ ФАКУЛЬТЕТУ «УПРАВЛІННЯ ЗАЛІЗНИЧНИМ ТРАНСПОРТОМ» ПРО СТАН ПСИХОЛОГІЧНОГО КЛІМАТУ У ПІДРОЗДІЛАХ ЗАЛІЗНИЦІ

З метою розвитку корпоративної культури на підрозділах українських залізниць, в даній статті здійснений аналіз емпіричного дослідження про стан психологічного робочого клімату на регіональній філії «Південно-Західна залізниця» АТ «Українська залізниця». Емпіричне дослідження було проведено у формі анкетування, базу якого склали три методики: оцінка психологічної атмосфери в колективі (по А. Ф. Фідлеру), визначення індексу групової згуртованості (К. Е. Сішора), оцінка задоволеності роботою (В. А. Розанової). Результати проведеного дослідження показали рівень задоволеності роботою працівників обраного підрозділу (фахівців з транспортних технологій) за різними факторами.

Ключові слова: організаційна культура, психологічний клімат, задоволеність, емпіричне дослідження, транспортні технології.