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Empathy, emotional intelligence and decision-making among managers of agro-industrial complex. The role of tolerance for uncertainty in decision-making

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Abstract. The article is devoted to the study of the peculiarities in decision-making by the managers of the agro-industrial complex enterprises. Managing agrarian enterprises is connected with the necessity of considering multiple factors and risks. Therefore, the decision-making under uncertainty and risk is often stressful. Recently, the study of the role of the emotional intelligence and tolerance for uncertainty in decision-making has become relevant and indispensable. The authors conducted the research using four techniques in two groups – managers and students of universities studying on programs involving the future management of people. The positive correlation between emotional intelligence measured by the MSCEIT test and the subjects' age was established. A higher ability to emotional self-control according to the EmIn questionnaire and emotional intelligence according to the MSCEIT test among managers were revealed. Iowa Gambling Test showed significant differences in the preference for the winning decks both by gender (higher for men) and in groups – the students showed a lower degree of self-control, but a greater propensity for risk. People who seek certainty and clarity perceive their loss very unambiguously and try to avoid the risk of such an outcome in the future. Thus, the ability to understand and regulate emotions is important in the choice of solutions; therefore, emotional intelligence plays an important role in decision-making.

1. Introduction

The agro-industrial complex performs an important function – providing the country with food and ensuring food security. It is one of the most sophisticated complexes of the national economy according to its structure. It consists of a set of several sectors – agriculture, industry and services technologically related to agriculture. In addition, it includes two support links – production agro-industrial infrastructure and social infrastructure of rural territories. The effective functioning of the agro-industrial complex is possible only under the condition of the systematic, balanced and proportional development of all its elements.

The basis of the agro-industrial complex is agriculture characterized by certain peculiarities. Three processes are closely interrelated: economic, social and environmental. Managing agricultural enterprises is connected with the necessity of considering multiple factors and risks. These include the following:



- management of agricultural production is often decentralized, as the structural units are geographically deconcentrated, which affects the speed and accuracy of operational decisions;
- the decision-making process is influenced by natural and climatic conditions, resulting in increased uncertainty and risks that complicate the process;
- natural and climatic conditions have an impact on the production of goods in agriculture. In different regions of the country they differ significantly. In particular, in the Krasnoyarsk territory, in many cases they are decisive in the final results of agro-industrial complex activity;
- agricultural enterprises, especially those located in the zone of risky agriculture, have a long production cycle (up to several years), which greatly complicates management;
- agriculture is characterized by the seasonal nature of production, this entails sharp fluctuations in the use of all types of resources for the periods of the year and requires management to constantly search for ways to rationally use them;
- seasonality of agricultural production has an impact on the organization of production, which in turn affects the necessity for personnel and its rational use;
- the development and market behavior of agricultural enterprises is significantly influenced by the state agrarian policy;
- a large proportion of the manufactured products are for domestic consumption;
- the specificity of agriculture includes the variety of ownership forms and economy management;
- management should take into account the peculiarities and differences of lifestyle in urban and rural areas, customs and traditions, which require a specific approach to many issues, including in the social sphere [1].

Definitely, this is not a complete list of tasks, difficulties and risks faced by the modern manager of agricultural enterprises in decision-making.

Managerial decision-making (including personnel) in conditions of uncertainty and risk is associated with a high level of physical and psychological tension and is often stressful. According to research of O.A. Kovaleva, the situation associated with the interaction with subordinates as a stress factor (conflicts, dismissals, disciplinary actions) was noted by 45 % of top managers and by 55 % of middle managers, decision-making and solving professional problems by 67 % of middle managers [2].

At the same time, the motivational and personality sphere of a person is inevitably included in the psychological regulation of human choice. O. K. Tikhomirov developed the idea of functioning of a single intellectual and personal potential of man. When making a decision, a person relies on all his intellectual and personal potential. In the course of decision-making, the influence of personal and intellectual components is manifested in neo-formations in the course of decision-making or the creative product design. The very notion of neo-formation suggests that the subject in some way overcomes uncertainty, going beyond the task or situation [3].

In recent years, many studies have aimed at identifying personal, situational and cognitive factors that determine decision-making in an uncertain environment. Emotional intelligence, tolerance for uncertainty, empathy, prognostic abilities, correlation of rational thinking and intuition are the topical subjects of research [4, 5].

For example, S.A. Manichev has recently conducted the study of the correlation between rational and intuitive style of management in decision-making with indicators of emotional intelligence in managers. The results showed that managers' understanding of emotions is more dependent on the tendency to a rational style of thinking [5].

If we start from the definition of empathy given by M. Davis saying that empathy is a set of the connected constructs related to the response to others, nevertheless, clearly different from each other, it is interesting to see the role of different components of empathy in decision-making, when a person

is required to predict someone else's actions. And important here is not only the ability to influence the components of empathy on the success of the forecast and the effectiveness of decision-making, but also the form in which a person receives a subjective representation of the process of own decision-making presumably through empathy [6].

V. N. Seleznev asserts that the model of manager's training involves reliance not only on the model of the specialist, but also on the psychological model of the specialist's personality, including the description of his emotional and volitional qualities that ensure the successful implementation of tasks arising in the professional sphere [7]. From this point of view, the differences between students studying in specialty, involving the further management of people, and acting managers are of interest. It is also worth noting that the manager's profession peculiarity is the increased responsibility, requirements for decision-making under uncertainty [7]. The decision-making process, its peculiarities presumably change with professional development, especially when it comes to decision-making in a situation of interpersonal interaction.

2. Materials and methods

In order to study the decision-making process, the IOWA Gambling Task test is actively used by psychologists, where the player is invited to make a choice based on determining the probability with which he will make a profit or suffer losses. With the process of the game, a person begins to estimate the differences between the decks and to assume which of them is more likely to win, and which is less. His choice changes accordingly.

This paper presents the analysis results of the decision-making process in the situation of uncertainty on the material of tasks, using the IOWA Gambling Task.

The purpose of the research is to study the peculiarities of the acting managers' emotional sphere and its impact on their decision-making in the situation of uncertainty.

60 people on a voluntary basis took part in the research and were divided into two groups.

The control group included 30 people. Of these, 21 girls and 9 boys – students of higher educational institutions, enrolled in programs involving the future management of people (personnel management, management, state and municipal management, etc.), the average age $M=21.5$, $SD=3.5$.

The experimental group also consisted of 30 people, 15 men and 15 women, who held executive positions in various companies. Subjects being tested differed in the nature of the position: most of them were heads of departments, but also there were directors and deputies. Average age: $M=41.1$ $SD=8.4$. Also the total number of subordinates in the test, including indirect subordinates was taken into account, average: $M=189.6$.

Five techniques were used in the work:

- the test of emotional intelligence by Lucin [8]. Psycho-diagnostic technique based on self-reporting, designed to measure own and other people's emotions and manage them;
- the Russian version of the emotional intelligence test by Mayer – Salovey – Caruso [9]. This technique is based on one of the most extensive and detailed theoretical structures describing emotional intelligence;
- Iowa Gambling Task – the Russian version in the adaptation of T.V. Kornilova, S.A. Kornilova [10] This technique simulates the situation of decision-making in the situation of uncertainty;
- the new questionnaire of tolerance for uncertainty [11].
- the Russian version of the questionnaire “Interpersonal Reactivity Index” (IRI) by M. Davis [6].

The differences between the groups in terms of psychometric techniques are shown in table 1.

Table 1. The differences between the groups on indicators of psychometric techniques (t-criterion of Student).

	Average value, managers	Average value, students	Significance of differences on the T – criterion
Identification of emotions, MSCEIT	M=0.44 SD=0.051	M=0.41 SD=0.069	0.06
Solving problems using emotions. MSCEIT	M=0.36 SD=0.047	M=0.34 SD=0.061	0.14
Understanding and analyzing emotions. MSCEIT	M=0.45 SD=0.048	M=0.43 SD=0.065	0.18
Emotion management. MSCEIT	M=0.34 SD=0.030	M=0.32 SD=0.040	0.05*
Total score. MSCEIT	M=0.39 SD=0.026	M=0.37 SD=0.046	0.02*
Interpersonal emotional intelligence. EmIn	M=46 SD=9.3	M=45 SD=7.3	0.61
Intrapersonal emotional intelligence. EmIn	M=46 SD=7.7	M=42 SD=9.0	0.03*
Interpersonal understanding of emotions. EmIn	M=31 SD=6.0	M=31 SD=4.7	0.52
Interpersonal management of emotions. EmIn	M=21 SD=4.0	M=21 SD=3.8	0.84
Intrapersonal understanding of emotions. EmIn	M=17 SD=4.3	M=16 SD=4.5	0.26
Intrapersonal management of emotions. EmIn	M=15 SD=3.1	M=14 SD=3.5	0.13
Expression control. EmIn	M=10 SD=2.5	M=8 SD=3.3	0.01**
Understanding of emotions. EmIn	M=48 SD=9.0	M=46 SD=7.7	0.31
Emotion management. EmIn	M=46 SD=6.1	M=43 SD=7.3	0.05*
Tolerance for uncertainty	M=60 SD=9.5	M=62 SD=10.0	0.30
In tolerance for uncertainty	M=62 SD=10.4	M=61 SD=10.2	0.72
Interpersonal intolerance for uncertainty	M=33 SD=6.4	M=33 SD=8.3	0.81
Empathic fantasy	M=21 SD=6.0	M=23 SD=4.6	0.19
Empathic distress	M=14 SD=2.7	M=15 SD=4.9	0.23
Empathic care	M=17 SD=3.9	M=17 SD=5.7	0.96
Decentralization	M=21 SD=3.3	M=19 SD=4.6	0.05*

Acting managers on average receive a higher score on the scales of identification of emotions ($p<0.06$), management of emotions ($p<0.05$), as well as on the scale of the overall score on the test of emotional intelligence MSCEIT ($p<0.05$). From the scales of EmIn questionnaire, the average rate of managers is higher than that of the control group on the scales of intrapersonal emotional intelligence ($p<0.05$), emotion management ($p<0.05$) and expression control ($p<0.01$). The only difference in terms of empathy between the groups was a higher score on the decentralization scale among managers compared to the control group.

The differences by gender and experimental groups in the preference for winning decks for the five IGT series are shown in figure 1.

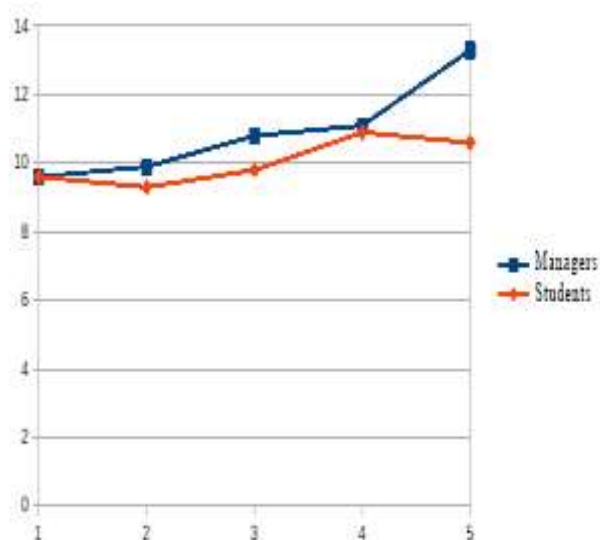


Figure 1. The differences between groups of students and managers in the preference for the winning decks in five series.

The intergroup differences in the preference for winning decks for the five IGT series are presented in table 2.

Table 2. The intergroup differences in the preference for winning decks for the five IGT series.

	Average values, Managers	Average values, Students	Significance of differences on the T – criterion
The preference for winning decks in the first series	M=9.6 SD=3.5	M=9.7 SD=3.3	0.97
The preference for winning decks in the second series	M=10.0 SD=3.8	M=9.3 SD=3.7	0.50
The preference for winning decks in the third series	M=10.8 SD=4.6	M=9.7 SD=4.5	0.38
The preference for winning decks in the fourth series	M=11.1 SD=4.0	M=10.8 SD=4.8	0.82
The preference for winning decks in the fifth series	M=13.3 SD=3.7	M=10.7 SD=4.9	0.02*

The positive correlation of intolerance for uncertainty with total change of decks after a loss under Iowa Gambling task (0,282; $p < 0.05$) was revealed. People who seek certainty and clarity perceive loss very unambiguously and try to avoid the risk of such an outcome in the future.

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3. Research results

The positive correlation between emotional intelligence measured by the MSCEIT test and the age of the subjects was established, which corresponds to the idea that the abilities that make up emotional intelligence develop with age [9]. However, in the course of the test examination, the correlation between the age and MSCEIT test scales was somewhat different – young people aged from 17 to 22 years received an average higher score on the emotion identification scale, but the overall score was the highest in the group aged from 25 to 30 years, while the group aged from 30 to 35 years had the lowest score [9]. The reason for the differences in the results could be based on the characteristics of

the professional activity of the subjects, and the fact that the average age of the test group managers in our study was much higher than 35 years.

We have found that managers on average gain a higher overall score of emotional intelligence on the MSCEIT test than the control group. This fact can be interpreted not only as a result of professional development, but also as the reason why these people occupy their positions. A higher average indicator of intrapersonal emotional intelligence, emotion management, and expression control according to EmIn questionnaire in managers also indicates to a high capacity for emotional self-control, less expressed in students due to age or lack of extensive experience of interpersonal interaction with subordinates.

Also, the significant differences in the preference for winning decks both by gender and depending on whether the subject belongs to the control group or to the group of managers were discovered. With each series, the differences in the preference for winning decks between men and women increase – men are more likely to choose winning decks. The group of managers also starts to prefer the winning decks with a higher probability than students, but the differences do not exist on the penultimate of the series and are the most significant on the last, thus, people with no managerial experience go back to less advantageous decks in the last moves, despite the fact that previously they were able to determine the winning deck with the same success as leaders. This result can indicate both to a lower degree of self-control in people with no managerial experience and a greater risk propensity due to the fact that their decisions in everyday life usually entail less responsibility than management decisions of leaders. Thus, the ability to understand and regulate emotions is important in the choice of solutions; therefore, emotional intelligence plays an important role in decision-making.

Managers also have on average a higher score on the scale of decentralization; they predict the behavior and reactions of other people easier. According to M. Davis, this indicator is the most important for the successful social functioning and self-esteem [6].

4. Conclusions

Acting managers have, on average, a higher emotional intelligence than people who do not have management experience, both in the test method of measuring emotional intelligence, and in the method based on self-reporting, which is presumably the consequence of professional development.

We have obtained results indicating to the inclusion of tolerance for uncertainty into the decision-making process. The role of tolerance for uncertainty was expressed in sensitivity to losses in the framework of Iowa Gambling Task: the desire for clarity and unambiguity is associated with a tendency to “avoiding” behavior, and strong emotional experience of failure.

References

- [1] Rodionova E V and Rida A N 2018 Peculiarities of agro-industrial complex enterprises as objects of strategic management *J. Sci.-met. el. “Concept”* **01**
- [2] Kovaleva O A 2013 Manager’s coping with stress in the workplace *J. Vestnik of KSU named after N.A. Nekrasov* **19**
- [3] Tikhomirov O K 1976 *Decision-making as a Psychological Problem* (Moscow: Nauka) pp 77-82
- [4] Manichev S A and Smolko S A 2015 Emotional components of rational and intuitive style of thinking when making management decisions *Bulletin of Saint Petersburg University, Series 12 Psychology. Sociology. Pedagogy* pp 38-50
- [5] Kornilova T V 2011 Dynamic functioning of intellectual and personal potential of a person in psychological regulation of decisions and choices *Bulletin of Moscow University. Series 14 Psychology* **1** 66–79
- [6] Karyagina T D, Budagovskaya N A and Dubrovskaya S V 2013 Adaptation of multi-factor questionnaire of empathy by M. Davis *Counseling psychology and psychotherapy* **1** 202–27
- [7] Seleznev V N and Klimova E M 2013 Emotions as a factor of psychological stability of managers in decision-making *Bulletin of the Moscow state regional University. Series Psy.*

- Sci.* **4** 53–61
- [8] Lucin D V and Ushakov D V 2004 Modern concepts of emotional intelligence *Social intelligence: theory, measurement, research* 29-36
 - [9] Sergienko E A and Vetrova I I 2010 Test of J. Mayer, P. Salovey and D. Caruso *Emotional intelligence MSCEITv. 2.0. Manual* (Institute of psychology RAS)
 - [10] Kornilov S A, Krasnov E V, Kornilova T V and Chumakova M A 2015 Individual differences in Performance on Iowa Gambling Task are Predicted by Tolerance and Intolerance for Uncertainty *EAP Cog. Sci. (Torino, Italy, September)* vol 1419 pp 728-31
 - [11] Kornilova T V 2010 New questionnaire of tolerance for uncertainty *J. Psy.* **31 (1)** 74-86