



SCIENTIFIC RESEARCH OF THE SCO COUNTRIES: SYNERGY AND INTEGRATION

上合组织国家的科学研究：协同和一体化

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这些会议文结合了会议的材料 – 研究论文和科学工作者的论文报告。它考察了职业化人格的技术和社会学问题。一些文章涉及人格职业化研究问题的理论和方法论方法和原则。

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俄罗斯养老金制度模式的现代转型
**MODERN TRANSFORMATION OF THE PENSION SYSTEM
MODEL IN RUSSIA**

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抽象的。文章通过对现有养老金模式与2024年实施模式的比较，对俄罗斯养老金模式的转型进行评估。通过分析养老金市场统计数据和监管创新，提出俄罗斯养老金制度完善的方向。

关键词：养老金制度、基金养老金、非国家养老金、保险缴款、养老金缴款、共同融资、社会税收扣除。

Abstract. *The article evaluates the transformation of the Russian pension model based on a comparison of the existing one and the model being implemented in 2024. Analyzing the statistics of the pension market and innovations in its regulation, the author suggests directions for improving the Russian pension system.*

Keywords: *Pension system, funded pension, non-state pension, insurance contribution, pension contribution, co-financing, social tax deductions.*

The beginning of the reform of the Russian pension system on the basis of existing global trends should be considered the years 2002 - 2004, when the funded component of the labor pension was introduced, in contrast to the previous model of the pension system - solidary, based on the principle of solidarity of generations, when working citizens provided pension payments to pensioners. This was due not only to the demographic situation, since the life expectancy of pensioners increased and the birth rate began to fall, but also to the need to reduce state obligations to pay pensions to citizens, as well as the need to abandon the equalizing nature of the state pension.

The pension system created in Russia consisted of three levels (three subsystems): the state pension system; compulsory pension insurance, which includes: the basic part, the insurance part and the funded (mandatory) part, as well as non-state (voluntary) pension systems. The systems of compulsory pension insurance and compulsory pension savings constitute the system of state compulsory pension insurance (CPI).

The funded pension was part of compulsory pension insurance and was based on contractual relations with non-state pension funds (NPFs) in the same way as the voluntary pension, which was implemented in the non-state pension provision (NPP) segment. Thus, Russian citizens had the right to state pension provision by law and by contract if they formed a funded pension in the compulsory pension insurance system, and to additional non-state pension provision by contract (at their own request).

The source of the funded pension was part of the insurance contribution (6% of the total amount, equal to 22%), and the source of the non-state pension was the pension contribution, the amount of which was set by the citizen himself. The totality of insurance contributions for the formation of a funded pension, transferred to the NPF and the state management company (Vnesheconombank - VEB.RF) form pension savings, and the totality of pension contributions - pension reserves.

Until recently, pension savings of citizens grew at a fairly rapid pace due to the growing interest of citizens in independent savings, as well as due to the transition of citizens from the State Management Company to private non-state pension funds. However, in 2014, government authorities decided to declare a moratorium on the transfer of part of the insurance contribution that forms the funded pension, and to direct these contributions to the payment of state pensions by citizens. This changed the structure of the pension system, which again became solidary.

Graph in Fig. 1 reflects the growth of pension savings and pension reserves for the period from 2004 to 2022, and shows a fairly rapid increase in pension savings.

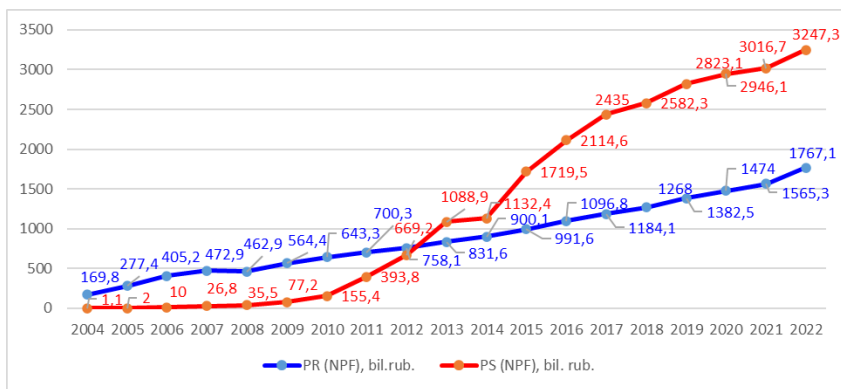


Figure 1. Dynamics of pension savings and pension reserves in Russian non-state pension funds [3]

Despite the moratorium announced in 2014, the growth of pension savings, which from that moment was carried out only through investment income received

from managing portfolios of pension savings in non-state pension funds, continued at a rapid pace. This indicates a fairly high efficiency of the existing model of the pension system.

We draw attention to this fact, which is important because in the world pension funds are an investment resource for the economy, and in addition, “the arrival of pension money on the market contributes to the growth of capitalization of issuers, reducing the volatility of stock prices, and improving corporate governance practices. However, it can also generate increased market volatility and a drop in prices in the event of a sudden outflow of pension funds’ investments” [1, p. 37], i.e. The importance of “long money” for the economy can hardly be overestimated.

Let us note that in the described model the emphasis was placed on the development of pension savings; they are the main source of “long-term money”, as indicated by the following signs:

1) Pension savings are (as the graph in Fig. 1 shows) a fast-growing resource of the Russian economy, since even under the conditions of a moratorium on the transfer of part of the insurance contribution for the formation of a funded pension (amounting to about 500 billion rubles per year) and restrictions on the influx of citizens into this segment (according to Russian legislation, since 2016, only young citizens starting their working career can choose the function of forming a funded pension), we are observing an increase in the volume of pension savings due to income from investing in the domestic stock market;

2) The source of pension savings is an insurance contribution, which is required to be transferred to the budget of the Social Fund of Russia (SFR), and the amount of the contribution is established by law, i.e. it generates predictable cash flow, which is important for the formation of long-term investment resources;

3) Spending of pension savings is strictly regulated: payment of pensions (started in full in 2022, when women born in 1967 began to receive pensions); payment of funds to heirs in cases specified by law; payment for trust management services for pension savings, etc.), which prevents an unpredictable outflow of funds from the total volume of investment resources;

4) Investment of pension savings is strictly regulated by a number of Federal laws and regulations (Federal Law “On Non-State Pension Funds”, Instructions of the Bank of Russia “On the requirements for organizing a risk management system for a non-state pension fund”, “On the requirements for the formation of the composition and structure of pension reserves” and etc.) in order to comply with the risk/return indicator and the requirement to reflect the break-even of investments in a portfolio of securities over a time horizon of 5 years;

Currently, a more serious transformation of the Russian pension system is taking place - the replacement of the existing model with a new one, in which the funded pension will remain only for those citizens who formed it before 2014. The

main emphasis in the new model, which will begin to operate in 2024, is on the development of non-state pensions.

To increase the attractiveness of the segment of formation of non-state pensions, it was stated that the sources of their formation will be:

- pension contribution;
- income from the placement of pension reserves on the stock market;
- pension savings of a citizen accumulated in a non-state pension fund or the State Management Company (VEB.RF);
- co-financing of an additional pension contribution (the maximum amount transferred to a citizen's individual account by the state is 36 thousand rubles, the program is valid for 3 years).

In addition, preferences are being introduced for citizens who form a non-state pension, such as:

- 1) tax deductions for the amount of pension contributions and contributions for co-financing (the total cumulative amount of all deductions for various reasons, including for training, treatment, etc. is no more than 120 thousand rubles);
- 2) the guaranteed amount of pension reserves per pension program participant is 2.8 million rubles;
- 3) there is an opportunity to receive accumulated funds in the event of "special life circumstances", for example, for expensive treatment.

Despite the attractiveness of the introduced conditions for non-state pensions, they cannot be considered an absolute innovation, since in the previous model, which stimulated the formation of a funded pension, similar preferences existed for citizens:

- co-financing of pension savings; entry into the program from 2008 to 2014, contribution from 2 to 12 thousand rubles. doubled by the state (max 24 thousand rubles per year) for 10 years (valid until 2025);
- no taxation;
- guarantee amount 1.4 million rubles;
- social tax deduction for the amount of co-financing contribution.

In this regard, some rating agencies (NRA, ACRA) believe [2] that the maximum number of citizens who will transfer their pension savings to the category of pension reserves for the purpose of forming a non-state pension will be no more than 10% of the economically active population of Russia.

In our opinion, the possible results of the new pension reform could be the following events in the Russian economy:

1) Investment resources ("long-term money") will decrease in the long term due to an increase in the number of pensioners entitled to receive a funded pension when men born in 1967 and younger begin to retire (from 2027);

2) We can hardly predict the influx of funds (the amount of the pension contribution) and citizens into the NGO system, in particular, due to the limited circle of

people who will be able to take advantage of the maximum benefits for co-financing and social tax deductions, since to receive max co-financing within 3 years and maximum tax deduction, a citizen must make a monthly pension contribution in the amount of:

3,000 rub. + 33,333 rub. = 36,333 rub. throughout your working life,
which is a very significant expense (more than 55%), based on the average nominal accrued wages of Russian citizens, amounting to 65,338 rubles for 2022. (\$707 at the exchange rate as of November 8, 2023) [4];

3) Regulatory problems, from our point of view, are:

a) withdrawal of pension funds “for urgent needs” under Russian law does not imply the return of these funds before retirement age to receive a non-state pension, as in Western legislation, which will lead to an outflow of pension funds from the economy;

b) Russian legislation does not provide for stimulation of the development of corporate pension systems, as evidenced by the existence of such a rule as taxation of corporate pensions. In addition, foreign countries have introduced a mechanism for “quasi-voluntary” involvement of citizens in the corporate pension system, which is not provided in Russia.

Based on the above, we consider it necessary to continue improving the pension system, leaving both options for funded pensions - an insurance (compulsory) funded pension in the compulsory pension insurance system (CPI) and a voluntary (non-state) funded pension without the flow of pension funds from one system to another. We propose to improve the pension system in the mandatory pension insurance segment in the following directions:

- lifting the moratorium on the transfer of part of the insurance premium for the formation of an insurance funded pension to increase the influx of investment into the economy;

- introduction of models for the transition to a multi-product strategy for the formation of portfolios of pension savings to reduce risks and increase the profitability of pension savings.

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金融市场从传统组织到算法组织
**FROM TRADITIONAL TO ALGORITHMIC ORGANIZATION OF
THE FINANCIAL MARKET**

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抽象的。 本文对与金融市场行为的组织和解释相关的主要理论原理进行了演化分析，以及市场组织计算原理出现的条件。 在分析金融市场主要分析方法和
技术变革的基础上，提出为后续金融市场算法-计算变革的研究开辟新的研究空
间。 文章提出了一种分析金融市场转型的特殊方法。 为此，我们在技术、制度变
迁和进化原则之间建立了联系。 借助新的设计，我们审视了现代金融市场，并概
述了其变革的前景。

关键词： 金融市场、建模、生成模型、有效金融市场、行为金融学、适应性市
场、市场自组织

研究理念： 金融市场→市场的概念论证→市场组织的算法基础→建模→生成
模型→应用前景。

Abstract. *This article presents an evolutionary analysis of the main theoretical principles related to the organization and explanation of the behavior of the financial market, as well as the conditions for the emergence of the computational principles of market organization. Based on the analysis of the transformation of the main approaches to the analysis of the financial market and technological changes, it is proposed to open a new research space for the subsequent study of algorithmic-computational transformations of the financial market. The article proposes a special approach to analyzing the transformation of the financial market. To do this, a connection was made between technology, institutional changes, and the evolutionary principle. With the help of a new design, the modern financial market is examined and prospects for its change are outlined.*

Keywords: *financial market, modeling, generative models, efficient financial market, behavioral finance, adaptive market, market self-organization*

Research concept: *Financial market → conceptual justification of the market → algorithmic basis for market organization → modeling → generative models → application prospects.*

1. Introduction

Financial markets occupy key positions in resource allocation and price determination. They play an important role in discovering information that determines the movement of the real economy.

There is an extensive literature that analyzes prices, the flow of information and the behavior of participants in financial markets, but much less attention is paid to the economics of the markets themselves and the conditions for establishing order in the market. At the same time, the effectiveness of financial activity and the possibility of its impact on economic transformations largely depend on the market order.

A better understanding of the functioning of the financial market requires knowledge of the basics of its organization and an understanding of the mechanism responsible for the order. This article presents four main theories and hypotheses of the organization of financial markets, which explain the behavior of the market and their participants: spontaneous organization, efficient market, behavioral market, adaptive market. Taking these theories into account, the question is raised about the conditions for the transition to an algorithmic organization of trade relations and an algorithmic structure of the financial market. The article uses an evolutionary approach to analyze the theoretical justifications of market development and transformation of market practice.

2. Basic concepts and mechanisms of financial market organization

Recently, important changes have been occurring in financial markets. Among them, the following stand out: a significant reduction in transaction costs, an increase in market turnover and entry into the market of non-specialists. These processes are largely driven by the transition to new trading technologies and computing procedures. The transition to big data technologies using artificial intelligence (AI) is changing traditional ideas about market organization, behavioral procedures, and the attitude towards market equilibrium as the basis of market order and market efficiency.

The further evolution of the financial market depends not only on its current state, but also on previous processes. Markets have “long-term memory.” The dynamic features of the financial process can be traced when analyzing the evolution of conceptual approaches.

Over the last century, several theoretical justifications for the organization of the market and models of its functioning and behavior have been proposed. Among them, the main ones are the following four theoretical constructs.

The spontaneous organization of the market is a system-forming concept of the socio-economic theory of market order, proposed by Friedrich von Hayek. With the modern understanding of this theory, all market movements are distributed between chaos and order. The task of the market comes down to streamlining

the structure and behavior of agents. The tool by which ordering occurs is the “invisible hand of the market” proposed by Adam Smith. The driving force behind the order is market mechanisms and price signals.

The efficiency of the financial market is ensured by minimizing transaction costs, complete information support, reflection in the price of all available information and rational behavior of all participants. In the last third of the last century, it was discovered that the concept of rational expectations leads to outcomes that are systematically different from what market participants expect them to be. This provision casts doubt on the very idea of an efficient market as a condition for its functioning. Moreover, internal market logic cannot provide the basis for full market efficiency (Grossman-Stiglitz paradox). Nevertheless, regulators have long approached financial markets as efficient, rational agents. In this case, any deviations were considered anomalies that were corrected by government regulation, including bank bailout programs that became especially popular during the 2008 financial crisis.

The behavioral financial market as a new financial paradigm became popular towards the end of the last century. Behavioral finance emerged in the last third of the last century and was associated with prospect theory by Daniel Kahneman and Amos Tversky, who, drawing on cognitive psychology, showed that a set of psychological factors determines the individual expectations of market agents. This theory attempted to reflect real market conditions in which the level of rationality and irrationality of agents varies depending on different circumstances. Considering the new approach, new market mechanisms and principles governing them have emerged. Behavioral surveillance has emerged as a way for the state to quickly respond not only to the behavior of end consumers, but also to current market fluctuations.

The adaptive market as a way to optimize rational mechanisms with irrational behavior of market participants was proposed by Andrew Lo in the last decade. In this hypothesis, an attempt was made to bring the theoretical explanation of the market even closer to its real state. As a result, the flexibility and accuracy of theoretical constructs that explain the market have been increased.

The proposed formal models offer several results that can be used to characterize the equilibrium state of the market structure in different ways. All the models considered are based on the principle of market self-organization, which was probably presented in the most general form by Hayek [1]. Empirical analysis of financial time series allowed us to confirm this principle [2]. At the same time, the self-organization of the market is based on the discovery of information and price “connections” based on the price discovery mechanism [3]. The price effect of communication is of great importance for ensuring market equilibrium and economic efficiency, as well as the unification of market participants.

John Maynard Keynes did not deny the value of the very idea of self-organization of the market but introduced the provision of government regulation as a way of maintaining market equilibrium. His followers believe that the mechanism proposed by Keynes eliminates market anomalies and maintains equilibrium in extreme circumstances.

More than half a century ago there was a desire to find a middle ground between the free development of the market and its regulation. A certain contribution to the development of the position on the synthesis of two principles - the market and the state - was made by Paul Samuelson (neoclassical synthesis). However, these studies were never logically completed.

New hypotheses that explained the irrational behavior of market participants and the possibility of the emergence of financial “bubbles” rose to the forefront of economic research. Among them, Hyman Minsky’s hypothesis of financial instability stands out, which explained the possibility of financial crises and their completion. In modern literature, they usually pay attention to the first half of the position postulated by Minsky - an explanation of the causes of crises and leave aside the second part - the conditions for completion, which, in our opinion, also follow from his hypothesis.

The most important conclusion that follows from their Minsky hypothesis is the following: there is no tendency towards a general economic and financial equilibrium state of the capitalist market. Empirical and theoretical analysis by many researchers has shown that there are regulatory implications for both eliminating market failures and maintaining market equilibrium. Most importantly, the financial market is subject to extensive legal and regulatory restrictions. This provision applies to both national markets and the global financial market. Through legal and regulatory restrictions, they are trying to overcome what is inherently insurmountable - uncertainty and market instability.

According to Minsky, this market feature has two sides: on the one hand, it acts as a threat to the stability and development of the market and the system, on the other hand, it opens up space for activity, including innovation, and the realization of individual and social freedom. Thus, uncertainty is a guarantor of development. Therefore, it should be used by new organizational structures as a driving force for development.

Modern algorithmic approaches are the latest attempts to practically operate market processes, which are based on constant fluctuations from certainty to uncertainty and back. This attempt could have huge consequences for the future of the market and the entire social system, since it involves a new mechanism for manipulating information and financial processes. In the future, changes in the entire market structure and the financial intermediation system are possible. New algorithmic-computational models are capable of influencing development at three levels: social-public, market-organizational, trade-technological.

3. Algorithmically calculated market structures

Over the long history of the development of human society, many different social and market mechanisms have been created [4]. They have been the subject of numerous studies in fields ranging from sociology, anthropology and ecology to finance, economics, and political economy. Currently, various options for constructing an artificial algorithmically calculated financial market are being developed. The strengthening of these trends can be considered as a kind of technological-institutional transition in the organizational market structures themselves in response to the growth of information and financial knowledge, as well as the development of new technologies.

The existing techno-economic and institutional elements at the previous stages of financial market development were formed by socio-cultural structures. Currently, the driving forces behind their formation are technological innovations, as well as new opportunities based on the combination of natural intelligence and artificial intelligence. The direction of these changes is determined by the tasks of increasing the efficiency of the market device and organizing its work.

The modern model of the financial market with the process of social perception of both its legitimate and everyday foundations (perception) [5] and technologies ensures the dissemination of information for various methods of trading. It is a platform for the development of new market technologies and algorithms.

A new area of research is currently emerging; It is at the intersection of AI interaction with traditional trading structures. A new generation of generative AI models offers interactive capabilities for human-computer interaction. It opens the door to new trading procedures and market organizations based on a symbiosis of natural and AI. The possibilities and disadvantages of innovations must be analyzed, understood, and correctly used on the farm.

Any market operates according to formal rules or algorithms that are established during its self-organization [6]. Financial and information specialists began to isolate these algorithms and formalize them. As a result, taxonomies and ontologies of market processes have been developed. The next step was to connect artificial intelligence to them, which made it possible to move on to their use in automated trading operations.

Generative adversarial networks (GANs) were introduced by Ian Goodfellow in 2014. They are based on a zero-sum minimax game for two network participants - a generator and a discriminator, in which the relationships are built in accordance with game theory using deep neural networks. During the short period of existence of the new technology, several variants of generative adversarial networks have been developed. They are widely used both for studying market behavior and consultations through user recommendation systems, as well as for predicting prices and organizing trade [7].

Recently, there has been an accelerated development of artificial intelligence. Significant breakthroughs in this area have been achieved using natural language processing technologies. These technologies are used in chatbots that are used for financial advice.

In 2022, OpenAI developed ChatGPT, designed to engage in natural language conversations. The new model shows that the language and text modulator can be extended [8]. This technology can change the way a person interacts with a computer, making it more accessible by connecting artificial intuition and self-learning. It is quite possible that soon it will also be used in trading operations and portfolio management.

The prospect of automated trading systems based on generative technologies that manipulate information is quite problematic. Such systems can slow down, speed up and reduce the cost of financial communications, as well as create additional problems. Automated systems can distort information and social values, which can destabilize public institutions [9].

When studying the relationship between the theoretical understanding of the financial market, the emergence of structures and reality, attention is focused on creating models of the constructive mechanism or the technology of its self-realization. Generative AI models are currently at the forefront of such technologies.

4. Conclusion

The macro perspective between techno-economic elements and socio-cultural structures is one of the defining connections in institutional economics. Financial market analysis with data positions. Allows you to clarify and study current trends in innovation and the constant development of basic conceptual approaches to the financial market.

Evolutionary analysis leads to an assessment of new drivers for the development of both theories and practices of the financial market, among which there are enormous prospects that lie in AI and connect them with certain task structures. New algorithmic solutions that create generative models change market processes and the behavior of market participants. However, the prospects for change are not clear. On the one hand, there are changes that affect the improvement of market efficiency and sustainability. On the other hand, serious threat opportunities arise that open new financial applications for manipulating the market and agent behavior.

With the noted more important condition for the main theme of this article is to propose a structure and a special connection to establish the connection between technologies, institutional structures, and the evolutionary principle in the analysis of the financial market and its prospects.

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国有公司的投资管理系统, 以增加组织在不稳定条件下的业务活动
**INVESTMENT MANAGEMENT SYSTEM OF STATE
CORPORATIONS TO INCREASE THE BUSINESS ACTIVITY OF
ORGANIZATIONS IN CONDITIONS OF INSTABILITY**

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注解。 本文探讨了各种类型的项目管理方法的变化。 现有模型在管理决策方面的缺点已经被发现。 分析了在不确定条件下做出投资决策以增加国有企业业务活动的方法。 已经确定了分析国外经济能源项目资源流动的工具和机制。 开发了一个用于管理投资项目的原始系统, 强调将模拟和模拟建模与能源项目的多标准因素相结合。

关键词: 系统、项目管理、风险和不确定性、各类国有企业项目。

Annotation. *The article explores variations in project management methodologies of various types. The shortcomings of existing models in terms of making management decisions have been identified. Methods for making investment decisions under conditions of uncertainty to increase the business activity of state corporations are analyzed. Tools and mechanisms for analyzing resource flows in foreign economic energy projects have been defined. An original system for managing investment projects has been developed, emphasizing the combinatory of simulation and analogue modeling with multi-criteria factors for energy projects.*

Keywords: *system, project management, risks and uncertainty, projects of various types of state corporations.*

Introduction: In modern conditions of complexity and variety of tasks performed, the problem of modeling the management of investment projects is being updated. Project management is considered as a set of mechanisms and tools that determine requirements in the field of planning and resource supply. Project management modeling is defined as a set of principles: validity, consistency, complexity. The developed models are used in project management of state corporations. However, standard methods are ineffective given the variability of current market conditions. The dynamism and multiplicity of tasks determines the need for com-

panies with state participation to adapt to new realities. Such trends prioritize the assessment of new parameters and the redistribution of priorities, which are a key requirement of a project management system.

Analysis of project management models: Research of problems, we started with Agile¹, which is an iterative-incremental control principle. This approach is focused on the dynamic formation of tasks with continuous interaction of elements. Each of the iteration is a separate link, which includes tasks and goals necessary for the functionality of the model. The study found that the characteristic benefits of agile are synergy² iterations of project management. This is possible through the introduction of changes at project control points and the redistribution of its resources.

Research has shown that agile has disadvantages. The most significant is dependence on the external environment. It eliminates decision-making aimed at assessing the unreliability of data by determining the threshold value³ influencing changes in decisions made. Other shortcomings are the lack of tools to influence the functioning of production and economic activities⁴project.

Energy projects must have forecasting tools⁵ maximum permissible deviations from the planned parameters. Such deviations exclude the possibility of adjusting parameters at levels⁶ decision making. Their task is to identify problems and systematize solutions, with limited development boundaries. Limiting the boundaries of making such decisions is reflected in costs that distort the integrity of the organizational management structure⁷ project, although it is worth taking into account that the main driver for the development of management systems is the validity of integration and achieving a synergy effect in making management and investment decisions.

Analysis of methods for making investment decisions under conditions of uncertainty: The study of investment decisions in energy projects is based on the use of formalized and informal methods⁸. The degree of their combination depends on external and internal factors. The basis for making decisions of an investment nature is the assessment and comparison of the volume of capital in-

¹ Agile is a term for methods and practices based on the Agile Management Methodology Manifesto.

² Synergy is the enhancing effect of the interaction of two or more factors.

³ Threshold is a quantitative expression of the sensitivity of the project.

⁴ Production and economic activities are aimed at managing the project's work cycles, its production activity and manufacturability.

⁵ Forecasting tools - scenario method, mathematical modeling, analogy method.

⁶ Levels of management decision making - a method of analysis that allows you to make informed and holistic decisions.

⁷ The organizational management structure is a set of connections between the project management subsystems.

⁸ Formalized and informal methods are a set of methods of economic analysis.

vestments and future financial income. The use of formalized criteria is based on a comparison of the amount of investment to profitability. There is also a subjective side to it, expressed depending on the reliability of the indicators. The results of the study showed that informal approaches do not emphasize the completeness of data verification. The above determines the need to develop an investment decision-making tool that takes into account not only the pace of project implementation, but also the criteria for control over its resource flows.

To solve the problems of the above tools, the method of mathematical modeling is used⁹. This approach describes a process with the flexibility of varying control system parameters. The principle of its operation is based on multi-criteria simulation of the process under consideration, and the task is on analyzing the influence of environmental factors on investment projects of various types. The advantage of this tool is that it is the only solution to multi-criteria problems, since analytical tools are used for small projects. The disadvantage of the tool is the amount of time spent on its creation, the lack of criteria and parameters for data verification, which excludes management of the external environment. Although such a tool distributes the parameters of the external environment of the project, it is not effective to manage it in the absence of a ranking function. Ranking of the external environment makes it possible to predict investment decisions by classifying environmental factors according to the level of their influence. This approach will allow you to set precise parameters, minimizing the distortion of its results by risk and uncertainty.

Making investment decisions under risk conditions¹⁰ implies the choice of an option in a situation where each decision made leads to one of the particular outcomes. Making decisions under conditions of uncertainty¹¹ means choosing a development path in which actions have multiple results. When making decisions in such conditions, it is necessary to assess its degree. This indicator is characterized by a subjective assessment of the maximum or minimum return on investment. Moreover, the higher the range between these values is, the greater the degree of uncertainty.

It is worth noting that investment decisions made under risk conditions differ in how they measure the probability of loss. Risk magnitude indicator¹², is a weighted average applicable to all probable events, where their outcome will be used as the frequency measurement of the average outcome.

⁹ Mathematical modeling is the replacement of an object with its conditional image, which describes the mechanisms for making investment decisions.

¹⁰ Risk is a circumstance that causes a favorable or negative effect on the control object.

¹¹ Uncertainty is the incompleteness of information in which the project is being implemented.

¹² Risk magnitude is an indicator that combines the likelihood of a risk occurring and its consequences.

Risk analytics is divided into two types - this is qualitative¹³ and quantitative¹⁴. These risk and uncertainty analysis tools make it possible to identify, qualify and identify problems in project management. The study of risk management tools revealed the impossibility of obtaining reliable information about the situational context¹⁵ analyzed project. Existing tools are not applicable in dynamics, since it is impossible to provide an energy project with the completeness and objectivity of the data obtained.

The conducted research revealed that in energy projects there is a peculiarity of management decisions under risk conditions¹⁶. Analysis of the decisions made revealed that their advantage lies in the ability to determine factors that require consideration when making investment decisions. The disadvantage of this method is the lack of predictability of capital productivity. To determine more accurate predictability parameters, additional assessment tools are required¹⁷ environmental factors¹⁸ project. Analysis of investment instruments made it possible to determine that in the case of using several project development strategies, the choice between them should be made on the basis of the development of a new additional current liquidity ratio. For example, for calculations it is possible to use root-mean-square deviations from the weighted average indices in each selected strategy. Based on the calculation results, it is necessary to develop an algorithm for implementing each project development scenario for the most capacious return from the investment reengineering carried out.

The author's research has shown that investment solutions have not been developed. There are problems of determining predictability indicators with the introduction of quantitative characteristics that reflect the industry specifics of the energy project. The need has been identified to develop an indicator of optimality for determining the level of risk, with the calculation of maximum deviations from the initial parameters. Its indicator must take into account all the risks of the project, taking into account the variable nature of the external environment. The study revealed that for an energy project, at the implementation and operation stage, it is necessary to develop and classify tools and indicators that emphasize the predictability of the project. The introduction of new indicators will allow stakeholders¹⁹ project to evaluate the prospects for development of management systems.

¹³ Qualitative risk analysis is a process aimed at identifying project risks.

¹⁴ Quantitative risk analysis is an analysis of the potential impact of identified risks on a project.

¹⁵ Situational context is a communicative feature for the accuracy of action interpretation.

¹⁶ Management decisions under risk conditions are a set of methods based on the theory of statistical decisions.

¹⁷ Tools for assessing the external environment are PESTLE analysis, M. Porter's 5 forces, SWOT analysis

¹⁸ The external environmental factors of a project are the conditions that influence its activities and results.

¹⁹ Stakeholder is a person or organization that has rights, interests, claims or interests in a system or its properties that satisfy their needs and expectations.

Balanced control system: The author has proposed an original system for managing investments of state corporations in projects of various types, based on the functionality of the integrated management approach. This allows you to monitor the progress of the project with continuous interaction of all subsystems at the decision-making level.

The developed method of making management decisions emphasizes the multi-criteria purposeful impact on the project subsystems. In practical applications, subsystem mechanisms include measurement analysis tools²⁰ratio of parameters of the direct impact environment²¹ with control points. Management decisions aimed at the combinatory of subsystems emphasize the functionality of the synchronized operation of mechanisms. The chosen approach is carried out by using analytical tools²²comparability of processes and work cycles that do not intersect during the implementation of the project. This will eliminate iteration, speeding up the commissioning of the project. To achieve the required level of system flexibility, it is necessary to develop an indicator for determining the degree of deviation of costs from the specified parameters.

The shortcomings of management decision-making methods prompted us to develop an indicator that displays indicators of the objectivity of management decisions by relating the value of the project's strategic indicators to the dynamics of operating activities. The indicator analyzes the organizational and economic parameters of the project using the absolute difference method²³. The chosen method includes: resource intensity, adjustability, controllability and process development. The author's indicator is defined as the ratio of the number of gaps in business processes to the volume of operating costs. The task of the indicator is to manage the internal environment, which will allow us to determine the correlation of the level of useful output in relation to the volume of required costs per unit of production. Based on the calculation result, the state corporation will be able to adjust the dynamics of managing the resource flows of the project.

The properties of energy project management determine the development of the SMS approach²⁴to making management decisions. The key property of the system approach is its non-addictiveness²⁵, which defines it as a holistic functional unit, allowing its sub-models to function in parallel. The SSS property is designed

²⁰ Measuring direct impact factors - using M. Porter's 5 forces method.

²¹ The direct impact environment is the factors that influence the operations of the project and are influenced by the organization (state corporation)

²² Management analysis - analysis of the functioning of the system in order to make optimal decisions using the comparison method and an integral approach.

²³ The absolute difference method is a method for calculating the influence of factors on the growth of a performance indicator.

²⁴ SSU - Balanced control system.

²⁵ Non-additivity is the property in which the whole cannot be decomposed.

to take into account: emergence²⁶, the massive nature of economic phenomena²⁷, and dynamism of management processes. Decision making in traditional management is based on the study of past experience of similar problems. This feature is taken into account in our system, in the composition of which new stages appear: related to the identification of analogues, their economic decomposition, and analysis of implementation stages with identification of impact and resistance factors²⁸. The fundamental difference of the proposed algorithm is the emphasis on du stagecoach²⁹ similar projects³⁰. This approach will allow us to predict the degree of impact of the external environment on the project.

The forecasting method proposed by the author is based on a tree of goals. This approach improves the existing methodology by identifying horizontal relationships between income and costs. Quantitative Metrics³¹ will contribute to the distribution of connections between forecasting elements and their impact on decision making. Based on the determination of forecasting indicators, SMS makes it possible to develop actions aimed at reengineering business processes³², ensuring the functioning of subsystems at all levels of its economic hierarchy.

As a tool for change management, the cyclic control method with KPI elements is used. Such combinatory reflects the adaptation metric by analyzing control efficiency. Change management tools are based on situational analysis³³. This will allow you to analyze the stages of the project, and if the deadlines shift, correct its deviations. The Honing's model was chosen as the main change management method³⁴. The basis of this model is the stage of diagnosing the problem and identifying resistances, which will give the subsystem flexibility, control over implementation and the ability to adjust with the ability to make changes in parallel.

To make decisions, the system takes into account quantitative indicators³⁵ analogues. Their application, the using analog modeling method³⁶ reflects the metric of the ratio of the volume of useful output and the costs of the project in comparison with analogues.

²⁶ Emergence is the principle that a system has properties that are not inherent in its individual subsystems.

²⁷ The mass nature of economic phenomena is a process that is modeled through mass observation.

²⁸ Resistance management method - Kotter and Schlesinger's 6-point method.

²⁹ Du stagecoach is a procedure for drawing up an objective idea of the object of analysis.

³⁰ The comparison method is a tool that allows you to measure the general and specific in projects.

³¹ Quantitative metrics - numerical data for analysis. These metrics include: budget and efficiency of business processes.

³² Business process reengineering is a radical restructuring of the system's work processes.

³³ Situational analysis is the implementation of a management decision, which is based on an analysis of the situation.

³⁴ The B. Hinings model is a model for managing organizational change, consisting of 5 steps.

³⁵ Quantitative indicators are indicators that reflect the magnitude, size, volume

³⁶ Analog modeling is modeling based on the analogy of processes and phenomena.

The obtained metrics will be further used in simulation modeling³⁷. The method developed by the author determines the degree of occurrence of scenarios by generating indices over time. When creating a model using the author's method, all uncertain factors are replaced by a range of values obtained as a result of analogue modeling. The indicators are determined by analyzing the probability distribution³⁸. To construct a scale, our approach uses the result of comparing statistical data with analogues in the dynamics of their implementation, which will enable energy projects to calculate parameters that grow to infinity, for example, the estimated price of electricity generation using a lognormal distribution³⁹, which will give the state corporation the necessary analytics for its strategic development.

The developed approach to simulation modeling will provide the system with the necessary algorithm for leveling uncertainty; this will allow focusing on the risk that has a mathematical probability of occurrence. To determine the likelihood of a risk occurring, the mechanism takes into account numerical statistical data. Such data, taken from the analysis of analogues and the results of simulations, is available through the interaction of the risk management model with the author's modeling tools. For example, the mean square indicators of deviations from the initial parameters for each risk factor can be taken into account. Additional control is possible with the introduction of an algorithm for classifying them according to the degree of correlation of the project against possible distortion of its parameters by the level of risk. Unlike existing risk ranking methods, I believe it is necessary to distribute it mathematically. To do this, it is necessary to develop and test a correlation coefficient that reflects the degree of risk relationship to its possible adjustment. The introduction of such a tool will enable the system to develop self-adapting functions using a mechanism for evaluating alternatives.

The assessment of an alternative strategy in the author's system depends on the scale of the investment project, and also takes into account the given payback period of the project and the volume of generated financial flows. At the same time, the functioning of the SCS will be most effective when using a modified method for selecting solutions based on the stability criterion⁴⁰. However, for a more comprehensive indicator, it is necessary to develop a mathematical model in which the average indicator will be affected by various coefficients. The coefficient indicators can be an index for evaluating alternatives in the form of a dominant binary, or an indicator for ranking external risk factors expressed in a numerical indicator.

³⁷ Simulation modeling is a research method by replacing a system with a model.

³⁸ The Gaussian-Laplace distribution is a continuous probability distribution with a peak at the center or symmetry at the sides.

³⁹ The lognormal distribution is a method for calculating parameters that do not take a negative value.

⁴⁰ The Hurwitz stability criterion is a way to analyze a dynamic system for stability.

This approach to making investment decisions will make it possible to verify the results of the management team's activities.

Conclusion: Thus, the new approach developed by the author to modeling project management with state participation in capital allows the mechanisms of a balanced system to function as an integral synergetic unit necessary for the implementation of energy projects under conditions of uncertainty and risk. The main objective of the developed system is the principle of comparability of proprietary indicators to existing management tools. The use of modeling methods using the author's method will allow for a comprehensive assessment of the influence of the external environment on the project with the designation of reference points at which the tools for assessing alternatives will allow for effective investment reengineering⁴¹ resource flows necessary for managing energy projects.

⁴¹ Investment reengineering - reformatting of project resource flows based on analysis of financial indicators.

城市政府与企业互动法律监管研究的前景预测：协同方法
**FORECASTING PROSPECTS FOR STUDYING THE LEGAL
REGULATION OF INTERACTIONS BETWEEN GOVERNMENT
AND BUSINESS IN MUNICIPALITIES: A SYNERGETIC
APPROACH**

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抽象的。现代经济在很大程度上取决于政府监管原则和企业激励态度对社会问题的关注程度，而这些社会问题取决于它们在这方面的相互作用。将一种经济结构转变为另一种经济结构的过程需要国家对企业与政府之间的互动产生最优控制影响。这种方法将使我们能够确定多极世界和信息技术中新一代经济的发展趋势。人们已经确定，信息不仅成为影响全球层面管理流程的因素，而且也成为影响人们日常生活、满足他们的利益和需求并形成自我意识的地方自治政府的管理流程的因素。

关键词：状态、预测分析、法律、经济、商业、协同、信息化。

Abstract. *The modern economy is largely determined by the extent to which the principles of government regulation and motivational attitudes of business will be focused on social problems that depend on their interaction in this matter. The process of transforming one economic structure into another requires the creation of optimal control influence on the part of the state on the interaction between business and government. This approach will allow us to identify trends in the development of a new generation economy in a multipolar world and information technology. It has been established that information becomes a factor influencing management processes not only at the global level, but also at local self-government, where people's daily lives take place, their interests and needs are satisfied, and self-awareness is formed.*

Keywords: *state, predictive analysis, law, economics, business, synergetics, informatization.*

An urgent problem of modern Russian reality is to determine the possibilities and boundaries of legal regulation of interaction between the economy and public authorities at the level of local government. In the context of informatization of public relations, new multifaceted processes make the previous type of management obsolete and ineffective, hindering the implementation of business interests. The local community is not always ready to completely abandon the bureaucratic model of economic management and move to new ways of regulating it that improve quality and efficiency. A number of projects to improve economic activity are at the initial stage of their development, since ways to solve both personnel and systemic problems of its modernization have not been found.

There is an opinion [4] according to which development is determined not only by linear, but also by nonlinear processes, their irreversibility is recognized, and a new vision of the future appears through “turbulence,” “bifurcations,” and “fluctuations,” which are the basis of the vision of the modern world. In modern science, two mechanisms are recognized as the basis for the dynamics of processes and phenomena: “static, creating order from disorder” and “dynamic, producing order from order,” ensuring the stability of order.

State organization is traditionally built on the basis of natural laws and customary law, in contrast, state power, as its basis, establishes a system of law and a system of legislation capable of innovation and risk. Political activity by its nature has always been risky, since justified risk is a condition for ensuring the sustainability of public policy. In the process of reforming public administration, risk provides a new level of its strategies and tactics, goals and objectives in the context of the need to transform social relations.

The potential of local self-government in combination with public authorities and civil society “makes it possible to implement the initiatives of the population and strengthen the measure of their responsibility for the stable socio-economic development of the territories.” [1] Consequently, existing programs of state assistance to local self-government should be focused on overcoming bureaucracy in the local government system, reducing the costs of its excessive regulation, on the one hand, and, on the other, achieving a balance between public authorities and civil society institutions. In this regard, the analysis of complex and dynamic changes occurring during the transition to a new type of society based on information technology and informatization of social relations becomes relevant.

One of the priority sources for obtaining legal information is information and telecommunication technologies, which influence the formation of legal consciousness and legal culture, which poses new research tasks for the theory of state and law. Informatization and universalization of public and personal life leads to a weakening of national and cultural traditions; society is losing the old system of values that held social ties together. In turn, modernization can lead not only to

positive, but also negative consequences and results, both for the individual and society as a whole. In the process of forming legal consciousness and legal culture, the unification of an individual's personal characteristics occurs, his individuality is lost, therefore there is a need to build new forms of existence at the level of local government, where people's daily lives take place and vital needs are met. The municipal community is able to limit the dominance of global values and universal interests; it strives to preserve its identity by bringing management as close as possible to solving problems in the conditions of the fullest expression of the interests and needs of the population of the municipality.

To determine specific directions of legal policy in the sphere of regulation of public relations in the information society, it is necessary to study the influence of legislation on them in the conditions of Westernization and information wars. Legal reality is reflected in the social and individual consciousness of a person who, voluntarily or involuntarily, is guided by moral, religious, political and other criteria offered by the media, which sets guidelines for modern society. The process of informatization is irreversible; it develops at a faster rate than a person can rethink it, which becomes one of the reasons for the formation of a new legal consciousness that corresponds to the contemporary ideology.

With the transition to an information society, along with traditional factors affecting the legal consciousness of the population of municipalities, new ones appear related to the rapid development of modern technologies, which, in the context of the popularization of multiculturalism, can destroy a person's self-identity and give rise to ideas of legal nihilism. In the information society, factors influencing the formation of legal consciousness include: interpersonal communication, legal education, which are transferred to the virtual space or duplicated on the Internet, which significantly enhances their influence on social connections and processes.

Information becomes a factor influencing management processes not only at the global level, but also at local self-government, where people's daily lives take place, their interests and needs are satisfied, and self-awareness is formed. Currently, traditional regulators of social relations, such as morality, religion, art, are losing their impact, fading into the background, being replaced by legal consciousness, as was once the case with politics and ideology. The increasing role of philosophy as a science about eternal values is hushed up or replaced by commercial information that has turned into a market product. For example, freedom of speech, having become a commodity, fit into market relations in all areas of public life. But, in parallel with this, the scale of the destructive influence of the media on the legal consciousness of citizens also increased, which was associated with a change in ideals in public consciousness and self-awareness.

Informatization of public relations has not only a positive impact due to increased access to it, but also a negative one, requiring scientific analysis. Prob-

lems associated with the destructive impact of the media on consciousness, legal awareness and culture indicate the need for their control by the state and law based on an integrated approach to solving them. In modern science, the consequences of the destructive impact of the media on legal consciousness and culture have not yet been sufficiently studied, although certain areas of the negative impact of information on human consciousness are becoming the subject of analysis by various sciences.

The peculiarity of the legal regulation of the interaction between local self-government and state power in the sphere of creating such legal structures that would be focused on the formation of flexible anti-crisis technologies, adapted to the challenges and threats of the information age. State intervention in the areas of local government activities must have a limit, which is the effectiveness of the market economy as a system. As a result, it becomes possible to take a fresh look at the economic function of the state, arising from the objective need for control and legal regulation of the market economy, competition, business development, etc. at the local level.

Identification of key factors influencing the law on relations between state power and local self-government expands the range of opportunities and boundaries in the field of economic and business activity. The development of alternative strategies and practices of legal regulation influence the formation of flexible anti-crisis mechanisms for adapting public authorities to the challenges of the information age, which should not both violate legally established norms and rules and radically change all aspects of social life, including public administration and local self-government, set the task of searching for new models and concepts of their interaction and development. We can also agree that before moving on to a new model of economic development that creates the prerequisites for the formation of modern social reality and the corresponding legal regulation, it is necessary to have a theoretically verified and practically implementable idea of it. Industrial revolutions, being the result of informatization of social relations, have the potential to improve the quality of life of people and solve many issues, but allow the emergence of problems that carry risks of instability and the possibility of collapse of the world economy. In these conditions, the state and law, as regulatory mechanisms of social processes, will have to adapt to new technologies, in accordance with which to build relations with business.

Research tasks related to the theoretical substantiation of the search for alternatives to the trajectories of modern socio-economic development of Russia, the study of law as a social regulator and the analysis of the prospects for its interaction with business, make it possible to identify in this process the dialectic of legal succession and modernization of the legal system in order to determine the space of risks and contradictions in it. The sociological theory of social systems as com-

munication systems is used as the basic methodological paradigm. In them, power is viewed as “code-controlled communication,” [2] and law as communication, which is regulated by a set of generally valid rules and generally accepted norms. Thus, both law and power appear as means that regulate social existence.

Modern strategies and practices of interaction between government and business are, of course, communicative in nature, and therefore must be based on generally recognized rights and freedoms of man and citizen. Thanks to the law, the authorities have the opportunity to recognize their decisions, but they must contain attractive opportunities and alternatives for business. In fact, power becomes stronger when, without resorting to violence, it ensures the stable development of the economy, which should have been paid attention to when analyzing its functions and mechanisms.

The theory of complex systems by K. Mainzer allowed us to conclude that “a new type of entrepreneurship (startups) in the aspect of the theory of a complex society is an emergent property of the nonlinear development of the modern economy.” [3] It arises during the phase transition of a complex system, when it changes its state. Indeed, as special cases of the manifestation of nonlinearity of evolutionary processes, phase transitions occur when a complex system is in a “critical state,” when the latest technologies make old types of entrepreneurship and its legal regulation obsolete. In the process of transforming some economic structures into others, it becomes necessary to create optimal control influence from the state and law as a social regulator of the interaction between business and government. This approach allows us to identify trends in the formation of a new generation economy in a multipolar world, information technologies and show that they do not yet have sufficient theoretical development, primarily in the field of methodological support for their study.

As a result of the study of the legal regulation of interactions between government and business in municipalities, the application of methods of the theory of state and law, philosophy of law, on the one hand, and the totality of empirical data obtained during the study, on the other, the following conclusions were made:

- firstly, the dynamics of social processes is determined by the unity of their stable and unstable states, as a special case of stability or instability of the system as a whole;

- secondly, the methodological basis for the study of law as a social regulator of interaction between business and government was synergistic, adaptive-systemic methods, the paradigm of a multipolar world, the concept of a complex society and others were used;

- thirdly, the main social factors of influence of interaction between business and government are identified, due to the presence of a mechanism of legal succession in the process of modernization of the legal system of Russian society and

the implementation of international law in the sphere of economic development, including traditional patterns of economic and legal behavior;

- fourthly, the expansion of the legal possibilities of legal regulation is currently blocked by informal norms that are steadily preserved and reproduced in the practice of interaction between business and government.

In conclusion, it should be noted that recently there have been prospects for the development of legal regulation of interaction between business and government in the Russian Federation, which is associated with the transition of the state and business to a new paradigm of economic development and the use of alternative technologies.

Law, as a regulator of social relations in the process of regulating the interaction between business and government, in some cases can act as a means of implementing norms, and in others it is considered as an instrument of social management. This approach made it possible to introduce law into the sphere of social management technologies, organically combining legal and managerial elements in power relations, in order to determine the possibilities and boundaries of their interaction. The modern economy is largely determined by the extent to which the principles of government regulation and motivational attitudes of business will be focused on social problems that depend on their interaction in this matter. The application for predictive prospects for studying the legal regulation of interaction between business and government is associated with the informatization of social processes, changing ways of thinking and behavior in the sphere of economics and its legal regulation.

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在执行业务侦查活动中执行预防犯罪任务所使用的刑法规范
**THE NORMS OF THE CRIMINAL LAW USED IN THE
EXECUTION OF THE TASK OF PREVENTING CRIMES IN THE
IMPLEMENTATION OF OPERATIONAL INVESTIGATIVE
ACTIVITIES**

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注解。 本文讨论了在开展业务侦查活动时运用刑法规范解决预防犯罪问题的
问题以及刑法禁令在实现其目标中的作用。

关键词：法律依据、行动搜查活动、刑法、预防犯罪、行动预防影响对象、行动
搜查活动。

Annotation. *The article discusses issues of using the norms of criminal
law in solving the problem of crime prevention when carrying out operational
investigative activities and the role of criminal law prohibitions in achieving its
goal.*

Keywords: *legal basis, operational-search activities, criminal law, crime
prevention, objects of operational-preventive influence, operational-search
activities.*

In modern conditions, all subjects of the fight against crime in general and
operational investigative activities in particular are faced with the question of the
need to increase the protection of Russian citizens from criminal threats. In these
conditions, the task of implementing ideas related to crime prevention becomes
more urgent than ever before.

Today, in the practice of operational investigative activities and in its theory,
there are different approaches to the concept of crime prevention. However, so far
not a single regulatory legal act has defined unified approaches to the concept and
content of crime prevention, and most importantly, to its organization. The use
of terms such as “prevention”, “prevention”, “prevention” of crimes, which are
nevertheless united by a single semantic load, continues to be used in different
interpretations. But their literal interpretation leads to the fact that the main thing

remains the suppression of crimes at the stage of attempts on them with the subsequent bringing of such persons to criminal punishment, while crime prevention is primarily associated with preventing the commission of crimes and, accordingly, with eliminating the causes and conditions conducive to their commission. Consequently, the lack of a basic approach to the concept of crime prevention allows practitioners, especially managers, to pass off the work of solving crimes as work of preventing them. Bringing to criminal responsibility those who have committed a crime is presented as real success in preventing the commission of subsequent crimes. However, such a position contradicts the sound logic of solving the problems of fighting crime.

In modern conditions, the role of the legal and regulatory framework for regulating legal relations that arise in the field of crime prevention during the implementation of operational investigative activities and conducting operational investigative activities (it is also called operational investigative prevention) increases due to the fact that without their existence and development it is impossible to create the necessary prerequisites for its improvement in general and operational units in particular [1]. The legal foundations of operational investigative activities not only have a targeted management impact on public relations, but also serve as an important means of improving the functioning of the very process of managing law enforcement agencies in their activities to combat crime [2, p. 23–24]. And most importantly, the task of crime prevention is defined by criminal legislation, the Federal Law “On Operational-Investigative Activities” (hereinafter referred to as the Federal Law “On Operational Investigative Activity”), and other regulatory legal requirements governing activities to combat crime.

Therefore, not to talk about crime prevention, which is implemented during the implementation of operational investigative activities within the framework of one of its organizational and tactical forms - operational investigative prevention, as an objective necessity in the fight against crime - means turning a blind eye to one of the untapped reserves of professional counteraction to criminal threats individual, society, state. “Crime prevention through operational investigative measures,” emphasized V. A. Lukashov, “is a very effective and promising area of activity for internal affairs bodies... It allows you to achieve your goals in a short time, with less material losses, provides reliable prevention of harmful consequences, and narrows the scope of application measures of criminal punishment... It is safe to say that in the future the importance of operational-search measures for the prevention and suppression of crimes... will increase significantly” [3, p. 7].

In this regard, shortcomings in preventive activities are directly related not only to shortcomings in the system of organizing preventive influence on the processes that determine crime, but also to the lack of social, including operational-search, control over criminal and criminogenic situations in the criminal environment and

its environment. At that time, crime, as is known, itself gives rise to new antisocial acts, that is, the process of its self-determination occurs, which has at least four forms of manifestation.

The first form is that one successfully committed and unsolved crime often gives rise to another. It is on this basis that group crime exists, turning the commission of crimes into a regular criminal business. It is the first form of self-determination of crime that is widespread in various social groups.

The second form is the commission of crimes of minor and medium gravity, which entails serious and especially serious crimes. Adjacent to this form is “post-criminal” activity, which is also often associated with the commission of new (other) crimes - concealing a more serious crime with a less serious one. Thus, one crime gives rise to another and this inevitably affects the entire criminogenic and criminal situation.

The third form is associated with organized crime and corruption. Once an organized group (criminal community) is created, it gives rise to a very wide range of various criminal activities, in which not only its members, but also law-abiding citizens often take part. Moreover, each such group contains for “dirty work” not only repeat offenders or previously convicted persons, but also civil servants, criminal justice and law enforcement officers.

The fourth form manifests itself through the psychology of a criminal or a person in a pre-criminal state. If crime is high, and the persons committing crimes have not been found, a special psychological state arises in unstable persons, allowing them to commit criminal acts and the possibility of avoiding punishment. This is the so-called legal nihilism in the behavior of the above-mentioned persons, in which they do not believe in the norms of criminal law, morality and are easily inclined to commit a crime, focusing on the weak effectiveness of the law enforcement system. Thus, the very presence of crime not only does not contribute to its reduction, but significantly provokes its further growth [4, p. 25–26].

Self-determination of crime is a dangerous phenomenon that greatly complicates its operational investigative prevention. To overcome it, it is necessary to ensure the principle of the inevitability of punishment for all categories of criminals, to prevent relapse, to eliminate criminal groups, whose members, as a rule, are ardent adherents of the criminal subculture, which provokes citizens to disrespect the law [5, p. 106–108].

Therefore, once again I would like to emphasize the idea that operational investigative prevention cannot be associated only with the disclosure of crimes that have already been committed. In the course of solving crimes, employees of operational units can identify the causes and conditions that contribute to the commission of a specific crime, the circumstances that provoke a specific person to commit it. However, measures to eliminate them, as well as influence on a specific

person in order to ensure his refusal to commit a crime, go beyond the scope of activities to solve the crime. However, at the same time, the law always introduces practice into a strict framework, creates certain restrictions on the possibilities of using organizational and tactical methods, methods and means, including in crime prevention [6, p. 3, 6–9, 12–13]. This can be fully attributed to the norms of criminal law, which are directly related to the legal foundations of operational investigative activities [7]. The norms of criminal law consist of a targeted influence on people's behavior by normatively consolidating and protecting the prerequisites for the socially significant activities of its subjects. That is why all researchers of the legal foundations of operational investigative activities give a fundamental place among the sources of legal regulation of crime prevention during its implementation to criminal legislation [8].

Firstly, the very existence of this branch of law plays an important role in the prevention of crimes, which is reflected in the objectives of criminal legislation (hereinafter referred to as the Criminal Code of the Russian Federation), in art. 2 and the purposes of punishment (Article 43). In Part 2 of art. 43 of the Criminal Code of the Russian Federation determines that the purpose of punishment is to correct the convicted person and prevent the commission of new crimes. Thus, the norms of criminal law, along with protective ones, also perform preventive functions. That is, on the one hand, they warn against committing rash acts that may entail criminal punishment, and on the other hand, they prevent the recurrence of crimes. This becomes possible through the formulation of criminal law prohibitions, as well as the so-called empowering, permissible norms [9, p. 9].

In the interests of protecting a potential victim of a crime, the Criminal Code of the Russian Federation has significantly expanded the list of circumstances excluding the criminality of an act (Articles 37–42). In addition to the previously known (necessary defense; causing harm during the detention of a person who has committed a crime, extreme necessity), these include physical or mental coercion, reasonable risk, execution of an order or instruction. These norms, as I. M. Tyazhkova rightly notes, encourage a person to actively oppose the criminal [10, p. 13].

The rules governing the system of punishments, the procedure and conditions for their appointment, exemption from punishment, and their mitigation (see, for example, Articles 43–96) create the legal prerequisites for proactive work with persons who have come into conflict with the law (private prevention). We are talking about establishing a certain legal regime for convicts, as well as persons exempted from criminal liability and punishment, in particular, about establishing for them certain legal restrictions and special rules of behavior. For example, the institution of a criminal record (Article 86) provides the basis for the implementation of operational-search prevention in relation to persons who have already been subjected to criminal punishment and have been released from prison. The

Criminal Code of the Russian Federation provides for the possibility of imposing compulsory educational measures on minors who have committed crimes (Articles 90–92). Articles 30 and 31 of the Criminal Code of the Russian Federation regulate the grounds of liability for preparation and attempted crime, voluntary renunciation of a crime.

The Special Part of the Criminal Code of the Russian Federation should highlight, for example, such rules of a preventive nature as liability for various types of threats (for example, Articles 119, 120, 1271, 1272, 131, 139, 161, 162, 296); involvement in the commission of a crime, antisocial actions (for example, Articles 150, 151, 205, 240); actions related to illegal trafficking of weapons (for example, Articles 222, 223, 225) [11, p. 198].

Particular attention should be paid to the preventive nature of Sec. 22 of the Criminal Code of the Russian Federation “Crimes in the field of economic activity”, which was introduced in connection with changes in economic relations in society. For the first time, for example, liability has been established for the registration of illegal transactions with real estate (Article 170), illegal entrepreneurship (Article 171), illegal banking activities (Article 172), legalization (laundering) of funds or other property acquired by other persons through criminal by (Article 174), illegal receipt of a loan (Article 176), illegal use of means of individualization of goods (works, services) (Article 180), crimes related to bankruptcy (Articles 195–197), crimes related to payment evasion taxes (Articles 198, 199).

The Criminal Code of the Russian Federation has rules providing for the release from criminal liability of persons who have committed crimes, including voluntary renunciation of the crime (Article 31) and active repentance (Article 75). These are the so-called incentive norms [12, p. 240–243]. They are available both in the General and Special Parts of the Criminal Code of the Russian Federation and also have a warning value. In the Special Part of the Criminal Code of the Russian Federation, these are rules on liability for crimes provided for, for example, art. 122, 126, 1271, 204, 205, 2051, 206, 208, 210, 222, 223, 228, 275, 276, 278, 2821, 2822, 291, 307, 337, 338 and a number of others.

Secondly, the norms of criminal legislation define the concept of a crime and its signs, that is, against what actions or inactions should operational-search activities be directed in order to solve their problems (Article 14 of the Criminal Code of the Russian Federation and Articles 1, 2 of the Federal Law “On Operational Investigations” “).

Thirdly, in parts 3, 4, 5 of art. 15 of the Criminal Code of the Russian Federation gives the concept of a crime of medium gravity, grave and especially grave crime, knowledge of which allows one to make a decision on the possibility or impossibility of carrying out those operational investigative measures that limit the constitutional rights of citizens to the secrecy of correspondence, telephone

conversations, postal, telegraph and other messages, transmitted over electrical and postal communication networks, as well as the right to the inviolability of home in urgent cases, without first obtaining a court decision (Part 3 of Article 8 of the Federal Law “On Operational Investigations”). The concept of a crime of moderate gravity, grave and especially grave is also associated with conducting an operational experiment. The law allows its implementation only for the purpose of identifying, preventing and disclosing such crimes and the persons who prepare, commit or have committed them (Part 8 of Article 8 of the Federal Law “On Operational Investigations”).

Fourthly, by specifying the types of criminal behavior in the norms of the Special Part of the Criminal Code of the Russian Federation, the legislator thereby allows operational units to identify objects of operational-preventive influence and operational service. Yes, Art. 325 (theft or damage to documents, stamps, seals or theft of excise stamps, special stamps or marks of conformity) targets the relevant operational units with the need to service the places of production of these items - printing houses, engraving workshops and their employees. The norms of art. bear a similar burden. 218 (violation of the rules for accounting, storage, transportation and use of explosives, flammable substances and pyrotechnic products), art. 221 (theft or extortion of nuclear materials or radioactive substances), art. 222 (illegal acquisition, transfer, sale, storage, transportation or carrying of weapons, their main parts, ammunition), art. 223 (illegal manufacture of weapons), art. 228 (illegal acquisition, storage, transportation, production, processing of narcotic drugs, psychotropic substances or their analogues, as well as illegal acquisition, storage, transportation of plants containing narcotic drugs or psychotropic substances, or their parts containing narcotic drugs or psychotropic substances), art. 229 (theft or extortion of narcotic drugs or psychotropic substances, as well as plants containing narcotic drugs or psychotropic substances, or their parts containing narcotic drugs or psychotropic substances) and a number of others.

It is also necessary to take into account the provisions of such a criminal law institution as extreme necessity (Article 39), since when carrying out an operational task a situation may arise when, in order to prevent a danger that actually threatens the legitimate interests of the subjects of operational investigative activities and operational investigative measures, society or the state, harm is caused to third (outside) persons, provided that the threatening danger under the given circumstances cannot be eliminated by other means, and the damage caused will be less significant compared to the crime prevented [13, p. 109–110].

The most serious criminal legal consequences occur in case of violation of the requirements of the Federal Law “On Operational Investigation” to ensure the constitutional rights and freedoms of citizens (Article 137 of the Criminal Code of the Russian Federation - Violation of privacy; Article 138 of the Crimi-

nal Code of the Russian Federation - violation of the secrecy of correspondence, telephone conversations, postal, telegraph or other messages; Article 139 of the Criminal Code of the Russian Federation - illegal entry into a home; Article 140 of the Criminal Code of the Russian Federation - refusal to provide information to a citizen). For violation of the principle of secrecy and the requirements of art. 12 (Protection of information about bodies carrying out operational investigative activities) Federal Law “On Operational Investigation”, officials who have access to information constituting state secrets may be brought to criminal liability for their disclosure (Article 283) or loss of documents containing state secrets (Article 284) [14, p. 49–50].

In conclusion, it can be noted that the history of the formation and development of legal regulation of operational investigative activities reveals the scope of study of what, in fact, most researchers of these problems were not specifically interested in. Of course, they attracted the attention of scientific specialists related to the theory and practice of operational investigative activities, but their interest in this area was limited and not always objective. Despite this, in various historical periods of Russian statehood, regular attempts were made to legally regulate operational investigative activities [15, p. 433–486]. These attempts were inextricably linked with the history of the formation and development of the functions of the criminal police in Tsarist Russia, and subsequently the operational units of the Russian Federation.

It should be added to this that the main strength of law is that “it is a condition and guarantor of legally protected active behavior of persons... and, therefore, a condition and guarantor of people’s activity, their independent action, their initiative, entrepreneurship”[16 , With. 97–98]. This judgment of S. S. Alekseev is especially important in relation to covert operational investigative activities, which are based on a system of legal norms provided for by various sources of law, which constitute its legal basis [17, p. 457]. And no less important of these sources is the criminal legislation of the Russian Federation.

As for the principle of inevitability of punishment, bringing persons to criminal liability for a crime committed, for example, for illegal trafficking in weapons, ammunition, explosives and explosive devices, it should be considered as a norm with double prevention. Thanks to it, it is possible to prevent more serious crimes that entail irreversible consequences (acts of terrorism, banditry, murder, robbery, etc.). In this way, the constitutional duty of protecting the rights and freedoms of man and citizen and the purpose of operational investigative activities will be more effectively implemented, and its fundamental task - preventing the commission of crimes - will be solved.

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腐败作为一种社会消极现象：历史和法律方面
**CORRUPTION AS A SOCIALLY NEGATIVE PHENOMENON:
HISTORICAL AND LEGAL ASPECTS**

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注解。 本文探讨了俄罗斯腐败作为一种社会负面现象形成的历史原因。 因此，该研究指出了俄罗斯法律的最初来源，特别是：13世纪初的编年史、1397-1398年的《德维纳宪章》、1397-1467年的《普斯科夫判决宪章》、1550年的《法律法典》，其中提到了“贿赂”、“勒索”、“许诺”和“喂饱”等腐败行为。 此外，作者还分析了自彼得·伊藤统治时期以来俄罗斯立法史上反腐败斗争的形成以及对这些行为的刑事责任规定的起源。

关键词：腐败历史； 腐败行为； “承诺”； “喂养” 机构； 渎职。

Annotation. *The article examines the historical aspects of the formation of corruption in Russia as a socially negative phenomenon. Thus, the study indicates the first sources of Russian law, in particular: chronicles at the beginning of the 13th century, the Dvina Charter of 1397-1398, the Pskov Judgment Charter of 1397-1467, the Code of Laws of 1550, in which such acts of corruption as “bribery”, “extortion”, “promise” and “feeding” were mentioned. In addition, the author analyzes the genesis of the formation of the fight against corruption and the regulation of criminal liability for these acts in the history of Russian legislation from the beginning reign of Peter I to date.*

Keywords: *history of corruption; acts of corruption; “promise”; institute of “feeding”; malfeasance.*

Corruption as a socially negative legal phenomenon has an increased social danger, encroaches on the interests of state power, contributes to the destruction of constitutional foundations and deforms the legal consciousness of citizens.

This phenomenon, being one of the global problems of most states, has its own history of origin and development. In history, corruption has been recorded since the emergence of the first states, such as Mesopotamia (IV millennium BC), Egypt (IV – III millennium BC), Ancient Greece (II – I millennium BC .e.) and others.

In Russia, corruption has its own historical periods, among which scientists highlight the following:

- early, associated with the adoption of the first legislative acts providing for liability for corruption in the imposition of punishment and its execution - XV-XVI centuries;

- pre-reform and post-reform periods – XVII-XVIII centuries;

- Soviet period – 1918-1992;

- post-Soviet period from 1993 to the present [12With. 36-41].

Note that the term “corruption” was not used in Russian legislation and was introduced into scientific circulation only at the beginning of the 20th century. However, facts of abuse by officials of their official powers, as well as bribery, existed before this period.

The problem of combating corruption was reflected in chronicles at the beginning of the 13th century. Such acts were interpreted as “bribery” and “extortion.” Officials who received a bribe for performing their duties were considered bribe-takers, and covetous were considered to be those who received bribes for committing illegal actions. Accordingly, “extortion” was considered a more serious crime and the punishment for these acts was more severe.

The first mention of a promise, as some kind of reward for the exercise of official powers, in the legislation of Rus’ is associated with the Dvina charter of 1397-1398. In particular, it stated that “And lynching is four rubles; and lynching is: whoever, having caught the thief red-handed, let him go and take back the promise for himself...” It follows from this that “promises” became widespread and were initially allowed for an objective and diligent investigation of the case, but the current situation led to the receipt of secret “promises”, and, consequently, to official abuses and connivance. Already in the Pskov Court Charter of 1397-1467, the concept of a “promise” was reduced to a bribe, and was prohibited from receiving persons holding certain positions. So, the document says: “And the secrets of the promises are not imati to either the prince or the posadnik” [1].

An official ban on corrupt acts was introduced under Ivan III after the adoption of the Code of Law of 1497: “And the promises of a boyar, and a parson, and a deacon from the court and from the sadness do not imati; so do not imati dishes from the court to any judge.”[11, p. 115-116]. Ivan the Terrible fought more radically against corruption. In 1550, on the basis of the judicial law of 1497, the tsar issued a Code of Law, according to which a bribe was recognized as a crime: “but do not make friends with the court, and do not take revenge on anyone, and do not make promises in court: likewise, do not make promises to any judge ...” and strictly Punishable by: imprisonment, whipping and death [7]. At the same time, the punishment was differentiated taking into account the position held. Thus, a clerk (high-ranking official) was sentenced to imprisonment for receiving a prom-

ise. At that time, the death penalty or whipping was applied to the clerk (medium and low-level official).

Simultaneously with the promises, the fight against “feeding” was carried out. This institution as a form of political-legal government existed from the middle of the 11th century. and until the middle of the 16th century, becoming most widespread in the second half of the 14th – mid-16th centuries. The rooting and expansion of the scale of “feeding” has led to abuse and abuse of their official powers by officials, and, consequently, to an increase in corruption manifestations. The current negative situation contributed to the growth of discontent among the population, as a result of which this institution was legally abolished by Ivan the Terrible in 1555-1556.

In general, as an analysis of studies of Ivan the Terrible’s fight against corruption shows, over the 37 years of his reign, more than 8 thousand officials were punished, which amounted to more than a third of their total number. Of course, such measures reduced the number of corruption, however, despite tough measures, officials continued to take bribes.

An active fight against corruption was carried out during the reign of Peter I. With the cessation of the functioning of the institution of “feeding,” the bureaucracy began to be paid a fixed salary, and any donation to officials was considered bribery. On the basis of the Decree of December 24, 1714 “On the prohibition of bribes and promises and on punishment therefor”, the following were imposed for acts of corruption: confiscation of property, death penalty [2]. With the introduction of the Military Article on April 25 (May 6), 1715, the death penalty was imposed for official crimes, which included: embezzlement, bribery, selfish abuse of power[8]. Thus, under Peter I, the most severe measures began to be used against bribe-takers: beatings, branding, exile, executions. After the death of Peter I, due to a lack of funds in the treasury, it was necessary to return again to the previous system of providing for officials - “feeding”. Clerical employees without salary were allowed to “take an accident from business.”

The fight against corruption resumed under Catherine II. During her reign, the institution of “feeding” was completely eliminated, with the introduction of significant salary payments to officials. The queen expected honesty and integrity in the performance of their duties on the part of officials, without establishing harsh penalties for bribery and abuse. In addition, the bribe giver acted as a victim who could claim some compensation. So, if, in the event of giving a bribe, he immediately denounced the taker, he would receive double or triple compensation for the bribe at the expense of the bribe-taker. However, the measures introduced by Catherine II did not curb the spread of bribery among officials.

Analysis of the history of corruption in the 19th century showed that during this period corruption became widespread again. Despite the adoption by Nicho-

las I in 1845 of the first criminal code in the history of Russian legislation, “Code on Criminal and Executive Punishments”, it limited punishment for bribery and extortion to a fine or dismissal, and in special cases – arrest and deprivation of property [12]. In addition, despite the fact that extortion of a bribe was considered the most serious crime (Article 377 of the Code), the maximum punishment for it was limited to confiscation of property and reference to hard labor [12]. Thus, as the history of the existence of corruption during this period shows, existing measures did not contribute to the effectiveness of the fight against corruption; moreover, it participated in the mechanism of public administration. Thus, in particular, the landowners of all the provinces of Right Bank Ukraine annually collected a considerable amount for the police. Kiev governor I. I. Fundukley explained this by saying that if landowners do not allocate funds for the maintenance of police officials, “then they will receive these funds from thieves” [9].

It was not possible to eradicate bribery even after the change of the political regime. After the overthrow of the tsarist government, a radical restructuring of all spheres of state life began. At this time, there was a spontaneous expansion of the bureaucracy, which led to an increase in cases of abuse of power by civil servants. From the beginning of 1917, as part of the fight against corruption, the new government adopted legislative acts that were aimed at eradicating it. The most significant of them include: Decree of November 10, 1917 “On the abolition of estates and civil ranks”, Resolution of the Council of People’s Commissars of the RSFSR dated July 27, 1918 “On limiting the joint service of relatives in Soviet institutions” and others. These regulations have made a certain contribution to the prevention of malfeasance. In May 1918, the Council of People’s Commissars issued a decree “On Bribery” [3], providing for imprisonment combined with forced labor for bribery for a period of five years, as well as confiscation of property. However, this document had a number of legislative inaccuracies, which acted as a criminogenic factor for the increase in the number of corruption crimes. The current situation required the adoption of a new decree of August 16, 1921 “On the fight against bribery,” which took into account the regulatory gaps and errors of the previous law.

Later, in 1922, in accordance with the adopted Criminal Code of the RSFSR for bribery (Articles 114-115) and other official crimes: abuse of power, abuse of power, inaction of authorities, etc. (Articles 105-113) punishment was imposed in the form of imprisonment, and in particularly aggravating circumstances - capital punishment [4]. It should be noted that the basic provisions of the last decree were included in the basis of this criminal law, namely in Chapter II “Official (official) crimes”.

In addition to the measures introduced by the criminal law, active people’s control was also carried out at all production enterprises and organizations, which

made it possible to identify bribe-takers and persons abusing their official powers. However, the strict anti-corruption system that existed at that time did not give the expected result in eradicating it. Despite a significant decrease in its level, the number of such acts remained quite high [10].

During the years of the NEP, an increase in corruption was again noted, which is associated with the spread of entrepreneurial activity. At this time, bribery was equated with counter-revolutionary activity. F. E. Dzerzhinsky noted in a circular letter that in all areas of economic activity, bribery has reached critical proportions, especially widespread in transport. He actively fought against these acts, in particular, on his instructions; every official of the department entrusted to him who was caught taking a bribe was subjected to capital punishment practically without trial or investigation.

By the end of the 20s, the fight against corruption had the character of massive punitive measures, which were characterized by widespread and one-time hearings of bribery cases with subsequent publication of them in the newspaper. These anti-corruption measures were carried out throughout the country as a single, massive and organized judicial punitive campaign.

However, after the abolition of the NEP, “shadow business”, closely connected with crime and corruption, began to actively develop. The so-called “trade under the counter” has become commonplace, found in almost every store. Scarce goods could be purchased for a certain fee by agreement, which is a classic example of corruption in that period [11 p. 154-156].

In the Soviet Union, for almost thirty years, corruption was considered a relic of bourgeois society, so it was generally accepted that as socialism was built, this phenomenon was eradicated. Even if there were known cases of receiving bribes, they tried to keep silent about them [5 p.211-215].

With the collapse of the USSR, corruption gained momentum. The change of political power, the weakening of the state, the lack of a clear legislative framework, and the decline of moral principles contributed to the commission of these crimes. However, despite its scale, the problems of corruption were of a secondary nature compared to other more serious problems. It was necessary, first of all, to stabilize the situation in all spheres of life of Russian society. In addition, the aggravated crime situation in the country (banditry, racketeering, murder and other criminal manifestations), the active development of organized crime and its merging with political power objectively contributed to the strengthening of corruption.

With the coming to power of President V.V. Putin began an active fight against corrupt officials. So in 2006, he signed laws on the ratification of the most important international conventions against corruption: the UN Convention against Corruption and the Council of Europe Criminal Law Convention on Corruption. The UN Convention regulates the interaction of law enforcement agencies of various

states in the fight against corruption, and also establishes a number of standards in anti-corruption policy. Since the entry into force of the Council of Europe Convention, Russia has become a member of the Group of States against Corruption (GRECO), and in 2012 joined the OECD Convention against Bribery of Foreign Public Officials. In addition, a number of national laws were adopted regulating the fundamentals of combating corruption, in particular Federal Law dated December 25, 2008 N 273-FZ “On Combating Corruption,” as well as other local regulations.

Thus, it should be concluded that corruption has existed in Russia for quite a long time. At the same time, at different times it was either the norm or prohibited by law. Currently, this socially negative phenomenon, which contributes to a slowdown in the economic growth of the state, inefficient distribution and expenditure of public funds and resources, a decrease in the efficiency of the state apparatus as a whole, an increase in social inequality, and a decrease in public morality, is classified as one of the dangerous types of crime.

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性格强调：人类行为的诊断、分析、预测和管理
**CHARACTER ACCENTUATIONS: DIAGNOSIS, ANALYSIS,
PROGNOSIS AND MANAGEMENT OF HUMAN BEHAVIOR**

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抽象的。这篇文章讨论了性格的僵化，指示性，迂腐（癫痫样），爆发性，情绪高涨，情绪低落，焦虑，兴奋，情绪化，摆线重音，根据这些性格，僵化（卡住），指示性，迂腐（癫痫样），爆发性（兴奋），情绪高涨、心境恶劣、焦虑、亢奋、情绪化、摆线人格类型。作者得出的结论是，性格强调理论的知识可以对人类行为进行诊断、分析、预测和管理。

关键词：性格强调、性格、行为、刻板、示威者、学究、易激动型、情绪高涨、忧郁、焦虑、亢奋、情绪化、摆线人格类型。

Abstract. *The article discusses rigid, demonstrative, pedantic (epileptoid), explosive, hyperthymic, dysthymic, anxious, exalted, emotive, cycloid accentuations of character, according to which rigid (stuck), demonstrative, pedantic (epileptoid), explosive (excitable), hyperthymic, dysthymic, anxious, exalted, emotive, cycloid personality types. The author comes to the conclusion that knowledge of the theory of character accentuations allows for diagnosis, analysis, prognosis and management of human behavior.*

Keywords: *character accentuations, character, behavior, rigid, demonstrator, pedant, excitable type, hyperthymic, disthymic, anxious, exaltant, emotive, cycloid personality type.*

Accentuation of character is an extreme expression of a character norm, which (unlike psychopathy) manifests itself “not always and everywhere,” but only under stress.

Each person has one or another of the listed character accentuations, which can be more or less pronounced. In addition, people often have several character accentuations at once. The more character accentuations a person has, the more complex, problematic personality he is (persons with many character accentuations are called polyaccentuated).

(1). Rigid (schizoid, paranoid) character accentuation (stuck type) means that such people live and act under the influence of undying emotional experience, long-term, tending to develop, often carefully hidden passion. They are patient, uncompromising “fighters” waging their own undeclared war, stubbornly defending personal superiority over the enemy. Having suffered defeat, they do not despair, do not become discouraged, on the contrary, they draw strength for a new struggle. Critical remarks are taken as a personal insult. They have high emotional sensitivity in the system of relationships. According to Karl Leonhard, they are characterized by rigidity of affect “at the level of egoistic motives.” Discharging affect is difficult or often impossible. They are prone to long-term experiences. Fixed on a specific, personally significant goal. Their self-esteem is usually inflated. They have an excellent memory, high learning ability, and a high level of aspirations. Purposeful. A rigid personality is often dominated by some overvalued idea, for which they are ready to sacrifice their lives and the lives of other people.

1.1. Socially adaptive traits of a rigid personality: high performance; maintaining interest in one object for a long time; integrity, uncompromisingness; lack of tendency to self-hypnosis; high competitiveness; low susceptibility to group influence.

1.2. Maladaptive features of a rigid personality: arrogance; self-confidence; ambition; painful pride, touchiness; rancor; vindictiveness; lack of empathy, hostility towards others; unfounded suspicion; jealousy; fanaticism.

1.3. Professional characteristics of a rigid personality: in the chosen field (production, creative) of activity they achieve high results, are resistant to interference, efficient, active; There is marked perseverance and a desire for achievements in career growth. If a goal is set, then its achievement is organized at all costs, regardless of conditions and circumstances. Criticism from others develops stress resistance and enhances “in spite” type motivation. Among people with schizoid accentuation one can find not only excellent scientists, artists, politicians, collectors, lawyers (investigators, judges, prosecutors), priests, but also religious fanatics and suicide bombers.

1.4. Stressful situations for a rigid personality: situations of uncertainty, violation of the predicted perspective; personal challenge, expression of doubt about personal merits; ridicule.

1.5. Typical ways of coping with stress for a rigid personality: hostility, aggressiveness; suspicion; autism; finding the meaning of life in one’s own activities.

1.6. Pathological dynamics of the character of a rigid personality: the formation of overvalued ideas; reduction of emotional contacts, alienation; undifferentiated aggressiveness; paranoid tendencies.

1.7. Examples of questions to identify rigid accentuation of character during an express conversation: the stuck type gives positive answers to questions like:

1) “Are you susceptible to insults?”, 2) “Do you always try to be conscientious in your work?”, 3) “Do you fight for your interests if someone treats you unfairly?”, 4) “Do you usually express to people your frank opinion on this or that issue?”, 5) “Are you inclined to stand up for the person you treated? unfair?”, 6) “Do you persistently strive for your goal, even if there are many obstacles along the way?”, 7) “Do you suffer greatly from injustice?”, 8) “Do you endure anger for a long time?”, 9) “Can we say that you are more distrustful and cautious than gullible?”, negative answers to questions like: 1) “Do you quickly forget if someone offends you?”, 2) “Will you take the first step towards reconciliation if someone insults you?”, 3) “During your school years, did you have to use hints or copy from Comrades homework?”

(2). Accentuation on the “demonstrativeness” scale means that the subject is psychologically comfortable being in the center of attention; such people know how to perfectly adapt to the situation, are gentle in communication, observant, artistic, charming, with a developed imagination, and have the ability to organically get used to a role that suits their interests; are proactive, able to captivate others with the eccentricity and originality of their actions and thoughts, and are often informal leaders; succeed in those activities where success largely depends on the impression they make; overwhelmed by the need for recognition, they strive to look more significant and attract attention at all costs; self-centered (focused solely on their own interests); they need to be talked about, looked at, admired; prone to manipulative behavior.

2.1. Socially adaptive traits of a demonstrator: determination, courage; sociability, friendliness; artistry, charm; high learning ability; high plasticity, switchability of mental processes; pronounced abilities for self-hypnosis and self-regulation; good knowledge of people; developed intuition; developed communication skills; high achievement motivation; the desire to implement the highest socially approved standards in one’s own activities; the ability to easily navigate in any situation; the ability to see and gain one’s own advantages in the most unfavorable conditions; the ability to transform conflict situations into mutually beneficial ones.

2.2. Maladaptive characteristics of the demonstrator: unstable self-esteem; self-identity problem; lack of boundary between fiction and reality; sentimentality in the absence of truly deep feelings; tendency to aggravation (exaggeration), posturing, hypocrisy; deceit; poorly developed ethical complex; adventurism; inability to work for long periods of time with a high level of aspirations; reassessment of one’s capabilities; a tendency to intrigue with an externally soft manner of communication; claims to primacy in any situation, often unfounded; tendency to provocative behavior; the tendency to imitate various affective reactions, often for personal gain.

2.3. *Professional characteristics of the demonstrator*: in professional activities, demonstrators achieve success in those areas where the problem of orientation in an unpredictable situation comes first, in creative, communicative professions; the desire for originality and external effects, combined with determination, artistry, and charm, makes them indispensable employees in the field of negotiations, for example, to create and maintain the image of the organization.

2.4. *Stressful situations for a demonstrator*: regulated operating conditions; expressing doubt about the merits of the demonstrator; monotonous activity; time limit; frustration (dissatisfaction) of needs.

2.5. *Typical ways for a demonstrator to cope with stress*: expanding contacts; change of activity; fantasizing; negation; crowding out.

2.6. *Pathological dynamics of the demonstrator's character*: hysterical personality disorder.

2.7. *Examples of questions to identify demonstrative accentuation of character during an express conversation*: persons with demonstrative accentuation of character (demonstrators) give positive answers to questions like: 1) "Do you like to be the center of attention?", 2) "Did you like to recite at school poems?", 3) "Can you easily adapt to a new situation?", 4) "Can you be friendly with people without revealing your true attitude towards them?", 5) "Can you easily distract yourself from burdensome questions and not think about them?", 6) "Did you willingly participate in amateur art groups and theater groups in your youth?"; negative answers to questions like: "Would it be difficult for you to perform on stage in front of a large number of spectators?"

(3). Pedantic (epileptoid) accentuation of character means that the leading characteristics of people of this type are conscientiousness, accuracy, and punctuality. They not only meticulously know the norms (rules) regulating their activities, but also strive to follow them themselves and demand this from others. They make decisions carefully, only on the basis of verified facts. They can achieve good results at work thanks to a thorough and comprehensive analysis of upcoming activities. They trust only their own results. They have high performance. Highly sensitive to errors in activity. They have a high level of aspirations. Focused on their own criteria and assessments. They can cede leadership to other people if this is required to achieve a common goal. They rarely enter into conflicts. Empathy for other people is poorly developed or absent, they can give the impression of people being emotionally stupid and heartless.

3.1. *Socially adaptive traits of a pedantic personality*: reliability, accuracy, thoroughness in performance; strict adherence to standards; under predicted conditions, low emotionality; constant desire to learn and improve skills; demanding of oneself and others; desire for planning (the pedant builds his activities on the

basis of planning, is a “plan man”, whose slogan can be the statement that “there is a plan, according to the plan, life will go on”).

3.2. *Maladaptive features of a pedantic personality: difficulty making decisions*; difficulties adapting to new conditions; formalism (under stress they can become zealous bureaucrats, making too many formal demands on others).

3.3. *Professional characteristics of a pedantic personality*: persons with a pedantic personality are conscientious, careful, subject their activities to a thorough and comprehensive analysis, and are worthy of high trust from management and colleagues. They do not pretend to leadership, they willingly cede leadership to other people, therefore they easily adapt to positions of deputy head, to staff work, since the headquarters (organizational planning unit) is the main planning, controlling, organizing and governing body, and people with pedantry are prone to planning, frequent checks and self-tests, which makes them effective in carrying out control and verification activities.

3.4. *Stressful situations for a pedantic personality*: conditions of choice with a large number of alternatives; making and implementing decisions under time limits and high responsibility.

3.5. *Typical ways of coping with stress of a pedantic personality*: search for regulatory information, an algorithm of actions; rationalization; somatization (withdrawal into illness).

3.6. *Pathological dynamics of the character of a pedantic personality*: obsessive-compulsive neurosis.

3.7. *Examples of questions to identify pedantic accentuation of character during an express conversation*: persons with pedantic accentuation of character give positive answers to questions like: 1) “Does a hanging picture or an unevenly laid tablecloth really bother you, so much so that you want to immediately eliminate this shortcoming?“, 2) “Do you try to check after you put a letter in the mailbox whether it remains hanging in the slot?”, 3) “Do you consider other people to be insufficiently demanding of each other?”, 4) “Do you fulfill Do you do painstaking menial work as slowly and carefully as you do what you love?”, 5) “Would it be difficult for you to fall asleep if you spent the whole day thinking about your future or some problem?”, 6) “Do you keep track of your great attention, so that every thing in the house is in its place?”, 7) “Do you have the habit of checking before going to bed or before leaving whether the gas and lights are turned off, whether the door is closed?”, 8) “Has At school, do you have the habit of copying out a piece of paper in your notebook if you put a blot on it?“, negative answers to questions like: “Are you willing to engage in activities associated with great responsibility?”

(4). Explosive accentuation (excitable (explosive) personality type) means that for people of this type, the decisive factor for both lifestyle and behavior

in general is not prudence, not the logical weighing of their actions, but drives, instincts, uncontrollable impulsive impulses. They do not take into account what their reason tells them. Self-centered. The boundaries of one's own "I" are clearly delineated. Suggestible. The amplitudes of their emotional reactions are incommensurate with the reason that prompted them. Emotional reactions develop rapidly, violently, according to the affective type, expressed in behavior in the form of release, more of a physical than a moral nature. They have high speed and intensity of motor behavior. They strive for competition, mainly in the psychomotor sphere of behavior. For people of the excitable type, personal desire is practically the only stimulus for behavior, and one's own physical strength is the main way to satisfy this desire. For persons with an explosive (excitable) character, physical labor is often an adequate type of activity. They are distinguished by an uncompromising desire for victory, disregard for their own injuries and dangers. This often allows people of the excitable type to achieve significant results. In a calm state, they are impressionable, responsive, careful, conscientious, and can love small children and animals.

4.1. *Socially adaptive traits of an explosive personality*: spontaneity, determination, courage; use of all available means, originality in choice; achieving results "here and now"; high achievement motivation; desire for leadership; socially expressed role of "defender of the weak," "superman," "hero"; sensitivity, tenderness, attentiveness to those who need his protection, patronage, trust him; uncompromisingness; a high self-evaluation; high level of aspirations.

4.2. *Maladaptive features of an explosive personality*: limited behavioral programs; peremptory nature; conflict; irritability; impulsiveness; aggressiveness; weak self-regulation and self-control; rudeness, cruelty; quarrelsomeness in the team; despotism in the family.

4.3. *Professional characteristics of an explosive personality*: in professional activities, persons of the described type are ready to set themselves the most unrealistic goals, as long as they correspond to the person's individual value system. Physical work, extreme conditions, risk situations, powerful jerks are excellent conditions for the implementation of this character trait. The ability to heroically defend positions, measure strength, speak out for justice, pave the way - in certain professions these are irreplaceable qualities worthy of respect.

4.4. *Stressful situations of an explosive personality*: frustration of needs; making a choice from many alternatives; monotony of activity; situations where a person's personal dignity is questioned.

4.5. *Typical ways of coping with stress*: direct verbal or non-verbal aggression; substitution; physical release.

4.6. *Pathological dynamics of hyperthymic character*: irritability, in extreme severity - vulgarity, rudeness, aggressiveness; lack of criticism of one's own condition.

4.7. *Examples of questions to identify explosive accentuation of character during an express conversation:* persons with excitability give positive answers to questions like: 1) “Do you have days when you are in a gloomy and irritable mood without sufficient reason and do not want to talk to anyone? ”, 2) “Is your mood often depressed?”, 3) “Can you get angry quickly?”, 4) “Did you run away from home as a child?”, 5) “Can you lose your temper and let loose hands if someone deliberately rudely angers you?”, 6) “Are you sometimes drawn to look into the distance?”, 7) “Is it difficult for you to restrain yourself if you get angry?”

(5). Accentuation on the scale of hyperthymia means that the subject from childhood (subject to a free upbringing, without strict regulation) is distinguished by noisiness, mobility, activity, and a tendency to take initiative, which is not always reasonable and deliberate. He is not characterized by manifestations of timidity and shyness. The feeling of distance and maintaining subordination in relationships are problematic for him. Often he is not interested in the result of the activity, but in the process itself. Characterized by a thirst for intellectual activity, good working memory, high attention span, quick intelligence, developed versatile abilities, a wide range of behavioral programs, unpredictability. The desire for leadership appears as an organically inherent hyperteam; it tends to be the soul of any company. He is distinguished by low emotional sensitivity to his own mistakes, a high level of aspirations, and not always an adequate assessment of real possibilities and his own resources. As a rule, hyperthymics always have their own opinion about what is happening. High reactivity, developed speech, erudition combined with emotional stability, determination, and courage determine the success of hyperthymics in a number of professional areas in various positions.

5.1. *Socially adaptive features of hyperthymia:* optimism, love of life, developed sense of humor; altruism, sociability, initiative, high achievement motivation, independence from situational changes and the opinions of others.

5.2. *Maladaptive features of hyperthymia:* inability to concentrate for long periods of time, instability to interference; low self-regulation, expressed in lack of patience, restlessness; the desire to do everything combined with constant haste and eternal delays; reluctance, inability to complete the work started; willingness to take unjustified risks; inability to identify stages in the selected activity; adventurousness: “all or nothing.” Unproductive activity, projectism, amateurism. Instability of interpersonal relationships, illegibility in contacts. Lack of discipline, irresponsibility. Susceptibility to group influence.

5.3. *Professional characteristics of hypertim:* such people are effective at the beginning of organizing any business, in a new environment, in extreme situations, in conditions of risk; motivation for activity is formed as a challenge; professional growth is determined by a high level of aspirations; ingenuity, constant search, a wealth of ideas, if they are in demand, can compensate for the lack of

material rewards; often makes a career seem like a productive activity; enthusiastically takes on any task, makes unimaginable plans, holds meetings; promises a lot, but keeping promises is associated with emotional discomfort; Frequent job changes are a hallmark of hyperthymia.

5.4. *Stressful situations for hyperthymia*: conditions of paradoxical communication (in a system of uncertain relationships, roles); a strictly regulated system of relations; monotonous activity in conditions of sensory hunger; forced loneliness; restriction of physical activity; lack of competition; careful, painstaking work; frustration of the need for self-realization; work in conditions of externally imposed activities; activity restrictions; a situation of personal responsibility, control over execution.

5.5. *Typical ways of coping with stress for hyperthymia*: expanding contacts; fantasizing; desire to increase external stimulation (creativity, choice of unusual risky decisions, actualization of unrealized opportunities); radical change of activity, search for alternatives; verbal aggression of an impulsive nature.

5.6. *Pathological dynamics of hyperthymic character*: irritability, in extreme severity – vulgarity, rudeness, aggressiveness; lack of criticism of one’s own condition, one’s own activities; reasoning; tendency to deviate.

5.7. *Examples of questions to identify hyperthymic accentuation of character during an express conversation: positive answers to questions like*: 1) “Is your mood generally cheerful and carefree?”, 2) “Are you enterprising?”, 3) “Is it difficult for you to go on for a long time?” time to sit on a chair?”, 4) “Are you suitable for entertaining events?”, 5) “Can you say that when you fail, you do not lose your sense of humor?”, 6) “Do you like organizational work?”, 7) “Can you be called a lively and lively person?”, 8) “Does your mood easily rise in a friendly company?”

(6). Dysthymic accentuation means that persons with this accentuation of character are serious and usually focused on the gloomy, sad aspects of life to a much greater extent than on the joyful ones. In society, dysthymic people almost do not participate in conversation, only occasionally inserting remarks after long pauses. Their circle of social contacts is limited. Possessing highly developed reflexive processes, in reasoning (most often monologues) they constantly try to establish causal (cause-and-effect) connections. They are characterized by low motor activity. However, they show extraordinary intellectual activity. Highly emotional, anxious, suspicious (that is, they tend to see danger where there is objectively none). They have high self-esteem and a high level of aspirations. People of this type adapt very slowly to new conditions. They prefer a constant, regulated lifestyle and activities that are familiar to them, and only in this case can they achieve significant success, because They take any business very seriously and responsibly. In contrast to the depressive symptom complex (short or long), which is perceived by the individual as a distortion of the emotional sphere, the dysthymic character trait is a normal and stable way of human behavior in society.

6.1. *Socially adaptive traits of the dysthymic type*: high erudition; developed ethical values and norms; having your own position, point of view; independence in judgment; even tone of emotional relationships; non-standard type of thinking, not susceptible to the influence of external stereotypes.

6.2. *Maladaptive features of the dysthymic type*: lack of practical skills, physical dexterity, predominance of theoretical knowledge; timidity, pessimism, indecisiveness, passivity; intolerance to intense stimulation in the form of sharp, loud sounds, strong lighting, noisy companies; poor tolerance to emotional and physical stress; activity is impossible in conditions requiring rapid switching of mental processes; rapid fatigue in the motor sphere.

6.3. *Professional characteristics of a dysthymic personality*: in professional activities, dysthymic accentuators choose the most energy-saving tactics, are non-conflict, give the impression of worldly philosophers, are always calm and balanced. The initiative is aimed at achieving maximum impact with minimal effort. Responsibility is determined by job description. Activity is always individualized, isolated, and predictable. The possibility of inclusion in joint activities is considered on specially agreed conditions.

6.4. *Stressful situations for a dysthymic accentuator*: situations related to the implementation of practical skills; decision-making situations; situations related to responsibility for other (not close) people; situations requiring rapid switching of mental processes.

6.5. *Typical ways of coping with stress for a dysthymic person*: fantasizing; rationalization; distancing; verbal indirect aggression.

6.6. *Pathological dynamics of dysthymic character*: dependent behavior; autism.

6.7. *Examples of questions to identify dysthymic accentuation of character during an express conversation*: persons with dysthymic character give positive answers to questions like: 1) "Are you a serious person?", 2) "Have you ever had a hysterical attack or exhaustion of the nervous system before?", 3) "Do you take life hard?", 4) "Do you look at the future pessimistically?", 5) "In conversation, do you prefer to remain silent?"; negative answers to questions like: "Are you talkative?"

(7). Anxious accentuation (anxious-fearful type) of character means that the subject is characterized by receptivity, vulnerability, and friendliness (mainly in a closed circle of well-known people). They are overly self-critical and responsible. They rarely enter into conflicts, playing a mostly passive role in them. They strive for emotional comfort. In a new, uncertain situation, pronounced panic reactions immediately develop, manifesting themselves in behavior at the vegetative level. Excessively neat and punctual. Monotonous, simple work is performed with special care, rechecking it many times. In general, they lack basic trust in the

world. Self-esteem is low. Reflexive processes are hypertrophied. Only sometimes can impulsive determination be observed as a reaction to strong fear.

7.1. *Socially adaptive traits of an anxious personality*: high sensitivity to changes in society; high responsibility; sensitivity to praise; strict adherence to norms (rules); the desire to perform simple, monotonous, predictable operations that are not associated with emotional stress; the desire to resolve conflicts at any cost; sacrifice.

7.2. *Maladaptive features of an anxious personality*: a feeling of helplessness, powerlessness in the face of external factors; with severe stress – immediate general disorganization of activity, disruption of its direction and productivity; vulnerability; extreme indecisiveness; low self-esteem; low stress resistance; constant doubts (in oneself, in one's judgments, actions).

7.3. *Professional characteristics of an anxious personality*: in professional activities, persons of an anxious type achieve great success in almost any activity due to developed criticality, constant uncertainty about the value of their achievements; the desire for constant self-improvement is the leading, motive-forming function of anxiety. Many achievements are formed according to the type of over-compensation.

7.4. *Stressful situations for an anxious person*: unfamiliar social circle; the need for public speaking; the need to make a decision in conditions of a lack of information and time limits; loneliness.

7.5. *Typical ways of coping with stress in an anxious person*: somatization of stress (vegetative reactions, withdrawal from illness); all types of psychological defenses.

7.6. *Pathological dynamics of the character of an anxious personality*: neurotic reactions; anxious personality disorder.

7.7. *Examples of questions to identify anxious accentuation of character during an express conversation: persons with anxiety give positive answers to questions like*: 1) “Did you experience fear of thunderstorms or dogs as a child?”, 2) “Did you experience fear in childhood when were left alone in the apartment? go to the cemetery at night?”, 6) “Are you fearful?”, 7) “Do you often have scary dreams?”, negative answers to questions like: “Do you consider yourself more courageous than in childhood?”

(8). Exalted accentuation means that the subject is sociable, talkative, amorous, has a developed imagination, aesthetic taste, and is a masterly debater. Exaltants react violently to various life situations, they equally easily become delighted with joyful events and despair with sad ones. Mood changes throughout the day. Mood fluctuations play a significant role in the formation of motivation and decision-making situations. Performance, self-esteem, self-attitude depend on the current mood. They avoid responsibility and leadership. The principles and tactics of

their life are unstable. Forecasts are often intuitive, unmotivated, and activities are always emotionally charged. Their exaltation is only to a small extent connected with their egoistic aspirations; much more often they are guided by altruistic motives; they are sensitive and impressionable, attentive and attached to friends and loved ones, and have a sense of compassion. Possessing good taste, brightness and sincerity in the expression of feelings, people with traits of this type of character can achieve good results in various types of art. The rate of growth of emotional reactions and their external manifestations are characterized by great intensity. The impulsive activity of these individuals is associated with altruistic motives. Constant changes in mood, a feeling of “anxiety and happiness” serve as the basis for difficulties in self-representation. Delight, indignation, pity, hatred - all shades of feelings appear in an exaggerated form. Excessive emotionality is combined with vegetative lability: they blush easily, turn pale, heart rate and arterial tone change. Facial expressions always correspond to the current mood. They are unable to hide their feelings.

8.1. *Socially adaptive traits of an exaltant*: sociability, good nature, sincerity, sensitivity during periods of high spirits; high emotional regulation of activity; high plasticity, speed of mental processes; helpfulness.

8.2. *Maladaptive features of the exaltant*: the impossibility of a long-term forecast of activity; indifference to the future; desire to change impressions, decisions, attitudes; avoidance of difficulties; irritability; hot temper, impatience; alarmism; dependence on mood changes; weakened self-control; tendency to conflict, pugnacity; rapid, inadequate change of role positions: during a conversation he can become offended and angry without explanation or apparent reason; fantasy; unreliability in communication.

8.3. *Professional characteristics of an exaltant*: sincerity in expressing feelings, a subtle sense of reality, the desire to romanticize relationships give sophistication and a special meaning to interpersonal communication in any team. However, performing activities, regulated conditions, dependence on one's own mood, subjectivity and peremptory judgments of these individuals create a favorable background for the development of indirect conflict situations and induce panic moods (that is, they can be alarmists). Small victories cause a storm of delight; any failure can “incapacitate”. The developed professional skills can partially compensate for the problems that the person himself experiences. Being an emotional and aesthetic leader in the group, he does not show any inclination towards formal leadership and does not take responsibility. The age and gender determinations of the exalted trait are clearly expressed.

8.4. *Stressful situations for an exaltant*: lack of compliance with subjective expectations; strict consistency, regulation of activities; presence of interference in activities; responsibility, high demands; time limit; lack of communication.

8.5. *Typical ways of coping with stress for an exalted*: verbal aggression; “escape”, escape from reality; negation; somatization of stress (withdrawal into illness).

8.6. *Pathological dynamics of the exalted character*: addictive (dependent) behavior; psychosomatic disorders.

8.7. *Examples of questions to identify exaltation during an express conversation*: persons with exalted accentuation of character give positive answers to questions like: 1) “Can you become very inspired?”, 2) “Can you sometimes be completely imbued with a feeling of joy?”, 3) “If you are disappointed with something, will you despair?”, 4) “Can your mood change from the highest joy to deep melancholy in a short period of time?”

(9). Emotive accentuation of character means that the subject is characterized by emotionality, sensitivity, anxiety, talkativeness, timidity, and deep reactions in the area of subtle feelings. The most strongly expressed trait is humanity, empathy for other people or animals, responsiveness, kindness, and rejoicing at the successes of others. They are impressionable, tearful, and take any life events more seriously than other people. Teenagers react strongly to scenes from films where someone is in danger; a scene of violence can cause them a strong shock that will not be forgotten for a long time and can disturb their sleep. They rarely enter into conflicts, they carry grievances within themselves and do not “splash” out. They are characterized by a heightened sense of duty and diligence. They take care of nature, love to grow plants and care for animals.

People of the emotive type have a developed “ethical” complex. They are characterized by compassion, sensitivity, and a heightened sense of justice. They have developed perceptual and reflective processes. They are emotionally sensitive and impressionable in all areas of life, but especially in communication. They make high moral demands not only on themselves, but also on others. Often they choose complex activities. Possessing a heightened sense of duty, responsibility and diligence, they can achieve good results in their activities (usually in the humanities and arts). People of the emotive type do not like large, noisy, gambling companies, but, as a rule, prefer communication in a narrow circle of close people who are understood perfectly.

9.1. *Socially adaptive traits of an emotive personality*: developed empathy (“the ability to try on the skin of another”); high personal discipline; self-criticism; high efficiency; developed deep, sincere feelings; developed aesthetic taste; as a rule, the absence of a tendency to deviant behavior.

9.2. *Maladaptive features of an emotive personality*: vulnerability; suspiciousness (i.e. the desire to see danger where there is objectively none); tendency to long-term experience of affect; confusion in difficult situations; painful touchiness; intolerance to a wide circle of communication.

9.3. *In their professional activities, individuals of the emotive type are distinguished by a desire for emotional comfort, a constant desire for self-education, and aesthetic development.* Their characteristic sense of duty and responsibility, based on value orientations, forms the moral climate in the team and is an ethical standard in professional activity.

9.4. *Stressful situations for an emotive personality:* a situation that questions the ethical values of the individual; situation of conflict of motives; a situation that activates antisocial behavior of others; public speaking situation.

9.5. *Typical ways of coping with stress for an emotive personality:* contact with animals, nature.

9.6. *Pathological dynamics of the character of an emotive personality:* neurotic reactions.

9.7. *Examples of questions to identify emotive accentuation of character during an express conversation:* persons with emotive accentuation of character give positive answers to questions like: 1) "Have you ever cried quickly?", 2) "Are you a kind-hearted person?", 3) "Does the sight of blood affect you?", 4) "Do you love animals?", 5) "Can you be so captivated by a movie that tears come to your eyes?", 6) "Can you be called a passionate lover of nature?", 7) "Are you very worried if grief happened to another person?", negative answers to questions like: "Could you kill a person?", 2) "Could you kill an animal?"

(10). Cycloid accentuation of character means that the subject experiences frequent and sudden changes in mood depending on external circumstances or for internal reasons, and the reasons for a change in mood can be the most insignificant. During the period of spiritual uplift, they behave like people with hyperthymic accentuation of character (they are sociable, with rich facial expressions, intellectually active), while during the period of decline, they behave like dysthymic people (closed, passive). The duration of each phase can vary from several hours and days to several years. Compared to the exalted type of character (high intensity, short duration, rapid increase in reactions), the cycloid type is characterized by a smaller amplitude and a larger time spread. The duration of the phase ranges from several weeks to several months. Sometimes the phases are seasonal: hyperthymic periods are observed in summer and autumn, dysthymic periods in winter and spring. With aging, mood changes occur less and less often, and a person acquires the traits of any one type, often dysthymic. An important factor is the presence of an adequate, successful model of behavior both in the hyperthymic phase and in the dysthymic phase.

10.1. *Socially adaptive traits of the cycloid personality:* in the hyperthymic phase - initiative, cheerfulness, sociability; in the dysthymic phase - prudence, thoughtfulness.

10.2. *Maladaptive traits of a cycloid personality:* lack of consistency and logic in making and implementing decisions; inconsistency in decisions and assess-

ments (“seven Fridays of the week”), the content of the decision is determined by the phase (hyperthymic or dysthymic) in which they are “here and now”; outbursts of irritability, touchiness, pickiness; inadequate reactions to criticism; paradoxical emotional reactions; role ambiguity; unstable self-esteem; unmotivated actions; isolation, passivity; panic reactions to changes in one’s own social position.

10.3. Professional characteristics of a cycloid personality: in professional activities it is necessary to carry out diagnostic and corrective measures. As a rule, an individual can productively model and implement one of the phases. The onset of another confuses him and causes panic. Thus, with age, the dysthymic phase lengthens, and the implementation of hyperthymic programs is difficult. However, the hyperthymic behavioral programs that have developed in an individual continue to influence the motivational sphere and the level of aspirations.

10.4. Stressful situations for a cycloid personality: emotional rejection from significant others; separation from loved ones; infringement of self-esteem; competition conditions; a situation requiring long-term maintenance of the level of performance; impossibility of implementing previously predicted and feasible programs.

10.5. Typical ways of coping with stress for a cycloid: rationalization; negation; search for new adaptive forms of behavior that allow one to realize oneself most fully and productively.

10.6. Pathological dynamics of the character of the cycloid: aggressive, conflict behavior; depression; depersonalization; dependent behavior.

10.7. Examples of questions to identify cycloid accentuation of character during an express conversation: persons with cycloid character give positive answers to questions like: 1) “Can your mood change from deep joy to deep sadness?”, 2) “Does your mood strongly depend on life events and experiences?”, 3) “Do you often change your mood for no reason?”, 4) “Do you think that your mood depends on the weather?”, 5) “Have you ever gone to bed in a good mood, but woke up in a dejected and remain there for several days?”, 6) “Does it ever happen that you feel in “seventh heaven”, although there are no objective reasons for this?”

Examples of questions to determine the sincerity of answers during an express conversation. At the conclusion, we will give examples of questions that will help the detective conducting the interview to quickly assess during the conversation how sincere the interviewee is with him.

Markers of lies are positive answers to questions like: 1) “Do you always cross the street when the traffic light is green?”, 2) “Do you always listen carefully to your interlocutor, no matter who he is?”, 3) “At home, do you behave like this at the table?” the same as when visiting?”, 4) “Are you always willing to admit your mistakes?”, 5) “Have you never felt antipathy towards anyone?”, 6) “Are all the people you know attractive?”, 7) “Are you Always pay close attention to

how you dress?” - and negative answers to questions like: 1) “Do you sometimes gossip?”, 2) “Has it ever happened that you took advantage of another person’s mistake?”, 3) “Have there been times when you were jealous of the luck of others?”, 4) “When people are in trouble, I sometimes think that they got what they deserved?”, 5) “Can you sometimes speak ill of those who are absent?”

Thus, the theory of character accentuations allows for diagnosis, analysis, prognosis and management of human behavior.

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数字时代的教育技术：优点和缺点
**EDUCATIONAL TECHNOLOGIES IN THE DIGITAL AGE:
PROS AND CONS**

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Introduction. Modern education is moving to a new level, which makes it possible to involve a large number of people in the process. The purpose of the article is to highlight important issues associated with traditional and distance learning. This is very important in the professional training of students in various fields, in obtaining professional knowledge that needs to be consolidated in practice. Using the method of comparison and grouping, the study analyzed a series of surveys of 180 students aged 17-35 years, as well as a survey of 150 teachers. The obtained material gives important results that are applicable in the practice of working with university students. Creating the necessary and safe conditions for student learning, as well as more active use of Internet resources. This problem is very relevant for teachers and students of foreign countries and for Russia.

Goal: to analyze the experience of teaching higher education students on the example of local and foreign specialists, as well as the work of the Medical University, to present the main forms of traditional and distance education technologies, its problems and their solutions.

The issue of learning technologies is presented by modern specialists as a set of teaching methods and knowledge acquisition, in addition to technical and information learning tools to make content and methods interrelated and interdependent. According to M.V. Plaksina, "Since the mid-1950s, a new technological approach to the construction of the educational process has appeared, it was from this period of time that the new concept of "teaching technology" entered pedagogy, and it was associated with the use of technical teaching aids. Along with the concept of "learning technology", such concepts as "pedagogical technology"

and “educational technology” are also used. Moreover, a clear distinction between them has not yet been established either” [8, p.10].

Teaching technologies are quite relevant in connection with the current conditions. The pandemic has had a strong impact on higher education, universities have switched to distance learning, and as a result, the use of distance learning technologies has been developed. In Russia, platforms have been created for distance learning and the digital educational environment, as indicated in the national project “Education”, on which the information and communicative competences of students are formed. Social networks allow to bring together a huge number of people from different countries, from different parts of the world. The implementation of new information and educational technologies, the use of progressive forms of organization of the educational process and active teaching methods are now considered as the criteria for education in the 21st century.

New technologies in education are reflected in the works of local and foreign researchers. In William G. Bowen’s “Higher Education in the Digital Age”, many important criteria for digital education were identified: a need for reliable platforms, a new way of thinking and fresh ideas [1, p.36]. An analysis of the current situation has shown that the availability of effective online platforms and their accessibility is one of the important aspects of online learning.

The volume and dynamics of the online education market indicate that the development of information technology has a fairly large impact on the education system, for which there is a significant solvent demand that keeps growing. As practice shows, many countries are actively introducing new training systems into their work. In Russia, according to various estimates, the volume of the online education market is 17–25%. In 2016, it was estimated at 20.7 billion rubles (slightly more than 1% of the entire Russian education market), by 2021 it was predicted to increase its share to 2.6%, and in absolute terms, the market volume is forecast to grow to 53.3 billion rubles [5, p. 412]. In this regard, work with foreign students is quite relevant for universities.

Chinese experts analyzed the statistics of the country’s universities and found that traditional teaching methods have become a problem that needs to be solved in order for China’s higher education to remain competitive in the new era. They identified students’ weak independent work skills due to the pandemic and remote learning and concluded that maintaining competitiveness in the current situation makes a combination of online and offline learning the norm [8, p.202].

The problems of adapting learning to new conditions are shown in the publications of many specialists. “A big problem is the inability of teachers to adapt the education of the past to the future, which is already there, especially with drastic climate changes and pandemics.” University professors who work on online courses, according to Giancarlo De Agostini, have been found to face a significant

“dilemma” of transferring and extrapolating different curricula, programs, teaching ideas, messages, collaborative activities and concepts from face-to-face learning. [4, p.3].

The study of the experience of foreign and domestic experts reveals the inconsistency and uncertainty in the views on learning with the use of information and communication technologies. This is due to the lack of developed technical skills of trainees in computer management, limited access to the Internet in a number of Asian and African states; the difference in time zones between different continents, the use of different programs, the level of preparedness of teachers and their creative approach to this problem.

In Cuba, distance education is part of the educational strategy. In an online environment, the question of education becomes more complex as learning and knowledge generation are carried out in different ways due to a different level of training of students, the conditions of classes, the availability of computers. As online professors build relationships between students and engage in non-traditional but authentic learning, according to Maylen Dumenigo Rodriguez and her colleagues, they must take a high responsibility for learning outcomes and step up the process. Studies have shown the following results of distance learning: reading comprehension is 38.7%, vocabulary acquisition is 50.3%, and reading motivation is 8.2%. [6, p.2].

One of the factors influencing the successful solution to this problem is the ability and readiness of teachers to work in a crisis. This concerns the methods and techniques of teaching, the manner of communication, explanation, features of the applied design technologies. To work successfully, advanced training courses were needed to work in a remote format. This was necessary to solve a number of problems: search and selection of Internet resources for educational purposes; evaluation of the selected information; the use of information and reference materials and Web technologies in the learning process; online tests and Internet services to monitor the progress of students. The creation of online training programs was meant to solve professional problems in accordance with the profile orientation of the university. The use of information and communication technologies in the educational process of foreign students led to the development of new areas and forms of education [3, p.5]. A large number of created programs in various areas and specialties makes it possible to use the most effective and useful learning tools, create educational content that meets the needs and interests of learning for various categories of students. Existing educational platforms allow students to complete tasks remotely, take tests, and allow communication between the teacher and students.

A necessary condition for distance learning is access to the Internet, with which there were difficulties in some regions, primarily due to a lack of reliable

internet connection and access to digital devices. The experience of teachers at the Northern State Medical University has shown that the quality of the equipment that hosts information resources and the amount of transmitted information are the weakest links in online learning at the present time. In accordance with the concept of the Federal Target Program, the Northern State Medical University began to actively implement information and communication technologies (ICT) into the practice of working with Russian and foreign students on the main platforms, when a large number of foreign students left Russia and stayed at home.

The development of digital education, the formation of ICT competencies of students requires the solution of several tasks. Significant difficulties are presented by the need to adapt students to the conditions of organizing the educational process. Working in a pandemic has shown that many students are not ready for distance learning. Some of them don't have a sufficient level of basic training, motivation, individual learning ability, some of them don't have a comfortable place to study at home, don't have a fast Internet connection, don't have desktop computers or laptops, some can communicate with the teacher only by phone. Students from India and Thailand struggled to adapt to learning in new, unusual conditions for them [2, p. 84]. In a difficult situation, the university managed to solve the problems of technological equipment and training of teachers for online learning.

Teachers emphasize that the organization of remote and independent work of students causes great difficulties. In addition, attention should be paid to the peculiarities of students' adaptation to new working conditions, to the formation of motivation. By using information technology, students solve various problems: intellectual development, self-expression, interpersonal communication, satisfaction of emotive needs. Teachers should implement various information resources into their work practice, develop distance courses and create an effective learning environment. At the same time, it should be remembered that most students have extensive experience in the use of digital technologies, however, with wide access to gadgets, they experience difficulties in using digital technologies in an educational context, as they often do not have high-quality equipment and high-quality Internet connection. Empirical research shows that there should be an emphasis on discursive learning, a culture of using social networks that create and provide opportunities for successful work and promote effective learning in the digital age.

The productivity of teachers is determined by many factors. Nigerian researchers conducted a survey of school teachers with 643 respondents from three senatorial districts in Oyo State. The results showed that the level of teacher productivity has always been high, however, in order to improve the efficiency and quality of work, particular attention should be paid to active learning in digital technologies and the implementation of digital leadership [10, p.3].

Digital forms of work help to rethink the basic principles of the organization of education, allow to establish more trusting relationships for cooperation, find

creative solutions to a number of problems, encourage teachers to master new forms of work, while actively helping them and stimulating the desire to learn and try new tools, as educators actively cooperate between themselves. In «Questionable Assumptions About ‘Moving Online’ in Response to COVID19 and Some Practical Advice», colleagues from the University of Edinburgh offered valuable practical advice on online learning:

Think about what you are trying to achieve, what tools and resources are available, and how you can get students to engage with them as simply as possible.

At the same time, try to keep things simple. Where possible, use the tools that are already familiar to you and students.

Go low-tech where possible and allow alternative ways of working when not connected.

Do not assume all students will have stable connectivity, access to good quality or large screen devices, or even a quiet environment in which to work.

It's possible to produce short workbooks that support the completion of an assignment and can be downloaded and printed [9, p. 83].

Massachusetts Institute of Technology has developed specialized online courses in various disciplines (medicine, geography, mathematics, chemistry, information technology), including English, with a large arsenal of videos, interactive tasks, forums, chats for discussion, and implemented distance learning in all disciplines depending on the native language of foreign students.

Teachers provide methodological support to each other in the use of digital technologies, post current training courses on various platforms for free, use electronic presentations that allow to reveal the essence of the studied topics more clearly through diagrams, graphs, drawings and multimedia models, post video lectures on the Internet that will be in demand for individual work.

According to Euronews, students are affected by a lack of face-to-face interaction, and lecturers find it difficult to lecture without knowing the students' reaction. As a result, the higher education system is experiencing serious difficulties, its participants feel demoralized [7].

Medical school students studied remotely for five semesters during the pandemic. Without exception, all senior students expressed dissatisfaction with the practical part of their training, namely the lack of practice at clinical sites, without which the formation of professional competencies is not possible. Students are not present on rounds, do not have the opportunity to communicate with real patients, and do not have communication with native speakers [2]. A number of students spoke about problems associated with access to educational materials posted online. 42% of 6th year students are dissatisfied with the organization of distance learning at the university. There are problems with Internet access and low speed in dormitories. When preparing for classes, the majority of respondents (98.2%)

use Internet resources and lecture material (54.6%), as well as textbooks (51.7%). Everyone uses materials from the electronic platform, while the majority of first-year students (73%) note difficulties in understanding electronic lectures.

The survey results show that students are particularly affected by loneliness and stress. Students believe that online learning is only part of the problem. More depressing is the lack of communication, especially since bars, restaurants and clubs have been closed. They can't even play sports together. According to students, life becomes boring, they are not motivated to follow the curriculum, classroom lectures feel more productive, and lecturers read more enthusiastically when there are real people in front of them.

A survey conducted at the Northern State Medical University among teachers and foreign students revealed the same problems. 84% indicated problems with the Internet, 75% of students noted that they experienced stress due to the new conditions of study at the university. 93% of students admitted that they feel uncomfortable studying online, noting that the quality of education is significantly improved when combining classroom and online classes. 39% noted the inability to study by phone. Students miss teachers and familiar learning environments, face-to-face classes with real teachers and student friends. 67% indicated the restriction of communication. One of the most important components of university life, in their opinion, is meetings and social activity. It should be concluded that digital and interactive mechanics must be implemented into the educational process, but they shouldn't replace traditional forms of education. At the same time, it was found that not only students are affected.

A survey showed that 82% of teachers suffer from exhaustion, 74% struggle to maintain a healthy lifestyle due to lack of time, 66% indicated an exacerbation of occupational diseases, 86% miss real classes and note depression, worsening financial situation.

The most successful universities have formed online communities for students, teachers, and administrators, which has contributed to improving the quality of education and reducing the stress of social isolation. European universities have created a specialized fund to support poor students and stimulate the work of teachers. Analyzing modern content on this issue, teachers of the Medical University are actively involved in the coordination of distance and traditional learning technologies. New teaching aids, communication techniques, working groups, individual forms of teacher-student communication on various convenient media have been developed, and active work is underway to intensify learning [WORKBOOK IN PATHOLOGICAL PHYSIOLOGY FOR FOREIGN STUDENTS OF MD-PROGRAM, WORKBOOK ON DISCIPLINE MICROBIOLOGY, VIROLOGY, RUSSIAN LANGUAGE AND SPEECH CULTURE IN MEDICAL PRACTICE, BUSINESS COMMUNICATIONS]. A new empirical study is planned in the future

Conclusion. The educational process in modern society has changed significantly. In a short time, university teachers learned how to use modern Internet technologies and moved to a new level of teaching. As a result, it should be concluded that high-quality distance learning can provide effective search, analysis, processing and transmission of the necessary information using information technology, including solving professional problems when combining classroom and online classes. It can be assumed that due to the current situation, quality online courses will attract more attention to themselves in order to successfully compete for the best national students, and even more so for the best international students, universities will have to continuously improve their quality of education.

Literature

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不同知识领域学生移动技能发展的具体情况

THE SPECIFICS OF THE DEVELOPMENT OF STUDENTS' MOBILE SKILLS IN DIFFERENT FIELDS OF KNOWLEDGE

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抽象的。 在专业活动的市场条件下,专家快速适应不断变化的工作条件和社会生活的能力是相关的。 足够的能力应该成为在大学互动学习环境中培养学生移动技能的主题。 教学系统中的移动自组织技能具有控制论和协同特性,因为教学过程是人为创建的系统,具有预期的结果,但学生和教师之间的互动以及教育内容具有意外和不可预测的性质。 本文分析了不同学科领域交互技术中学生移动自组织技能发展的具体情况。 开发学生移动自组织技能的技术将有助于让学生参与他们正在学习的知识和自身发展。

关键词: 自组织, 互动教育环境, 移动自组织技能, 学生在教育内容中的意义。

Abstract. In the market conditions of professional activity, the ability of specialists to quickly adapt to constantly changing working conditions and social life is relevant. Adequate abilities should be the subject of developing students' mobile skills in the interactive learning environment of the university. Mobile self-organization skills in pedagogical systems have both cybernetic and synergetic properties, since pedagogical processes are artificially created systems with an expected result, but with an unexpected and unpredictable nature of interaction between students and teachers and the content of education. The article analyzes the specifics of the development of mobile self-organization skills of students in interactive technologies in different areas of academic disciplines. The developed technologies for developing students' mobile self-organization skills will help make students involved in the knowledge they are learning and their own development.

Keywords: self-organization, interactive educational environment, mobile self-organization skills, students' meanings in the content of education.

In the context of the reorientation of the goals of professional education from students' assimilation of knowledge to the preparation of a mobile specialist, the development of students' skills in self-organization of educational activities is becoming one of the leading trends in rethinking the educational process in higher education. Self-organization in its traditional presentation is expressed in students' abilities to clearly plan, organize and regulate their mental and practical activities in the educational process.

At the same time, it should be noted that the ability of self-organization of students in pedagogical systems has both cybernetic and synergetic properties, since they are artificially created systems with both the expected result and the unexpected and unpredictable nature of students' thought processes, relationships and behavior. Such interaction, in addition, depends both on the goals of the students, and on the content and methods of educational activities, on the scientific field and content of the discipline being studied. And since the content of academic disciplines remains stable for a long time, it is necessary to make innovative methods, means and technologies of the educational process. The content of any academic subject contains directions, instructions, instructions, and samples of actions that should help students rationally organize their mental actions. Thus, in mathematics, strict algorithms of mental actions are proposed in the form of analysis, synthesis, abstraction, generalization, induction, deduction, analogy, etc. to solve the problems [8]. When working with the text of a work of art, the following methods are proposed: problem-thematic, analytical, interpretive, research, intertextual, integrated, synthetic [10, p. 10.]. In the disciplines of the natural cycle, the skills of observation, thought experiment, knowledge verification, modeling, comparison, and generalization are designated as methods of self-organization in an empirical approach [13]. In the field of sports disciplines, the skills of initiative, courage, determination, overcoming difficulties, perseverance, and the desire to win are highlighted. In particular, in martial arts, the psychological attitude comes first, including faith in victory, calmness, concentration, breathing, distribution of forces and reaction; in technical terms, dynamic and selective balance and selective interaction, as well as speed, sharpness, surprise are recommended reactions and actions [2;11]. Accordingly, in traditional teaching with a cybernetic approach, self-organization consists of developing in students the ability to quickly and accurately perform specified actions in educational activities. This approach does not affect the internal reserves, initiative and ability of students to self-organize, and therefore they remain uninvolved in knowledge and methods of studying it and cannot assess the changes occurring in themselves under the influence of educa-

tional technologies [3]. At the same time, the emphasis on developing the mobility of students' skills moves to the area of a synergetic approach to self-organization.

Regarding the possibilities of the relationship between students' self-organization as a personal property, mobile actions and the direction of their professional training, the scientific positions of researchers differ. Thus, in the cultural concept of educational organization, self-organization is interpreted through the formation of methodological skills, which were subsequently interpreted as universal or meta-subject (I.Ya. Lerner, V.V. Davydov, N.Yu. Gromyko). In this regard, researchers believe that the level of formation of self-organization components does not depend on the training profile [5;7]. Researcher A.V. Blokhina, agreeing with this position of scientists, connects self-organization with the synergetic characteristics of the pedagogical process and proposes to distinguish "chaos", "bifurcation" and "order" in it as three stages of the development of mobile skills [1].

However, representatives of the synergetic approach also consider self-organization to be a process of ordering elements of the same level in a system due to internal factors, without external specific influence [12]. This understanding of self-organization cannot be directly applied to pedagogical systems, since they are artificially and purposefully created systems with predictable results. In this connection, in pedagogical systems, self-organization acts as an integrative, purposeful process, during which the organization of a complex dynamic system is created, reproduced or improved [9]. Accordingly, pedagogical systems require both an external and an internal authority that stimulates instability and supports the process of becoming stable, ordering and interaction of elements of self-organization.

Scientific and methodological searches for the development of mobile self-organization skills of teachers and students based on identified trends in the organization of interactive educational technologies within the framework of our research have been conducted for a number of years at the Center for Modern Educational Technologies of the Dagestan State University. The Center develops, tests and recommends for implementation in the educational process various aspects of developing students' self-organization skills in the learning process. All of them are associated with the creation of an interactive educational environment in the educational process, which allows maximum disclosure of the resources of students' intentions in their self-organization. The methodology for developing interactive technologies included several stages. At the initial stage, the research group put forward a number of ideas about realizing the potential of interactive technologies in developing students' self-organization skills and presented them to a group of proactive teachers to develop different forms of educational activities. After the teachers selected an approximate idea and a hypothesis for its implementation, they, with the help of the staff of the Center for Modern Educational Technologies,

developed the technology itself, including an unexpected name, relevance, new idea, necessary teaching tools, exemplary procedures and recommendations for use. They tested the developed technology at a seminar with teachers. After approval at the seminar, the technology was carried out in a student classroom in the presence of faculty methodologists. After repeatedly practicing the skill of using the technology before introducing it into the educational process, teachers demonstrated their technologies in the form of master classes. To ensure accessibility, many teachers conduct video recordings of master classes with methodological support and comments on the technology techniques used, and they are posted on the university website, on the YouTube Internet channel [6], as well as in the DSU periodical [4]. Using this methodology, within the framework of the project, more than 140 new interactive technologies and recommendations for their use were developed and proposed for implementation in the educational process in order to develop mobile self-organization skills of teachers and students.

The developed technologies were classified based on the method of revealing and using the intentions of teachers and students in the process of developing self-organization skills. Based on this, at the next stage, interactive technologies were developed for teachers to demonstrate their intentions and self-organization skills and to stimulate and introduce students to self-organization skills together with the master. For these purposes, the technologies “talking reflection”, “instructive training”, “improvisation training”, “thought experiment”, etc. have been developed, tested and justified.

At the next stage, students were introduced to techniques for identifying the intentions of the values of science and culture and creating their own meaning in them. Technologies of this nature include: “partial search”, “getting used to the writer’s work”, “dialogue of scientific positions”, “semantic association of the text”, “relay dialogue”.

The interactive educational environment allows students to openly present their intentions and mobile self-organization skills. The following technologies are justified for such purposes: “educational debate”, “situational technology”, “simulation design”, “team tournament”, “functional role-playing game”, “carousel discussion”.

In the context of a pandemic, distance learning has become especially relevant and the importance of students’ self-organization skills in their educational activities has increased. In this regard, there was a demand for interactive learning tasks that we developed, which, without direct control over the information used, allow us to update students’ intentions and lead them to self-organization. To do this, educational assignments must include analysis and comparison, establishing an analogy, identifying the essence, highlighting positive and negative aspects, indicating the advantages and disadvantages of methods and ways of studying phenomena

and knowledge about them, analyzing and continuing the started thought with its own meaning, and interpreting knowledge.

The effectiveness of the implementation of the methods was determined by the criteria for identifying the dynamics of the development of self-organization skills in students: the presence of knowledge about intention and self-organization, awareness of the significance of intention in the development of mobile self-organization skills, understanding of the role of intention in the success of educational activities, orientation of intention to the logic and rationality of actions, correct relationships with other students as an indicator of the ability to regulate one's behavior.

Monitoring the dynamics of the development of students' mobile skills through direct observations, selective conversations with teachers and students, connecting students to the functions of experts, assessing assignments completed by students in master classes, as well as testing results allows us to assert that the listed technologies are aimed at creating chaos of thoughts and meanings and contradict traditional algorithms and strictly ordered actions of students' educational activities. But without such a chaos of thoughts emanating from the intention of each student, it is impossible to come to a deep understanding of the knowledge being studied; moreover, they require students to demonstrate mobile self-organization skills. The uniqueness of the project for developing mobile self-organization skills of students is that in an interactive educational environment in different academic disciplines, each new pedagogical situation requires an adequate solution and mobilization of the potential of students' and teachers' intentions. In this case, the educational process becomes a platform for training mobile skills of self-organization as a personal characteristic of successful activity.

The results of the study allow us to draw the following conclusions:

1. The development of mobile self-organization skills in modern professional education is one of the significant trends in the development of higher education.
2. The accumulated experience of rational organization of educational activities in the field of individual academic disciplines in the development of mobile self-organization skills must be integrated with the development of methodological self-organization skills of students.
3. To develop students' mobile self-organization skills, the educational process at a university needs to be restructured using interactive and meaning-creating technologies, in which students learn to observe and evaluate positive changes in their development.

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俄罗斯设计教育体系的形成：主要阶段
**FORMATION OF THE DESIGN EDUCATION SYSTEM IN RUSSIA:
THE MAIN STAGES**

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注解。众所周知，教育是改革最频繁的的制度，培养专门人才必须适应特定历史时期的实际，与时俱进。设计教育也需要进行改革，对其结构和内容进行彻底修改，以便设计大学的毕业生在生产中受到需求，并提高俄罗斯的经济成就水平。这就是设计教育的主要问题：重构教育的结构和内容，以适应现代社会的现实。本文考察了俄罗斯经典设计教育体系一百年发展的形成过程，追溯其形成的主要阶段。显然，不可能将一百多年历史时期所使用的一切有价值 and 重要的东西付诸实践，但评估和反思历史经验和包袱对于现代研究者、教师和学生以及所有从事工作的人来说将是有趣的。在培训设计师领域，自己也是一名实践设计师。笔者将此视为本研究的主要目的和目的。作者将在后续文章中探讨俄罗斯设计教育的发展，并考虑到普遍接受的历史分期。

关键词：设计教育；设计教学方法；宣传培训课程；教学设计理论与实践；VKHUTEMAS；培训高素质专家；设计培训内容。

***Annotation.** It is known that education is the most frequently reformed system, which must adapt to the realities of a particular historical period and keep up with the times when training specialists. Design education is also subject to reform, a radical revision of its structure and content so that graduates of design universities are in demand in production and increase the level of economic achievements in Russia. This is the main problem of design education: restructuring the structure and content of education in order to comply with modern realities of society. The article examines the process of formation of the classical system of design education in Russia over a hundred-year period of development in order to trace the main stages of its formation. It is obvious that it is impossible to put into practice everything valuable and important that was used over a hundred-year historical period, but assessing and rethinking the historical experience and baggage will be interesting for modern researchers, teachers and students, all those who work in the field of training designers and themselves is a practicing designer. The author sees this as the main goal and objective of this study. Further*

articles by the author will examine the development of design education in Russia, taking into account generally accepted historical periodization.

Keywords: *design education; design teaching methods; propaedeutic training course; theory and practice of teaching design; VKHUTEMAS; training of highly qualified specialists; content of design training.*

The design education in Russia has been going through a complex, more than century-long (if you start counting from the actual convergence of the artistic and technical branches of academic sciences that were isolated until a certain point in the higher education system) along the path of reform and reorganization of educational institutions and the pedagogical process. The restructuring of design, in the philosophical and broader sense - creative, constructive, inventive thinking - is a continuous process of collision and interaction of multidirectional scientific views and theories, especially clearly manifested at the change of eras, sharp leaps in development or socio-economic and political crises. Rethinking and reworking of pedagogical concepts in the fields of education, focused on training specialists in demand in these realities, occurs in parallel with external global processes on the foundation of existing and new scientific knowledge, technology development, as well as ideas about the creative potential of the individual in general and the tasks of the designer as a specialist in particular. In the 20s of the last century, clear prerequisites appeared for the formation of a new system of higher design education in Russia and the first pedagogical ideas that were formed under the conditions of the unification of art and architectural educational institutions at the beginning of the 20th century. The transition from academic principles of teaching, associated with the need for specialists for industry (industrial art - design and applied artists - designers) took place under the conditions of the new economic policy. To fulfill the tasks and indicators of mass construction and production, it was necessary to reconsider the existing principles and methods of training professional personnel.

Thus, at the turn of the 19th and 20th centuries, a “classical” theory of design education arose, based on the principles and ideas of the interaction of nature, architectural form, fine art and a spatial environment that is convenient for humans and at the same time fulfills its aesthetic function. In Russia during this period, M.A. Vrubel, who developed a methodology for teaching applied artists, had a great influence on the formation of pedagogical principles. At the same time, the question of introducing propaedeutic courses in art history, style, and drawing into professional training was raised for the first time; indicates the transition to composition and design of the object. In the article we will consider the key points of artistic and architectural pedagogy of the period preceding the formation of VKHUTEMAS, a little later, as an introduction to detailing the main stages of

the development of the design education system. VKHUTEMAS - VKHUTEIN in the 20s of the 20th century, during the economic boom, marked the era of the spontaneous formation of design and the definition of paths in the process of teaching design in Russia in the preparation of highly qualified personnel for industrial sectors. The modernist movement and the emergence of functional and creative approaches to the training of specialists have a significant impact on design education. The key people of that period are A.M. Rodchenko, who developed powerful propaedeutic courses in the discipline “Graphics”, methodological concepts of design, material processing and construction, who introduced a cycle of engineering and technical disciplines; L.M. Lisitsky, N.A. Ladovsky (authors of the “from abstract to concrete” method), who presented the scientific basis for the layout design method - creating sketches of a volumetric-spatial composition. VKHUTEMAS became the first higher school of design education in Russia, the successes and developments of which were recognized internationally [1].

The pedagogical heritage of art and technical workshops was returned in the 60-80-90s, the basic principles of teaching theoretical and practical disciplines passed into modern educational and pedagogical principles and concepts. The purpose of design education at this time was to train artists and instructors, as well as highly qualified management personnel for industrial enterprises and for vocational education institutions that provide professional training for such specialists. For the first time, the idea of a synthesis of sculpture and architecture began to be discussed, and the basic principles of teaching design were outlined: rationality, versatility, mobility and economy. Strict structural requirements for the organization of the process, content and fundamentals of education appeared, replacing the previous academic education system: the unification of types of art, the introduction of compulsory theoretical disciplines, including special ones. A strong connection has emerged between the learning process and production tasks. Now the training of highly qualified specialists for construction and industrial enterprises has become an integral part of the economic order and regulation at the level of the country’s leadership [2]. It is worth noting that the influence of the ideas of the iconic university, which played a significant role in the emergence of the very concept of “design” in Russia, naturally continued after the liquidation of VKHUTEMAS-VKHUTEIN in 1930.

Graduates, teachers and managers trained by the new system began to work not only in architectural bureaus and in production; they also found a place for themselves in the country’s architectural and art universities. In the future, the pedagogical traditions of VKHUTEMAS will be studied in VNIITE, created in 1962, and will be continued in the improved scientific developments of the Soviet Scientific Institute of Design. This period will be called the “second wave” of design development. In the article we will dwell not only on the historical periods

of formation and upsurge, but also the crisis of design and the entire education system in this area in the difficult 1940s for the country. Further development of the concept of design education and attention to issues of personnel training, as well as the formation of the fundamental principles of a systematic approach to training, became possible thanks to an appeal to the historical heritage and work to generalize the existing original experience in the development of industrial design and training for industry. A comprehensive and comprehensive understanding and study of an object as a natural, functional extension of the environment surrounding a person and his harmonious environment gave a new impetus to the development of design ideas. The problems of determining goals, objectives, structure and content, teaching methods and practical training came to the fore. Topics for scientific discussions included issues of creative activity and project work, the role of propaedeutic disciplines in the learning process and their obvious overload in the curriculum, interdisciplinary activities (introduction of sociological, humanitarian and economic cycles of disciplines in all specialties). In the 1950s, various approaches to the professional training of designers coexisted in the educational system of our country, the main ones being humanitarian and systemic-activity [3]. The development of a conceptual approach occurs through the search for artistic and imaginative solutions necessary for the creative completion of tasks and the implementation of any project without any restrictions. All these factors had a huge impact on the content of educational programs, the composition and correlation of artistic, technical, social and humanitarian disciplines in them [4]. Experiments continued in search of new universal teaching methods. At this time, scientific works and manuals for teachers and students are published, reflecting the directions of work and the results of creative rethinking of the ideas of design education: N.N. Volkov "Perception of an object and a drawing", E.I. Ignatiev "Psychology of drawing and painting", F.N. Zinchenko, N.Y. Virgilis "Formation of a visual image", Y.K. Somov "Composition in technology", L.M. Kholmyansky "Layout and graphics in artistic design", B.V. Neshumov, E.D. Shchedrin "Artistic design" [5]. In the 1960s, the period of formation of post-war design began under the auspices of the USSR State Committee for Science and Technology (Resolution of the USSR Council of Ministers "On improving the quality of mechanical engineering products and cultural and household goods through the introduction of artistic design methods" 1962, No. 349). The official document of the highest government body sets tasks for the organization and development of design in individual republics, regions and industries, the development of exemplary design projects is being carried out, an information center in the field of technical aesthetics and ergonomics is being created, the foundations of professional activity are being laid, and a system of training highly qualified personnel is being developed. VNIITE plays a big role in this. Russian organizations in the

field of design are now represented at the international level, in the Council of Design Organizations (ICSID), representatives of the scientific community, professors of the institute and heads of relevant departments take part in conferences on design issues with the opportunity to exchange experiences with foreign specialists. Russian design is being integrated into the world economy and culture. By 1968, a system for training scientific personnel in the specialty “Technical Aesthetics” was formed. By Decree of the Council of Ministers of the USSR No. 821, VNIITE is entrusted with the functions of forecasting and monitoring the consumer properties of mechanical engineering products, household goods, goods for social and cultural purposes, developing projects of inter-industry state standards for product quality, coordinating research work on ergonomics issues, methodological management of the work of design bureaus and groups and departments at enterprises, organizations, ministries and departments. Already in 1976, by resolution of the Central Committee of the CPSU and the Council of Ministers of the USSR No. 1056, the institute was entrusted with the coordination of technical specifications and assessment of the technical level of new types of goods for cultural and household purposes. In 1987, the next resolution of the Council of Ministers of the USSR No. 1248 was issued, which additionally endowed the organization with the functions of developing cross-sectoral design programs and large design projects in the fields of mechanical engineering, consumer goods and environmental objects [6]. In the 1980s, the concept of a system-activity approach came to the fore, based on the student’s independent development of knowledge, skills and abilities, mastery of universal learning activities that contribute to the growth of motivation for learning and orientation in various fields of knowledge. During these years, new scientific works were published in the field of design education, which were the result of a rethinking of the design experience in Russia and the directions of development: I.A. Spichak “Some issues of the relationship between design graphics and artistic and graphic training of design artists (1981), S.A. Garibyan, A.A. Meshchaninov “Production requirements for the training of designers” (1982), V.G. Ioffe “Method of polar samples in artistic design”, V.F. Sidorenko “Model of advanced education” (1986), O.I. Genisaretsky “methodological and humanitarian-artistic problems of design” (1990), E.N. Koveshnikov “Theory and methodology of artistic professional education.” Since the 2000s, the modern stage of development of Russian design education has begun: since that time, the system of professional training of designers has been considered from the point of view of a competency-based approach. Particular attention is paid to the structure and content of professional training of specialists in the field of design (N.P. Kharkovsky, Y.V. Veselova, N.A. Vostrikova, and O.P. Andreeva). The means of developing artistic, design and creative abilities of the individual are studied (I.V. Afanasyeva, T.V. Matveeva, L.E. Shmakova, Y.A. Averkin, S.A.

Murtazina) The professional competencies of design specialists are formed (A.I. Assessorov, M.D. Poltavskaya, I.V. Afanasyeva, Y.M. Bundina, L.M. Takhbatullina, A.I. Kuleshova). There is an introduction and integration of information and communication technologies into the professional training of designers (O.Y. Prudovskaya, O.V. Arefieva, E.A. Malikova, and V.V. Grebennikov) [7].

Thus, using the scientific method of retrospective analysis, which allows us to build the clearest picture of the development of design education and is especially significant for this study, in our article we examined the main ways of development of the modern system of Russian design education, so that, moving along historical milestones, record all the key stages that influenced the structure and content of leading pedagogical concepts. In the course of the study, we identified fairly clear patterns in the development of design thinking and the formation of the design education system in Russia in connection with the development of socio-economic relations and industrial production, scientific and technological progress and the latest technologies.

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体育运动中预防关节病
PREVENTION OF ARTHROSIS IN PHYSICAL EDUCATION AND SPORTS

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抽象的。与体育教育相关的理论和方法致力于恢复与社会化、社会适应相关的丧失功能。对患有严重健康障碍的人进行治疗、心理和教育康复、社会 and 劳动适应。包容性是一个在国外积极发展的过程，在俄罗斯联邦，有健康问题的人的看法也在发生变化，他们被视为社会成员，拥有寻求职业成就、参与公共生活的所有权利。此外，由于他们的健康水平，这些人表现出适度的运动活动。适应性体育文化和运动元素可以完成这项任务。对于经常久坐生活方式的健康人来说，体育活动非常重要。对于康复中的人来说，为了恢复身体、精神、社会形态，提高生活质量，它们更为重要。研究人员认为，对于某些类别的人来说，体育锻炼是回归社会、改善健康最有效的方式。

关键词：适应性、体育文化、康复、现代方法、矫正、功能恢复。

Abstract. *Theory and methodology related to physical education are engaged in the restoration of lost functions associated with socialization, adaptation in society. Therapy, psychological and pedagogical rehabilitation, social and labor adaptation of people who have significant health disorders are carried out. Inclusivity is a process that is actively developing abroad, the perception of people with health problems is also changing in the Russian Federation, they are treated as members of society with all the rights to seek professional fulfillment, to participate in public life. In addition, due to their level of health, such people are shown moderate motor activity. Adaptive physical culture and elements of sports can perform this task. Physical activity is important for a healthy person who often leads a sedentary lifestyle. The more important they are for a person in rehabilitation in order to restore physical, mental, social form, improve the quality of life. Researchers believe that for certain categories of people, physical exercise is the most effective way to return to society, improve health.*

Keywords: *adaptive, physical culture, rehabilitation, modern approaches, correction, restoration of functions.*

In the Russian Federation, rehabilitation with elements of adaptive physical culture is based on the introduction of the very term associated with APE into the scientific conceptual apparatus. P. F. Lesgaft SPbSUPE formed a unique department in the country “Theories and Methods of Adaptive Physical Culture”. The institution already had significant developments in this area of activity. Part-time students with impaired hearing and those who had deviations in the work of the SMA studied there. The teaching staff of the university and other followers of the project were actively involved in studying according to the innovative paradigm: D. F. Mosunov, V. I. Kebkalo (department of swimming), V. P. Zhilenkova (Federation of Physical Education and Sports for the Disabled). Already 30 years ago there was a program “Physical culture and sports for people with disabilities” authored by T.V. Fedorova and L.V. Shapkova, which was joined by many specialists. The institution produced professionals who knew how to work with people with disabilities. Subsequently, there was a need for a separate training program. This is how a course and specialty related to physical activity appeared, intended for people whose health is impaired by illness or injury.

Consequently, adaptive physical education (APE) is understood as general physical education, but adapted to the needs and level of health of people with disabilities.

The purpose of the subject is to increase the level of vitality of people so that they can use the existing potential of physical capabilities associated with physical activity, maintain interest in life, improve its quality, be able to become a full-fledged member of society, and professionally self-determinate.

Thus, the use of APE methods affects not only the physical form, but also the personality of a person, contributes to the disclosure of his creativity, personal growth, and self-development. If a person has willpower and shows strong determination, he can achieve all his goals, despite health limitations. It is necessary to overcome the stereotypes of society and your own in order to return to a full life. Of course, physical exercise is necessary on this path. ROS for people with disabilities is a multicomponent structure. It extends to special forms of physical education, sports, physical activity, physical rehabilitation, and creative physical activity practices.

That is, this is a complex that is aimed at correcting and restoring a whole range of disorders. Accordingly, children with mental and physical disabilities can also benefit from rehabilitation using similar methods [12, 13]. The most important thing in this context is socialization and self-expression of children. Scientists have long found out that movement has a direct connection with psychophysiol-

ogy, the ability to build interpersonal relationships, emotional intelligence, the development of cognitive abilities, and the formation of interest in life.

All types of APE work according to a specific plan and direction. For example, children need to develop the basic elements of physical education. Physical education exercises are suitable for this purpose. Healthy, full-fledged leisure activity is formed by adaptive means of motor recreation. Children with disabilities need exposure to sports in order to demonstrate their physical and mental abilities. Of course, in this context, physical rehabilitation methods that can restore and compensate for lost functions are especially expensive [5].

The complex of adaptive physical education today is the most developed, tested, and effective. The reason for its positive effect is the duration of the course. It is through his means that children get acquainted with physical education. It is worth recalling that this subject is taught in specialized educational institutions and is practiced by all correctional schools. The following can be said about such a discipline. For children with health problems, it is especially important to respect, protect, develop their body, manage it to the fullest, and use all the possibilities that still remain. You need not only motor skills, but also an understanding of the basics of physical education, a number of theoretical knowledge in order to listen to your own body. Children should understand that exercise is a way to improve their lives, integrate into society, and realize their potential. As a result, self-esteem and self-confidence grow, and goals are set that previously could only be dreamed of. For example, a person with disabilities can become an athlete and get the desired profession. A healthy lifestyle is another component of learning.

Physical exercises can be very diverse. Some of them are conducted on a regular basis, as happens in classes at the educational institution. There are children who are accustomed to perform a set of morning exercises in order to gain energy for the whole day and increase activity. Even if this kind of activity is a temporary load, passes as an episode in the child's life, it is no less important. For example, in winter children can use sleds. This is enough to diversify physical education techniques at this time of year. Walking outside the city in good weather is also good for health, including mental health. The lesson program can be individual, specially designed for the child. He can take this course at home or in the hospital. Finally, children can participate in public events organized by various structures. For example, in holidays, competitions, game programs. It is worth noting that not only specialists of the relevant profile can be involved in physical rehabilitation. This can be government and public organizations, both specialized and general. Parents themselves, together with volunteers, can organize events for children. Finally, from a certain point, some disabled children have the motivation to develop, to work on themselves in the physical and intellectual sense. They develop an understanding that without this component, full integration into society will cause difficulties.

The tasks that are solved in the process are related to the activation of the movement of a child with disabilities; he can gain access to sports, spend time interestingly and usefully, develop as a person, find his calling, unlock his potential, and understand how necessary a healthy lifestyle is for a person.

Adaptive recreation is understood as an element of physical activity, which is capable of organizing a good rest and interesting leisure time for a child. Using this method, you can change the type of activity, have fun, feel better, including emotionally, communicate, and achieve some results in creativity. Adaptive physical rehabilitation is understood as an element of physical fitness that helps children with disabilities restore their level of health to the extent possible. This is a therapeutic treatment to restore health using physical education methods. If we talk about body-oriented practices, we mean creative ones that are accessible to children with disabilities. Spiritual activity is important for every person; for a child with a disability it is an opportunity to express himself, to express his feelings through music and movement. Such children can take part in theatrical activities, for example. The therapeutic component of art is well known. It is easy to see that all components of the RFC have their own functionality and focus. Each course is conducted with an assessment of the results achieved. The emotional stress required from a child manifests itself in varying degrees. The methodology and techniques also differ in certain ways. All these tools are needed for people with disabilities to become full members of society.

Statistics show that the health of the new generation is not in the best condition. Therefore, APE methods are useful for the widest groups of children and adolescents. Abroad, elements of adaptive physical education are practiced very widely. It is not always advisable to exempt children from physical activities; on the contrary, they need to create conditions under which they can develop through moderate exercise. This is especially important for a growing organism and an emerging personality.

Specialists of this profile are in demand in various fields of activity. Clinics, hospitals, sanatoriums, rehabilitation centers, leisure and health institutions, specialized educational institutions, and sports clubs are waiting for trained personnel with the necessary competencies, both professional and personal. All mentioned methods of working with disabled people are designed to promote their socialization. As already noted, engaging in APE is important for humans for many reasons. A person learns to measure his potential with the capabilities of average people; he learns the ability to overcome obstacles, not only physical, but also psychological. Only through overcoming is it possible to live a full life if there are significant health problems. This practice teaches you to compensate for lost functions with the help of other systems in the body. This applies to cases where functions are completely absent or seriously impaired. It is worth recalling that in the Russian

Federation a person with a disability is often forced to live in conditions of poorly adapted infrastructure. Therefore, physical activity is necessary, otherwise you will not be able to cope with moving around the city. A person should treat himself as an ordinary member of society. This is why the attitude towards a healthy lifestyle is so important. Disabled people must understand that their contribution is important to society, that their abilities can be useful and useful. Personal development is another factor that motivates a person and encourages action. People with disabilities may strive to obtain a certain education, for which they need to improve intellectually and be psychologically prepared. Efficiency and productivity also have motivating meanings for a person who wants to integrate into society and live an independent life as much as possible.

It is worth noting that the topic of adaptive physical education is not only specialized and medical. On the contrary, it raises many problems from other areas of activity. Suffice it to say that educational and training events and competitions require justification from a legal point of view. Researchers remind about the balance of stress and rest. Disabled athletes should receive supportive care, especially during times of particular physical and mental stress. That is, a person with a disability is vulnerable and requires appropriate supervision if the load approaches the maximum (at sports competitions, for example). Experts regularly offer non-standard practices to restore health. Communication and socialization, as has been repeatedly emphasized, are also the basis for the development of programs and projects to work with people with disabilities. Each new sport mastered by people with disabilities requires reflection and a balanced approach to training.

Exercise can be considered an active recreational activity if a person has a health condition. This is a way to switch them to another activity, to move with pleasure.

Physical rehabilitation today is introducing more and more non-standard practices in the recovery of people with disabilities. The methods imply a combination of bodily and spiritual experience that can awaken independent activity and personality orientation.

We are talking about psychosomatic tools for regulating one's own activities, psychotherapeutic practice. ROS of creative types helps to relieve emotional stress in people with health problems. That is, this is not only an element of self-regulation, self-development, but also self-knowledge. A person learns to control the body, to recognize the limit of his capabilities, which is not as far limited as it seems. However, it is worth noting the following fact. APE and sports are only part of an extensive program for the rehabilitation of persons with disabilities. The socialization of such people occurs at a slow pace; the actions of institutions and organizations are not always coordinated. We should also not forget that this in itself is a large-scale project that accompanies a person for a significant period of his life.

The Federal Law “On Social Protection of Disabled Persons in the Russian Federation” (1995) declares that people with HL should have access to sports infrastructure, and all institutions that carry out rehabilitation work of this kind are supported by the state [10]. The Federal Law “On Physical Culture and Sports in the Russian Federation” is dedicated to physical education, health, and sports events for people with disabilities. It is emphasized that full rehabilitation and socialization are associated with physical health and restoration of functions [11].

Domestic rehabilitation science includes APE as a component of the general methodology and principles on which adaptation is based. According to the first direction, it is especially important to carry out socio-psychological adaptation so that a person learns to communicate, act, interact, and finds himself in one or another social role [1]. These practices are completely verifiable based on their results. One of the main factors is that the person himself be satisfactory for the person, considered a step forward in his life. Self-esteem requires special attention, as does your life plan. The latter, of course, should be realistic. Adaptive physical education, as already mentioned, can contribute to the effectiveness of this stage.

In addition, a person with disabilities needs contact with the world through an objective, social environment. This means a certain level of physiology and behavior is required. Only then will a person truly adapt to the world around him. Physical activity is a way to naturally integrate into society.

Finally, experts pay attention to measures that can compensate or restore function. Physical education has the tools to work in a similar area [1].

APE is a comprehensive program that influences rehabilitation and correctional work with people with disabilities. It is easy to see that within the framework of the direction, the socio-pedagogical functions performed by specialists are especially important [4]:

- preventive measures that can prevent a negative scenario in the development of health problems;
- corrective and compensatory measures that help restore health as much as possible in the current situation;
- educational functions that imply that people with disabilities will study, and possibly work. This is why it is important to develop motor skills;
- educational measures aimed at personal growth, searching for one’s place in life, incentives for development and creating life plans;
- therapeutic, rehabilitation and recreational activities to restore health, increase the body’s resistance, emotional stability;
- socially integrative measures that deal with the integration of a disabled person into the social environment, where he can express himself as an individual, worker, student, etc.;
- communicative training to teach a person with disabilities to build interpersonal relationships with the social environment.

Under these functions and directions there are a number of principles that activate the effectiveness of the APE in this context [1]:

- diagnostics as a tool for determining the degree of impairment and prospects for self-development;
- individual approach to a person and his disease;
- a developmental component, which must be universal and affect the body, psyche, and personality as a whole;
- an age factor that must be combined with the specific course of the patient's disease.

That is, APE is always based on the patient's health status, capabilities, diagnosis, physical fitness, and motivation. In connection with this, the following work is being carried out [9]:

- educational, so that a person can cope with an exacerbation of the disease himself, monitor his condition;
- correctional and developmental, when physical fitness is comprehensively corrected. Motor, sensory, mental functions are practiced;
- wellness, not only to recover from illness, but also to improve immunity and mood in general;
- medical, therapy as a way to restore health, return to a normal lifestyle after an injury, as far as possible;
- sports training activity, when a person with a disability prepares physically, technically, psychologically for competitions;
- recreational work, when active leisure is combined with play elements.

In general, it is not always advisable to divide physical education into areas, because the activity itself, as a rule, is complex. It should be noted that the best result is achieved if a person is motivated and conducts classes at home. Such a person can intuitively organize a set of exercises based on APE techniques. In addition, he can carry out the program of classes proposed by a specialist at home. It must be said that independence should involve consultation with a professional so as not to aggravate the illness or injury.

Specialist Yu.M. Nikolaev believes that the APE is built according to the following system [7]:

- conducting adaptive physical education so that a person with disabilities is aware of the basic concepts and principles of physical education, can determine his level of activity, and normalize workloads based on his state of health;
- the mandatory presence of adaptive motor recreation so that leisure time combines movement with communication and play;
- techniques of adaptive sports, so that a person, if desired, restores his physical, mental, emotional and volitional form in order to participate in sports competitions;

– the presence of physical education rehabilitation, which not only restores, but also compensates for the corresponding functions and capabilities.

As mentioned earlier, various activities can be used as forms. This implies systematicity in classes, participation in active recreation, which is episodic, but beneficial for a person's life. It is important that a person studies at home according to an individual program or resorts to the services of professionals in a hospital. If we talk about mass forms of work, they pursue several goals, including popularizing APE among people with disabilities. In any case, APE is an opportunity to expand your abilities, unlock your potential, learn to lead a healthy lifestyle, learn to relax actively and profitably [6].

A person with disabilities should not feel out of place, fall out of the social and cultural environment, or lose connections with the social environment. It is necessary to adapt the social, psychological, psychophysiological functions of disabled people to existence in the world. A person should not be depressed. Otherwise, additional psychosomatic disorders develop. Emotional instability can be the starting point for the development of concomitant pathologies. All the more important are the APE funds, which are involved in restoring not only physical but also mental health, promoting self-development, self-education, and an optimistic outlook on the world.

There is a combination of medical and physical education aspects. As a result, human life becomes active. As already mentioned, some functions can be replaced and compensated if their restoration is not possible. Accordingly, the psychological state can also be stabilized with the help of physical education and active leisure. It is worth noting that it is especially important for a person to achieve positive results in exercises at the initial stage. Then not only engagement grows, which is obvious, but also optimism. Such people are more willing to undergo rehabilitation. Psychological health is restored through a whole range of measures. It is necessary to compensate not only physical, but also intellectual functions, if necessary. A person needs to be taught techniques that will help reveal the body's hidden reserves and increase emotional stability. Sports and nature are also important health factors that should not be neglected. Body-oriented practice, which turns out to be preferable in a particular case, can renew a person's psychological and emotional strength. For example, a person can engage in artistic creativity. Disabled people must master relaxation techniques and correct not only their physical, but also their psychological form [1].

Consequently, APE is a whole system that includes measures that can correct physical and psychophysical abnormalities. For a person with disabilities, this is a method to successfully integrate into society. APE is an interdisciplinary structure that includes medicine, pedagogy, physical education, and psychology [8].

However, it is worth recalling that the introduction of APE into the life of society faces a number of problems. Disabled people who want to engage in physical

education and sports often face a lack of appropriate facilities in the infrastructure of the locality. We need not just sports facilities, but specialized ones. Sports clubs for the disabled are rare, as are children's and youth sports schools. Institutions specializing in additional education also often do not have the appropriate specialists and equipment.

Professionals in this area are in short supply; the field itself often does not provide decently paid work. In addition, there is a problem that disabled people are not motivated for physical self-improvement, are not ready for the duration of the course, and doubt its benefits for themselves. This means that the promotion of APE is also at an unsatisfactory level. Among people with disabilities, there is an opinion that sports are for healthy people. Of course, moderate loads and physical activity are a way to rehabilitate people with disabilities, which should not be neglected.

Participation in active physical education and sports events is a form of not only health improvement, but also communication with other people. This is the only way to take care of mental balance, get out of isolation, become more confident, purposeful, stress-resistant, and capable of self-control. An active life largely begins with physical activity.

The primary task is to involve people with disabilities in the world of physical education and sports, which, as world statistics confirm, are a necessary element of integration into public life. The person restores his physical functions to the level possible, but social connections can be restored in full. In addition, a disabled person can find activities within his strength, expand his social environment, set realistic goals in life, and cope with difficulties. APE is a full-fledged option for physical fitness rehabilitation.

At the moment, the state, which declares the choice of a socially oriented model of interaction with the population, the economy, within the framework of which the quality of life of a citizen will be maintained at an acceptable level, functions with the understanding that social security means are insufficient, with the desire to solve problems of protecting life and health, should intensify work with people with disabilities.

Indeed, in recent years the situation has begun to change. The state monitors the level of development and quality of medical services, however, certain difficulties are encountered with regard to the popularization of APE. Meanwhile, APE can return a person to society after injury, with various diseases. Personal self-actualization is one of the results of this type of physical education. Sport is the most universal tool that is actively used abroad and is spreading in the Russian Federation. A person with disabilities begins to live life as fully as possible, socializes, becomes a useful member of society, and his self-esteem changes. Self-esteem returns, and various plans are not only formed, but also brought to life.

By means of APE, a person with disabilities can be formed [3]: the awareness that one's own strengths may differ from the potential of healthy people, but self-improvement in the physical aspect can raise the limit. People with disabilities are trained to solve not only physical, but also psychological problems. They have developed a number of compensatory skills that allow them to successfully integrate into social life. They are able to withstand certain loads, cope with objective difficulties, strive to maintain a healthy lifestyle, bring benefits, grow in the personal aspect, be more efficient, active, including creatively.

To summarize, it should be noted the role of the state, which promotes APE and sports. There is certain federal and regional legislation, a number of state programs are being implemented, the corresponding infrastructure is being built, and projects are being financed. However, today there is a staff shortage, there is a problem of low motivation of people with disabilities, financing, and the pace of development of the relevant areas. That is, the quality of life of a disabled person needs to be improved using combined methods, means of physical education and social security.

Meanwhile, the successes of adaptive physical culture have only become more obvious in recent years. The Paralympic and Deaflympic Committee of the Russian Federation organizes the participation of athletes with disabilities in competitions at various levels. State statistics show that today already 30% of the country's regions are actively introducing APE into the life practice of people with disabilities [2]. Thus, the problem is solved, people with disabilities get the opportunity for socialization and development, and a way out of forced isolation.

The study is devoted to the achievements and prospects of AFC in the rehabilitation aspect. The article examines means and methods that are useful for people with disabilities seeking to restore health in every sense. Both the vitality and resilience of a person with a disability increases. Personal growth is observed, the physical, mental, and emotional state stabilizes, the desire to implement life plans, achieve results, and expand the social environment appears. A person becomes more independent and active, and can prove himself as a professional.

To summarize, it must be stated that physical activity and sports are part of modern life for people with disabilities. Despite all the problems and difficulties, the process continues, the prognosis is favorable. Russians are introduced to the adaptation system through physical activity, sports, and communication. Disabled people realize the opportunity to gain life experience, participate in individual and collective activities, and communicate of various kinds. Accordingly, APE has a huge and still insufficiently realized integration potential. Experts believe that the effectiveness of these methods in some cases exceeds that of medication. Undoubtedly, it is necessary to intensify work with people with disabilities in order to introduce them to physical education and sports. Such work is a means that can humanize and harmonize society so that attitudes towards people with disabilities change for the better, which will affect the health of society as a whole.

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民族民间文学艺术在跨文化智力形成中的作用
(以俄罗斯民间故事为例)

**THE ROLE OF NATIONAL FOLKLORE IN THE FORMATION OF
CROSS-CULTURAL INTELLIGENCE
(USING THE EXAMPLE OF RUSSIAN FOLK TALES)**

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抽象的。该研究考虑了利用俄罗斯民间传说(俄罗斯民间故事)的手段向外国学生教授俄语、扩大他们对俄罗斯文化的了解以及形成跨文化智能的可能性。

关键词: 俄语作为外语、跨文化智力、俄罗斯民间传说、民间故事、外国学生。

Abstract. *The study considers the possibilities of using the means of Russian folklore (Russian folk tales) to teach foreign students the Russian language, to expand their knowledge of Russian culture, and to form cross-cultural intelligence.*

Keywords: *Russian as a foreign language, cross-cultural intelligence, Russian folklore, folk tales, foreign students.*

Global changes in culture, politics, and economics today open up great opportunities for people, which manifest themselves in the ability to work, travel, study, etc. anywhere on the planet. There are more and more international companies, international projects, for the success of which, the ability to unite people of different nationalities in a team of like-minded people, the need to neutralize or eliminate interethnic conflicts is very important developed cross-cultural intelligence.

Thus, today the formation of cross-cultural intelligence (the ability of successful multicultural communication with representatives of another culture, ethnicity, etc.) and, as a result, the implementation of effective intercultural communication becomes a priority task of modern society, characterized by a multinational composition, diversity of languages and cultures, is of particular importance in the methodology of teaching Russian as a foreign language, especially in higher education. Along with professional interest in the language, students as a motivation for studying Russian language name the desire to get acquainted with the culture, history, everyday life, life of the country of the studied language.

Language cannot exist outside the culture of the nation speaking the language, because it is a manifestation of culture in all its aspects. Studying the culture of the country learners enrich and expand their linguistic horizons, get acquainted with world cultural values, acquire the opportunity to use in the future the positive experience of other cultures, to orient themselves in social attitudes, to take into account in practice the peculiarities of speech and non-speech behavior, formulas of politeness, etc.

At the same time, the language helps to see, understand and accept the surrounding world through the prism of national culture.

Foreign students are especially interested in works of folk art. It is not surprising, as they are original, reflect typical features of the national character of a Russian person, vividly reproduce folk wisdom, give an idea of the history, national customs and traditions of the Russian people, include the realities of Russian life. It is folklore that can become a guide on the difficult path of comprehending the peculiarities, rules and traditions of communication in Russia.

When foreign students come to Russia, they cannot pass by Russian folk art, especially Russian fairy tales, because they constantly encounter their characters (advertisements, names of cafes, restaurants, sculptural compositions in parks, etc.), hear in speech Russian folk art, especially Russian fairy tales.), they hear in the speech of Russian people stable expressions characteristic of Russian fairy tales (“for three faraway lands” “turn to the forest backwards, to me forwards”, etc.), formulas of comparison (“neither in a fairy tale to say, nor in a pen to describe”, non-equivalent vocabulary, well known to native speakers from early childhood (lapti, kum, teremok, bogatyr, etc.), appeals (batyushka, sis, etc.).

When foreigners get acquainted with Russian fairy tales, they get an idea not only about the life, traditions, customs, rituals of the Russian people, but also about the concepts important for understanding Russian culture: “patience”, “compassion”, “good”, “evil”, “feat”, “soul”, etc., which are found in these works of oral folk art.

Familiarization with Russian fairy tales is accompanied by the image of a typical Russian landscape (green groves, forests, oak trees, golden grassland), mention of national Russian dishes (kvass, porridge, kulichi, pancakes, shchi, soup, etc.), everyday objects (clay pots, tueski, wicker baskets, baby cradles, samovar and other kitchen utensils) [Matveenko, 2014; Evdokimova et al., 2020], naming rituals, holidays, religious objects, and other Russian realities (baptism, wedding, religious objects, funeral, barin, boyar, round dance, Shrovetide, wake, carols, etc.).

Reading Russian fairy tales, students become familiar not only with the features of speech etiquette, rules of social and cultural speech in human relations, but also with various linguocultural units and phrases that will describe the life,

customs, culture and traditions of the Russian people, as well as with those words that refer to the historical development of the Russian people. These are words that have no equivalents in other languages or designations of phenomena and objects that have analogs in comparable cultures, but differ in national principles of functioning, form, function of objects.

The semantics of linguocultural units is characterized by the reflection of national and cultural features of the Russian people related to customs and traditions, culture, national way of thinking, history, way of life, economic environment

At the same time, “a deep understanding of phonetic, grammatical and lexical features of the language being studied helps to better understand cultural features. These are two interrelated and interdependent processes that require careful study” [Yagubova A.S., Muriev M.V, URL]. The instructor helps students to understand the inconsistencies between the linguistic phenomena of the target language and the phenomena of their native language in the process of comprehending it.

When foreign students comprehend the peculiarities of the studied language, they better understand linguistic phenomena and facts, it not only enriches linguistic knowledge, but also expands the framework of the linguistic picture of the world, forms intercultural competence of students. It allows them to see the diversity of the multinational and multi-confessional world. When students study folk tales, they realize that different peoples look at the same phenomena in different ways, interpret and perceive them differently, but the tales of all peoples of the world, despite the differences, have much in common: they teach goodness, diligence, patience, the ability to appreciate the advice of elders.

All peoples' vision of the world and its perception cannot be the same. This dissimilarity determines the diversity and significance of ethnic cultures, which enriches the knowledge of each individual, makes the world around brighter, more interesting and understandable. Pupils should be familiarized with the culture of the country of the language they are studying, which implies not only literature and art, but also history, traditions, customs, lifestyle and models of behavior of the inhabitants of this country in various situations.

Thus, in the modern foreign-language educational process it is necessary to develop cross-cultural intelligence, allowing students to

- be open to the study of not only their own, but also foreign culture: social, psychological and other intercultural differences;
- adequately perceive foreign linguoculture, demonstrating a tolerant attitude to everything “new” and “foreign”;
- overcome cultural barriers for full-fledged intercultural communication with native speakers of the studied languages.

The study of folklore, in particular Russian folk tales, in this regard helps in solving several tasks: on the one hand, the student comprehends information about

the system of values existing in the minds of speakers of foreign linguoculture, enriches the vocabulary and learns the subtleties of grammar, which will later help him to choose the right speech tactics and avoid communicative failure in the conditions of intercultural communication.

Thus, in the modern situation it is necessary to search for new methodical approaches in the practice of developing the intellectual capabilities of foreign students, and the use of means of Russian folklore in the lessons of Russian as a foreign language allows to significantly increase the level of cross-cultural and general cultural intelligence of foreign students and facilitates the process of acculturation.

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前数字环境和数字环境与人类健康的干扰
**INTERFERENCE PRE-DIGITAL ENVIRONMENT AND DIGITAL
ENVIRONMENT AND HUMAN'S HEALTH**

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摘要.本研究描述了前数字环境和数字环境的特殊特征，它们彼此重叠，不仅是这些环境的总和，而且它们在不同点上相互加强，在其他点上相互削弱。前数字化和数字化媒体之间的相互影响体现在“干扰”这个词上。对数字和数字环境的干扰是在栖息地层面和人类生活的个人层面上考虑的。在个人层面上，沉浸在数字环境中对一个人的健康产生负面影响，但另一方面，它使他有机会成为维护和发展自身健康的主体。前数字环境和数字环境的干扰允许主体使用每个环境的资源能力来满足他们的需求。

关键词：前数字环境、数字环境、前数字环境和数字环境的干扰、人类健康。

Abstract. *This study describes special features of the pre-digital environment and digital environment, which overlap each other in such a way that there is not just a summation of these environments, but their mutual strengthening at different points and weakening at others. The influence of pre-digital and digital media on each other is reflected in the term “interference”. Interference to the digital and digital environment is considered at the level of the habitat and at the personal level of human life. On a personal level, immersion in the digital environment has a negative impact on a person’s health, on the other hand, it gives him the opportunity to become a subject in the preservation and development of his own health. Interference of the pre-digital and digital environments allows the subject to use the resource capabilities of each of the environments to meet their needs.*

Keywords: *pre-digital environment, digital environment, interference pre-digital environment and digital environment, human’s health.*

Modern people live in a world where digital technologies are widespread and integrated into different areas of life. All major human activities related to education, socialization and recreation are increasingly carried out through digital platforms, which are based on new ways of interaction (for example, integration into the social environment through social networks, recreation and learning through video or online games) . Over the past 20–25 years, we have truly witnessed a real scientific and technological revolution. Innovative digital technologies have been introduced into public life, medicine, and education. There are positive assessments of these innovations from both ordinary people and specialists. Social networks, online games, online learning, video calls, video conferences, digital services - all this is becoming commonplace in everyday life. People who lived in the real world are gradually moving to the digital world.

But whether people live in a digital or pre-digital world, traditional values will always be important. In particular, the problem of health will never lose its relevance, since human health is an important component of his prosperous life, which is significantly influenced by the living environment.

Traditionally, human habitat is the part of nature in which humans live. In the scientific literature, the following components of the habitat are distinguished: quasi-natural environment, residential environment, cultural environment, socio-economic environment. The fundamental difference between the habitat and the natural environment is that in the natural environment the biological law of the struggle for survival operates, while in the human environment social laws operate, and the environment itself is a product of the human spirit and mind. According to researchers, two levels of interconnection can be defined in the structure of the habitat: technological (between man and nature) and social (between people).[5]

Before the advent of digital technology, the human environment existed only in reality. This time can be designated as the period of the pre-digital environment. When to communicate with another person you had to meet him at home or in a cafe, and to gain knowledge you had to go to school or university. Digital technology has changed everything. There is now a digital environment where you can connect, learn, be entertained, and do it all from the comfort of your own couch. To connect to the digital environment, a person only needs a computer or smartphone.

The influence of the digital environment on people of generation Z (according to the generation theory of W. Strauss and N. Howe) is much stronger than on generations X and Y. They easily immerse themselves and accept the digital environment as a natural habitat. While representatives of generation Y more often perceive the digital environment only as a tool.

The influence of pre-digital and digital environments on each other is best reflected by the term “interference”. In physics, the interference process is consid-

ered in terms of the superposition of two waves on top of each other. When two waves superimpose on each other in a certain region of space, a new wave process is generated, because of which wave sections with double and zero amplitude appear.

This phenomenon among the humanities is most fully examined in linguistics, where speech interference is considered because of the negative influence of the characteristics of the native language and the characteristics of the language being studied on an individual's mastery of the language being studied. This is a simultaneous two-way process, expressed in phonetic-phonological, semantic, and other speech errors. [3]

In pedagogy, interference is understood as follows: if a student is presented with two blocks of information in a row and there is no pause between them (or it is too short), then both blocks of information will be forgotten by the student. In other words, the memory of one information deteriorates under the influence of another. [9]

Psychologists Panov V.I. and Patrakov E.V. consider the area of interference between pre-digital and digital environments as a new environment that has the characteristics of "parent" environments and its own unique properties. Researchers note that in the area of interference, the risks and resources of the subject change, since the interference environment absorbs less effective environments from the subject's point of view (for example, environments that do not satisfy the needs of the subject).[8]

It is obvious that the interference of pre-digital and digital environments has a significant impact on human health. G.L. Apanasenko identifies four fundamental processes that determine the health status of any human population: reproduction of health, formation of health, consumption, and recovery. Reproduction of health means the birth of healthy offspring and preservation of the gene pool. The process of health formation is regulated by several factors, the main of which are the individual's lifestyle and the state of the environment. In the process of consuming health, the conditions, nature, and organization of work (training) become of particular importance. Health restoration includes recreation (rest), treatment, medical and social rehabilitation.[2]

The interference process affects all four fundamental processes of health: reproduction, formation, consumption, and restoration. The modern generation finds it difficult to control the time spent in front of a smartphone or computer screen, which leads to negative consequences for their health. In the process of consuming health, a person is forced to spend a large amount of time at work or study on the global network or in front of a monitor screen. In the modern world, almost any type of work involves performing part of it on a computer. When we talk about the process of restoring health, we mean outdoor recreation, visiting cultural events,

and sanitary resort treatment. However, most young people relax by playing video games and communicating with friends on the global network. But these same people in a few years will be involved in the process of health reproduction and whether they will be able to maintain a healthy gene pool is a big question.

The influence of the digital environment on various components of health is studied by researchers in different aspects.

Prolonged video gaming may cause direct or indirect neurodevelopmental impairment.[10] Excessive Internet use leads to a decrease in a person's verbal intelligence, delaying the development of areas of the brain associated with language processing, attention, memory, and emotions. In addition to advergames encouraging unhealthy food consumption. [4]

Russian medical scientists studied the influence of the global network, mobile phones and digital gadgets on the health of students. They found that the active use of the digital environment by students led to a reduction in sleep duration and contributed to physical inactivity. Among the main complaints were asthenopia, headaches and carpal tunnel syndrome. [1]

But we are not just talking about the digital environment, but about the process of interference, therefore there are also positive phenomena. One of the positive aspects influencing the formation of health in the digital environment is mobile medical applications. Mobile health apps have several benefits: first, it improves people's access to health information; second, improving health monitoring; third, improving treatment compliance (reminders to take medications, to see a doctor, to sign up for procedures); fourth, improving communication between patients and healthcare professionals. [7]

So, the human environment includes everything that surrounds a person. This includes nature, buildings in the city, other people, cultural objects, etc. Before the advent of the digital environment, the real environment (pre-digital environment) was the human environment. Now, with the advent of the digital environment, the habitat is divided into two levels: the real level and the digital level. Thus, we are witnessing the emergence of a new environment at the intersection of pre-digital and digital environments.

The negative impact of the digital environment on human health has been revealed. The use of digital devices, uncontrolled in terms of time and content, negatively affects the development of the individual, her social, mental, and physical state. [6]

Interference is seen as the superposition of two processes on top of each other, where the result is a new process in which some elements will be strengthened, and some will be weakened. In this case, the result of the application can be unpredictable. Considering the process of interference of the pre-digital and digital environments with each other, we get a new environment, the so-called mixed

reality. The pre-digital and digital environments overlap each other in such a way that there is not just a summation of these environments, but their mutual strengthening at different points and weakening at others. Thus, the pre-digital and digital environments do not exist separately, they combine and influence a person. At some points the influence of one of the environments may increase, and at others it may become weaker.

We believe that the interference of the pre-digital and digital environments exists not only at the level of the environment, but also at the personal level. This is the process of adaptation by the subject of various environments to individual needs. Or in other words, the interference of the pre-digital and digital environments allows the subject to use the resource capabilities of each environment to meet their needs. We observe how interference allows a person to use digital technologies to maintain and develop individual health.

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考虑到新手运动员掌握主要竞技动作的遗传倾向,手机游戏对新手运动员速度力物种技术形成的影响

INFLUENCE OF MOBILE GAMES ON THE FORMATION OF THE TECHNIQUE OF SPEED-FORCE SPECIES IN NOVICE ATHLETES, TAKING INTO ACCOUNT THEIR GENETIC PREDISPOSITION TO MASTER THE MAIN COMPETITIVE MOVEMENTS

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注解。 分析户外运动对9~11岁田径运动员跑、跳、投运动动作技术的影响。确定了通过户外游戏掌握的执行运动动作的技术。 考虑具有不同基因型特征的初学者运动员掌握速度-力量类型运动技术的程度。

关键词: 田径运动, 田径运动的速度-力量类型, 运动训练的初始阶段, 户外运动, 运动技术, 基因型特征。

Annotation. *The article analyzes the influence of outdoor games on the technique of motor actions in running, jumping and throwing in track and field athletes aged 9-11 years. The technique of performing motor actions, mastered through the use of outdoor games, is determined. The degree to which beginner athletes with different genotypic characteristics master the technique of speed-strength types of athletics is considered.*

Keywords: *athletics, speed-strength types of athletics, initial stage of sports training, outdoor games, movement techniques, genotypic features.*

Introduction. Z.K. Kholodov notes that at the initial stage of sports training, young athletes begin to master the basics of technique in track and field events. At this stage, multifaceted physical development and preparedness of beginning track and field athletes occurs due to the use of outdoor games in the training process [3]. It is important to note that the use of outdoor games not only affects

the development of physical abilities, the ability to switch to different modes of muscle work and increase the emotional background of those involved, but also contributes to the formation of movement techniques.

According to O.D. Borisova, games occupy a significant place in the physical education of children, from preschool and inclusive to middle school age, due to their positive impact on the complex development and improvement of the technique of motor actions, they prevent the occurrence of monotony in the training session [2].

V.M. Zatsiorsky points out sensitive periods of development of speed-strength qualities, which occur between the ages of 9 and 18 years, with an increase in their development occurring at the age of 14-16 years [1]. Taking into account sensitive periods, it is necessary to actively include outdoor games in training sessions, in particular from 10-12 years of age, when students begin training activities more consciously. Taking into account the sensitive periods for the development of special physical abilities, as well as the stage of sports training, it is necessary to include games, and to teach the technique of motor actions through a simpler and at the same time interesting performance of the technique of motor actions, as close as possible to the technique of the type of athletics being studied.

I.I. Akhmetov and V.A. Rogozkin note that based on the association of gene polymorphisms with certain physical characteristics, the genotype under study can be attributed to genetic markers of predisposition to endurance or speed/strength, or mixed physical abilities, to achieve the highest results in a chosen sport activities [4].

The purpose of the study is to determine the result of the impact of outdoor games, containing in their plot the main elements of competitive movements, on the formation of technique in speed-strength types of athletics in beginning athletes with different genotypic characteristics.

At the first stage of the study, the scientific literature on the research topic was analyzed, based on the results of which the features of the use of outdoor games at the initial stage of sports training in athletics were determined. Taking into account the analysis, outdoor games were compiled that promote mastery of the technique of motor action in running, jumping and throwing and were introduced into the experimental part of the training process.

The study was conducted on the basis of the sports school of the Olympic reserve No. 2 of the Honored trainer of Russia Alexander Romanovich Elfimov in Rybinsk, Yaroslavl region and the sports school of the Olympic reserve No. 1 for athletics in the Nevsky district of St. Petersburg. The experiment involved 200 children involved in running, jumping and throwing groups, who, taking into account previously conducted studies on molecular genetic analysis, were divided into subgroups in each group. The first subgroup of each group includes children

with a predisposition to the development of special physical abilities associated with sports activities; the second subgroup includes children who do not have a clear predisposition to develop special physical abilities. There are 70 children in the running group (in the 1st and 2nd subgroups there are 35 people each); in the jumping group there are 80 people, in each subgroup there are 40 athletes; There are 50 people in the throwing group, 25 people in each subgroup. So, in the group of running species, children with a predominant genetic tendency to develop speed, strength and speed-strength abilities. In the jumping group, there is a predominant focus on developing speed and strength abilities. In the throwing group, children with predominant genotypes tend to develop strength, coordination abilities and endurance.

The structure of the developed training program consists of the following provisions. The main time of the lesson (80%) is aimed at developing the leading motor abilities characteristic of each group of athletics types studied in the study. The remaining time (20%) is allocated to the development of other physical abilities and technical training of young athletes. The training program is designed for 4 days a week for 1.5 hours. At the same time, taking into account the characteristics of children aged 9–11 years and the athletics program, it was proposed to increase the effectiveness of the impact and enhance motivation, adding another day for classes in a form that includes the use of special outdoor games. This approach is aimed at increasing interest in classes, should contribute to better formation of movement techniques and increase the level of development of the necessary physical abilities.

The effectiveness of the experimental technique is expressed in the original training program. Sports training for children are characterized by purposefulness and even distribution of training resources. Each training session is aimed at one of the groups of speed-strength types of athletics. Uniformity is expressed in the concentration of means and methods used in the training session. At the same time, a game day is allocated, which is aimed at developing the technique of motor actions by type (running, jumping and throwing) and at developing special physical abilities. The game day is held separately and additionally. Its goal is to create motivation for athletics, strengthen the emotional background and sports spirit. The game day allows children involved to develop an interest in certain speed-strength types of athletics. Thanks to this, there is a targeted testing of various areas of speed-strength types. This approach allows you to decide on the choice of further specialization and purposefully plan your focus on one of the types of athletics (running, jumping, throwing).

The peculiarity of the games lies in their focus. 3-5 games are played, each of which is aimed at developing special physical abilities and teaching the technique of motor actions in each group of athletics events. The basis for choosing a game

is the performance of one or a number of leading technical elements of speed-strength types of athletics. The choice of games is determined by age characteristics, level of development of physical abilities, and motivational component.

As an example of the main assets included in the experimental gaming complex, the following games can be cited:

1. Game “Day and Night”. Organization: In the middle of the court, a line is drawn on which the teams line up with their backs to each other. One team is called “day”, the other “night”. On both sides of the center line, at a distance of 20 meters, one line is marked from one another. Conduct: The coach, located on the side of the players, calls the teams several times in a row: “Day”, “night”, “day”, etc. The players stand still and listen carefully. After a short pause, the coach unexpectedly loudly names one of the teams. Its participants run according to the technique of motor action behind the finish line, and the players of the other team catch up with them. You can only catch up to the finish line and only one player. If a catching player catches up with a member of the opposing team and touches him with his hand, he brings his team 1 point, but if he violates the movement technique, he will receive a penalty point. The game is repeated several times. The team with the most points wins.
2. Game “Fishing Rod with Stepping Jumps”. Organization. All players are divided into groups of 6 people. The leader in each group twists the rope with a bag at the end so that the bag slides along the floor. Description of the game. Players stand at a distance of two steps along the circle along which the bag slides. When the bag is close, the player takes a step forward, with another step he pushes off the ground and jumps over the bag with a rope by stepping; then quickly retreats to its original place. The affected player becomes the leader. The rope is twisted until each player jumps 6-8 times. Those who have been drivers the least number of times win in groups. Rules: Each player must perform a jump; the new driver begins to twist the rope in a new direction.
3. Game “Throwing a ball into a hoop.” Organization. A hoop is suspended at a height of 2.5-3 meters above the floor. At a distance of 3-4 meters from him, a line is drawn from which the ball will be thrown. One team stands behind this line, and the second takes a place on the opposite side at a distance of 3-4 meters from the hoop. Rules of the game. Members of one team take turns throwing the ball so that it flies through the hoop, and members of the other team serve them the ball. After all players on one team have made one throw, the teams change places. Each hit in the hoop is worth 1 point. A team member who misses or touches the hoop receives 1 penalty point. And the team with the highest number of points wins.

All participants in the experiment studied according to the developed training program for 3 months and 12 game days were held. Before the introduction of the experimental gaming complex into the training process of the students, the level of mastery of movement techniques in running, jumping and throwing was determined. After conducting classes according to the developed program, a repeated recording of mastery of the technique of the studied athletics motor actions was carried out in order to control the technical readiness of the students and the level of development of physical abilities.

To determine the initial level of mastery of movement technique in each athletics event, testing was carried out, where the technique was assessed in points. Tests such as running 30 meters from a high start, standing long jump, high jump using the “stepping over” method, and throwing a small ball from a running start at a target were carried out. Gradation of points: 4 points – no errors were made in the technique of motor action; 3 points – 1 typical mistake was made; 2 points – the presence of 1-2 significant errors in the technique, 1 point – 1 serious error was identified; 0 points – motor action technique not performed. The results of the study of the technical readiness of the subjects, before and after the experiment, are presented in Table 1.

Table 1
Results of children’s technical preparedness before and after the experiment (n=200).

Tests, period experiment		Run		Jumping		Throwing	
		1 preparation M±m	2 sub-groups M±m	1 preparation M±m	2 preparations M±m	1 preparation M±m	2 preparations M±m
30m run, (points)	before	2.7±0.6	2.5±0.8	2.5±0.4	2.4±0.5	2.4±0.2	2.3±0.6
	after	3.1±0.5	3.2±0.8	2.9±0.4	2.8±0.5	2.7±0.5	2.8±0.4
	P	≤0.05	≤0.05	≤0.05	≤0.05	≥0.05	≤0.05
Long jump (points)	before	2.3±0.4	2.3±0.2	2.6±0.6	2.6±0.4	2.5±0.1	2.1±0.1
	after	3.0±0.8	2.7±0.5	3.2±0.6	3.1±1.2	2.6±0.2	2.5±0.7
	P	≤0.05	≤0.05	≤0.05	≥0.05	≤0.05	≥0.05
High jump (points)	before	2.6±0.4	2.6±0.5	2.5±0.5	2.5±0.5	2.8±0.1	2.7±0.2
	after	3.0±0.4	3.0±0.7	3.0±0.5	3.1±0.5	2.9±0.1	2.9±0.2
	P	≤0.05	≤0.05	≤0.05	≤0.05	≤0.05	≤0.05
Running throw of a small ball at a target (points)	before	2.3±0.1	2.3±0.1	2.6±0.5	2.2±0.5	3.0±0.8	3.1±0.3
	after	2.8±0.5	2.5±0.1	2.7±0.5	2.7±0.5	4.5±0.7	3.5±0.3
	P	≤0.05	≤0.05	≥0.05	≤0.05	≥0.05	≤0.05

From the data presented in the table, it follows that all participants in the experiment improved their technical readiness results.

Considering the results of assessing technique in the 30-meter run, it was revealed that the average values for all groups were at the same level before and after the experiment. But the children of the second subgroup in the running group significantly improved their results, and it is important to note that in this subgroup children do not have a pronounced predisposition to develop speed-strength abilities, but have a tendency to develop coordination abilities. Also, during gaming activities, there was a tendency towards improvement in the technical component for all types considered.

Based on the results of technical readiness in standing long jumps, it can be noted that initially the level of technical performance of a motor action was higher among children in the group of jumping events, and the worst technique was demonstrated by children of the second subgroup in the throwing group. At the end of the experiment, the results of all subjects significantly improved, with the exception of children in the first subgroup of the throwing group, where the results changed slightly. It is worth noting that in the first subgroup of the throwing group, children with a predominant tendency to demonstrate strength and coordination abilities are engaged.

The results of technical readiness in high jumps before the experiment did not differ significantly. After the experiment, the children in the running and jumping athletics groups significantly improved their movement technique.

In throwing a small ball from a running start at a target, there is a higher level of technical readiness in the throwing group. After the experiment, the experiment participants in this group confirmed their level of technical readiness. In addition, it can be noted that young athletes from the first subgroup of running events and the second subgroup of jumping also significantly improved their motor technique.

According to the results of the study, it was revealed that after the experiment, children in the first subgroups, who have a high predisposition to the manifestation and development of physical abilities, the results were significantly higher than those of the experiment participants in the second subgroups. It was determined that in children of the first subgroups, due to the use of outdoor games, mastering the technique of movements of athletics events using the experimental method with each lesson was faster. They showed themselves more actively, were motivated to achieve high results, and at the same time their level of development of special physical abilities increased. In children of the second subgroups, who do not have a pronounced tendency to develop special physical abilities associated with the requirements of the chosen sports activity, the results reflecting technical readiness improved more slowly. They needed more time to master the technique of the movements being mastered. However, they are also characterized by high interest and motivation to exercise, but they need more time to develop physical abilities.

The use of special outdoor games contributes to the complex physical development of the body, mastering the technique of motor actions through interesting and varied exercises, increases interest in classes and forms the best character traits and behavioral characteristics at the initial stage of sports training.

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在外语学习过程中培养学生的多元文化个性

DEVELOPING THE MULTICULTURAL PERSONALITY OF THE SCHOOL STUDENTS IN THE PROCESS OF FOREIGN LANGUAGE LEARNING

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注解。现代世界各国之间经济联系的快速发展创造了条件，使与不同文化代表建立互利对话的能力成为一项关键能力。培养一个成功参与跨文化交际的人——多元文化人格——成为教育理念的重要组成部分。

关键词：多元文化人格、多元文化主义、教育的语言和文化方面、语言文化、文化智力、外语、学校、交际能力、跨文化对话、跨文化、宽容。

Annotation. The rapid development of economic ties between countries in the modern world creates conditions in which the ability to build a mutually beneficial dialogue with representatives of different cultures becomes a key competency. Raising a person who successfully participates in intercultural communication-multicultural personality-becomes an important component of the educational concept.

Keywords: multicultural personality, multiculturalism, linguistic and cultural aspect of education, linguistic culture, cultural intelligence, foreign language, school, communicative competence, intercultural dialogue, interculture, tolerance.

The traditional educational paradigm does not keep up with the requirements of modern society for professional education. To educate a future competitive specialist, it is advisable to build an educational process already at school that is capable of developing flexible communication skills. A tolerant perception of the world belongs to the category of professional competencies that are relevant already at the initial stage of education: the development of cultural intelligence in schoolchildren has a beneficial effect on their adaptability to a new environment, and also stimulates intellectual activity, which in the future will help to find original solutions in non-standard situations.

In the modern world, communication is seen as an indispensable condition for human life and order in society [2, 5]. Raising a person who successfully partici-

pates in intercultural communication is becoming an important component of the new educational concept. The reorientation of pedagogical, methodological and linguistic sciences to the intercultural component makes it possible to create new formats of educational work that successfully develop professional competencies already in the early stages of education, and, more importantly, motivates students to actively participate in new educational projects.

Education, built on the principle of dialogism, finds support in the provisions of M.M. Bakhtin, who speaks of a person as “a unique world of culture, interacting with other personalities-cultures, creating themselves in the process of such interaction and influencing others.” It is obvious that healthy communication is possible only when the interlocutors accept and competently interpret the cultural values of the dialogue partner and at the same time realize their self-sufficiency and uniqueness. After all, it is through the dialogue of cultures that we understand self-worth: we have the opportunity to look at our heritage and discover unexpected aspects of our own traditions through the prism of another culture. Self-knowledge is impossible without comparing oneself to others; the only way to obtain information about oneself is through dialogue with others.

In this regard, it is urgent to develop an intercultural type of education, which will improve teaching and educational technologies and can be used as a tool for educating a multicultural personality.

The concept of intercultural dialogue in the context of pedagogical tasks is multidimensional: most authors present the term “intercultural” synonymous with the terms “multicultural” and “multicultural”. Within the framework of our study, there is no urgent need for detail and differentiation of these concepts.

Education and upbringing in a multicultural spirit has become the object of research by many scientists (V.S. Bibler, M.I. Bogomolova, L. Gurlitt, A. Ya. Danilyuk, A.N. Dzhurinsky, I.V. Kolokolova, V.A. Tishkov, F. Shanpelman and others). Due to the multi-level nature of the concept, the authors give it ambiguous definitions, but scientists are unanimous in their understanding of intercultural education as a set of knowledge and skills necessary for the development of tolerance, mutual understanding and the preservation of the cultural uniqueness of the peoples of the world.

The most important communication tool for representatives of various linguistic communities is language, and intercultural communication itself is the basis for learning a foreign language, offering an inexhaustible didactic resource. High potential for implementing the tasks of multicultural pedagogy lies in teaching a foreign language. The close connection between knowledge of a foreign language and the ability to understand and interpret new and unfamiliar facts of reality is obvious - language does not exist outside of culture, moreover, the manifestation of cultural aspects occurs only in the process of interaction and information ex-

change between people. Language is at the same time a means of communication, a tool for familiarization with the realities of other countries, as well as a way to gain knowledge and comprehend new cultural meanings. Thus, language and speech act as a means of familiarization with the foreign-language picture of the world [5, 15].

The linguistic and cultural approach involves students mastering the specifics of national traditions, way of life, value systems, aesthetic perception of the world, and non-verbal means of everyday communication of native speakers of the language being studied. G. Kostomarov and E. M. Vereshchagin, the founders of the research direction “Linguistic and Regional Studies,” considered it necessary to introduce into the process of teaching a foreign language linguistic and cultural educational materials that explain “the meaning of divergent (national) units for each pair of compared cultures, because two national cultures never coincide completely, each culture consists of national and international units” [3, 46]. Similar linguistic units are contained in authentic text materials, in national literature, and in folklore works. The pedagogical significance of authentic texts is undoubtedly great. This type of didactic material contains various models of speech habit. These can be types of politeness, and background, non-equivalent, connotative vocabulary, which allows expanding the linguistic and cultural knowledge of students. The introduction of regional studies material into the educational process is not only acceptable, but also recommended at any level of learning a foreign language, even at the initial stage. However, the selection of productive authentic texts and linguistic units is a rather complex process. Based on methodological experience, it is important to adhere to the principle of relevance, functional significance, frequency of use and compliance with age standards of modern speech behavior. But first of all, the selection of linguistic and cultural material is influenced by the leading component of the training system - its goal.

In many ways, the decisive role in the successful implementation of an intercultural approach is played by the personal factor: the manifestation of empathy, the willingness to accept otherness and the ability to reflect. A modern school has the task of educating a person capable of organically integrating not only into the national culture, but also the world, a person ready for self-realization and interested in effective intercultural communication at different levels of learning a foreign language: be it elementary, pre-threshold or threshold. Consequently, the content of training at the appropriate stages should be such material, without which communication with a native speaker of the target language is practically impossible.

Authentic can be literary and musical works, texts from everyday life (advertising signs, announcements, menus, receipts, tickets, theater programs), audiovisual materials, as well as texts of a “new nature” that create a feeling of immersion in the situations of everyday life in the country of the language being studied. and arouse keen interest among students.

Methods of presenting nationally marked vocabulary have their own specifics: the teacher needs to form ideas about new concepts using various means, since the proposed linguocultuems are not in the student's native language - these linguistic units have no analogues or equivalents, which means that interference is excluded. The linguistic and regional approach to teaching a foreign language creates conditions for the development of skills in a research approach to the social nature of language [6, 87], and, as a result, flexibility of thinking. These skills develop not only the student's linguistic sense, but also such components of communicative competence as empathy and tolerance, which dominate the assessment.

The development of cultural intelligence with the help of a foreign language enriches the personality and develops the individual characteristics of the student: broadens his horizons, enriches his knowledge base and develops an aesthetic perception of the world. A multicultural personality is being formed, capable of managing the processes of intercultural communication, creatively building inter-ethnic dialogue, creatively self-actualizing and perceives the diversity of national and world culture.

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外国学生适应俄罗斯大学学习：困难和障碍
**ADAPTATION OF FOREIGN STUDENTS TO STUDYING AT A
RUSSIAN UNIVERSITY: DIFFICULTIES AND BARRIERS**

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抽象的。 本文专门研究外国学生在俄罗斯大学学习过程的适应问题，随着俄罗斯高等教育的国际化和俄罗斯与中国之间人道主义合作的加强，这一问题变得越来越重要。 本文从包括教育学在内的各种科学的角度审视了“适应”概念的定义，确定了适应的主要问题，作者将其分为困难和障碍，并确定了一般最有效的方法 根据其发生机制来解决它们。

关键词：适应，留学生，适应困难，适应障碍。

Abstract. *The article is devoted to the issues of studying the adaptation of foreign students to the learning process at a Russian university, which are becoming more and more relevant in the light of the internationalization of Russian higher education and the strengthening of humanitarian cooperation between Russia and China. The article examines the definitions of the concept of “adaptation” from the point of view of various sciences, including pedagogy, identifies the main problems of adaptation, which are divided by the authors into difficulties and barriers, and determines the general most effective ways to solve them, depending on the mechanism of their occurrence.*

Keywords: *adaptation, foreign students, adaptation difficulties, adaptation barriers.*

Since 2012, after Russia and China signed the Memorandum on the implementation of the Action Plan for the development of Russian-Chinese interaction in the humanitarian sphere, educational cooperation between the two countries has reached a new level. The total number of students from both countries studying at universities in the partner country is growing year by year. According to the Rus-

sian Ministry of Education and Science, in 2022, 32.6 thousand foreign students from China studied at Russian universities. With the lifting of coronavirus restrictions, an increase in the number of people wishing to study in Russia is expected, therefore, the issue of effective adaptation is becoming one of the most important areas of work to popularize domestic education.

The processes of human adaptation to the surrounding natural and social world are under the close attention of many sciences. Thus, biology considers adaptation as the adjusting of an organism to stable and changing environmental conditions¹, and we are talking about the mechanism of evolution of a biological species in general and individuals in particular. In medicine, adaptation is considered to be the innate ability of an organism to adapt². Social sciences understand adaptation as the fitment of the organism or personality, and their systems to the nature of individual influences or to changed living conditions in general, or compensation for the shortcomings of established behavior in new conditions³. S.L. Rubinstein, in turn, believes that adaptation lies in the effective functioning of the protective mechanisms of the psyche, reducing emotional and psychological discomfort⁴. In pedagogical sciences, adaptation means fitment to the surrounding world and overcoming environmental limitations to implement a program of self-development and self-sufficiency, as well as understanding and accepting the values and norms of a new group, forming an attitude towards them and mastering a system of activities and interpersonal relationships.⁵

Thus, based on the analysis of various definitions of the concept of “adaptation”, it is clearly visible that any adaptation process is associated with overcoming any environmental restrictions that have a negative impact on the organization of high-quality life activities. Researchers of the processes of socialization and social adaptation of foreign students (Yu.E. Ignatova, L.T. Mazitova, E.B. Popkova, A.N. Sukhova, B.A. Fedev, etc.) indicate that students experience the following main problems: ignorance or insufficient level of knowledge of the language and culture of the country in which they arrive to study in the system of higher professional education; insufficient communicative readiness for the process of interac-

¹ Large Psychological Dictionary. – M.: Prime-EUROZNAK. Ed. B.G. Meshcheryakova, acad. V.P. Zinchenko, 2003.

² *Medical Explanatory Dictionary: about 8000 terms. -Ed. 5th, add. M.: Medpraktika-M, 2010. 267 p.*

³ Kuznetsov, P. S. Adaptation as a Function of Personality Development / P. S. Kuznetsov. – Saratov: Publishing house of Saratov State University, 2008. – 73 p.

⁴ Rubinstein, S. L. Fundamentals of General Psychology / S. L. Rubinstein. – St. Petersburg: Peter, 2000. – 712 p.

⁵ Dedkova N.S. Scientific Approaches of Domestic and Foreign Researchers to Determining the Essence of the Concept of “Adaptation” // Materials of the VIII International Student Scientific Conference “Student Scientific Forum” URL: <https://scienceforum.ru/2016/article/2016019426> (access date: 08.11.2023).

tion with people living in a given country; weak psychological readiness (cognitive, value-emotional, behavioral), etc.⁶

The purpose of our research is to identify the main reasons influencing the success of the process of adaptation of foreign students from China to the educational conditions of a Russian university. The study was conducted on the basis of Altai State University, where a fairly large number of foreign students from China study, both in the specialty of Russian as a foreign language, and in other specialties, so the issue of their effective adaptation to the educational environment is very acute. The study involved 22 1st-3rd year students studying Russian as a foreign language as a specialty. We conducted a survey in the form of an interview, which presented questions aimed at identifying problem areas in the adaptation of foreign students.

100% of respondents noted difficulties with the Russian language, and opinions differ regarding the content of the difficulties: the Russian language itself causes the most difficulties (grammar, vocabulary, differences between handwritten and printed letters, terms, etc.); 60% of students note a lack of basic knowledge about the Russian language and Russian culture, which, if they had had them at the time of their first arrival in Russia, could have helped students more effectively master more difficult academic structures; another 50% of respondents note language difficulties in the process of communication with representatives of the Russian-speaking people (speech is too fast, failure to distinguish case endings in speech, lack of knowledge of basic phrases for maintaining and starting a conversation). At the same time, 20% of students note a lack of desire to engage in communication in Russian caused by ignorance of basic rules and fear of being misunderstood, making a mistake. 40% of respondents express dissatisfaction with the conditions of study at the university: while 20% note the imperfection of the education system (too fast completion of the program, low level of individualization), and another 20% are dissatisfied with the lack of places in the dormitory, all that forces students to rent an apartment that leads to increased economic expenses, an increase in the amount of time spent on travel, and a lack of time for rest. 40% of respondents note physical discomfort: lack of proper sleep and rest, associated with an increased level of anxiety and a new level of responsibility, and digestive problems due to difficulties getting used to Russian cuisine. Another 10% of students demonstrate a lack of understanding of some everyday situations associated with a misunderstanding of Russian culture. Also, 10% of respondents note differences in the organization of everyday actions, for example, paying for purchases at the store checkout - due to the fact that the conditions in stores in Russia and China differ significantly, many find it difficult to navigate the correct procedure.

⁶ Sharonova E.G., Egorova L.D. Theoretical Foundations of Social Adaptation of Foreign Students in the System of Higher Professional Education // Fundamental Research. 2014. No. 8-5. pp. 1201-1205.

When analyzing the results obtained, we identified two types of problems underlying the adaptation processes of foreign students, which we designated as barriers and difficulties.

Barriers are objective external obstacles that make it difficult for foreign students to integrate into a foreign language environment. Barriers are problems common to all international students due to objective differences between their home society and the new society in which they are going to study. Such barriers include, for example, cultural misunderstanding, differences in the system of educational institutions, the general complexity of the Russian language, the peculiarities of the functioning of social facilities, for example, shops, visa services, police, etc. Since barriers are associated with system phenomena, they also need to be solved systematically. It can be assumed that the creation of a system of teacher-student supervision of foreign students can help overcome the barriers. Teachers are able to ensure that educational barriers are overcome, curators from Russian-speaking students can help effectively get acquainted with the cultural environment of the university and the city, and curators from among foreign students of the same country studying in senior courses can help first-year students solve a number of official issues that are faster and more effectively can be explained in the native language, for example, the procedure for undergoing a mandatory medical examination, solving problems with checking into a dormitory, etc.

Difficulties are subjective internal problems encountered by an individual student. For example, physical difficulties related to nutrition are noted by only some first-year students; moreover, these difficulties usually go away around the end of the first semester. Problems in everyday communication, for example, in a supermarket, are noted by only 10% of respondents, who, as a rule, do not have experience in using certain types of payment. Problems in communication may arise among students with a low level of self-esteem and/or an insufficient level of preliminary language training. Difficulties arise at the individual level and, accordingly, require an individual solution, taking into account the personality type of a particular student, the reasons for the difficulty, the level of complexity, etc. In different situations, individual work to improve the level of the Russian language, modeling as many everyday situations as possible in the classroom, working with a psychologist and many other measures can help.

Thus, it should be noted that successful adaptation of foreign students in the environment of a Russian university can only be ensured if the main problems that underlie it are correctly identified. Depending on whether a particular student is dealing with a difficulty or a barrier, different responses from the university will be required. That is why we see it advisable to further develop comprehensive measures of educational, namely cultural and educational adaptation of foreign students from China to the learning process at a Russian university, because it

is precisely complex ways of overcoming the main barriers and difficulties that can make the greatest contribution to the full integration of foreign citizens into Russian society, and therefore to the increase in the number of foreign students wishing to come to Russia to study at a university and to increasing the status of Russian education in the international arena.

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社会机构在SSE学生价值观和规范形成中的作用（基于ROS-2022研究）
**THE ROLE OF SOCIAL INSTITUTIONS IN THE FORMATION OF
VALUES AND NORMS OF SSE STUDENTS (BASED ON THE ROS-
2022 STUDY)**

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注解。 文章对中等职业教育学生的调查数据进行了分析。 这项调查是由俄罗斯社会学家协会于 2022 年发起，针对大学生和理工学院学生进行的，主题为“文化传统与代际联系” [1]。 通过对理工科学生的调查，我们可以追踪代际关系和社会制度对年轻人态度和价值观的影响程度。

关键词：小组、社会机构、学生、中等职业教育、价值观传播、家庭、大众传媒。

Annotation. *The article analyzes the data of the survey of students receiving secondary vocational education. The survey was conducted in 2022 on the initiative of the Russian Society of Sociologists among university students and SSE students on the topic “Cultural traditions and the connection of generations” [1]. The survey of SSE students allowed us to trace the degree of influence of intergenerational ties and social institutions on the attitudes and values of young people.*

Keywords: *small group, social institution, students, secondary vocational education, values transmission, family, mass media.*

Today, against the background of underestimation of secondary vocational education in recent decades, there is a shortage of specialists of this level in the country. This means that their value for society has increased. Responding to the demands of society, the number of those choosing this particular channel of continuing education is growing. Undoubtedly, society has to take into account the fact that young people, as a social group entering the public arena, bring their own interpretation of what is happening, form their own norms and values. Who are these young people, with what demands they will enter the labor market in a few years - some answers are offered in this article. In this text we look at the group of SSE students we interviewed and identify some of the channels through which their norms and values are formed.

Primary information was collected through an online questionnaire using a Google form. Processing of the data obtained in the course of the research was performed by D.V. Shkurin (developer of the Vortex software complex). The surveyed group (1773 SSE students) has the following socio-demographic characteristics: 58.3% of respondents are female, 41.7% are male, 95.2% of respondents are 16-20 years old. Of the respondents, 96.2% are in full-time education, 29.8% are studying on a fee-paying basis, and the rest are on a budgetary basis. At the time of the survey 51.3% are residents of medium and large cities. More than a half of respondents live with their parents, more than a third live in a dormitory or in a rented apartment, every 20th in his/her own apartment or a room with a roommate. Material wealth of students' families varies greatly: 3.8% of respondents' families have enough money only for foodstuffs. On the other hand, 9.1% answered that their families can afford expensive purchases: an apartment, a car, a dacha and others.

An important indicator of a young person's civic socialization is his/her attitude to the culture of his/her nation. The conducted research has shown that from generation to generation the awareness of the past of both their country and family decreases. Based on the analysis of teenagers' opinions about the knowledge of the history of the country and their family, the author comes to the conclusion about the insufficiency of emotional connection between generations, purely functional relation between its members. Continuing the theme, let us trace the reasons and frequency of SSE students' seeking advice from their relatives in different life situations.

Table 1
How often in different life situations do SSE students use advice, experience of relatives?

№	Sub-questions	never	rarely	often	Index
1	Organizing your life	17,3%	40,6%	42,1%	0,2482
2	Choosing a profession	17,4%	40,9%	41,6%	0,2420
3	Buying clothes, shoes	23,4%	42,5%	34,2%	0,1083
4	Choosing a part-time job	25,8%	38,6%	35,6%	0,0976
5	Planning income/expenses	26,3%	41,4%	32,3%	0,0592
6	When evaluating world events	27,7%	39,7%	32,6%	0,0485
7	Evaluating events in the country	28,0%	39,8%	32,1%	0,0412
8	Building relationships with people	29,8%	41,2%	29,0%	-0,0085
9	Choosing friends	37,8%	41,2%	21,0%	-0,1686
10	Choosing a life partner	40,5%	36,1%	23,4%	-0,1709
11	Choosing how to spend your free time	39,6%	42,0%	18,4%	-0,2121
12	Choosing books, music, movies, etc.	50,5%	32,5%	16,9%	-0,3362
13	Planning the number of children in your family	55,7%	27,9%	16,4%	-0,3931

The specifics of SSE as a stage of students' socialization and education have been discussed earlier [2]. It was found that students of this level are not quite independent in solving material problems, they have not formed their own experience of planning expenses, purchases, choosing a place of work, part-time work and profession. Based on the analysis, the author concludes that young people most often use the experience and advice of their relatives in organizing their everyday life and choosing a profession. This is also noted by the authors of other studies [3]. Young people least often use the advice and experience of relatives when spending their free time and building their own family life. However, the family as a psychological resource, where experience is shared and advice is received, remains a very important value of a young person. In a situation where the institution of the family is in crisis everywhere in the world and stereotypes of family relations and family structure are breaking down, only 40.5% of young people surveyed said that when choosing a life partner they never use the advice and experience of their relatives, and 55.7% never use the advice and experience of their relatives when planning the number of children in their own family.

The opinion of the reference group seems to be important for young people in all historical times. Which group besides family and close relatives is a reference group for SSE students in different life situations?

Table 2
Whose opinion in life situations is most authoritative for SSE students

№	Sub-questions	own opinion is more important	teachers	friends	bloggers	advertisers
1	Choice of profession	78,6%	7,5%	11,7%	1,1%	1,1%
2	Choice of friends	80,2%	5,9%	12,6%	0,6%	0,7%
3	Building relationships with people	78,5%	6,0%	13,5%	1,0%	0,9%
4	Organizing your life	78,5%	6,5%	12,0%	1,9%	1,2%
5	Buying clothes, shoes	71,4%	4,9%	19,5%	2,9%	1,4%
6	Spending free time	73,7%	4,6%	19,3%	1,2%	1,2%
7	Planning income/expenses	80,4%	5,5%	10,9%	1,9%	1,3%
8	Choosing a part-time job	73,4%	6,7%	15,6%	1,7%	2,5%
9	Choosing books, music, movies	71,3%	6,1%	17,9%	3,6%	1,0%
10	When evaluating events in the country	70,1%	10,5%	14,8%	3,3%	1,3%
11	When evaluating world events	70,1%	10,7%	14,4%	3,6%	1,3%
12	Choosing a life partner	81,2%	6,0%	11,2%	0,9%	0,7%
13	Planning the number of children in the family	82,8%	5,0%	10,6%	1,0%	0,7%

It is known that at the observed age, besides family, friends play a big role in a person's life. It is among friends that a young person can find support and self-expression. The research data confirm: it is friends who are significant groups in terms of spending free time, building relationships with people, choosing books and music, choosing a place of employment, evaluating events in the country and in the world.

The institution of education, as an institution of secondary socialization, plays a huge role in the lives of young people. One of the subjects of the educational process is a teacher, whose role and authority we learn about from SSE students' answers. The high authority of the teacher, as estimated by SSE students, is indicated in Table 2 in the following areas: choice of profession, assessment of events in the country, and assessment of events in the world. We would like to note in particular that despite the withdrawal of the educational component from Russian schools and the falling prestige of teacher's labor at the time of schooling of the respondents, the role of SSE teacher in the life of a young person and the authority of his/her opinion remain quite high.

One of the most important socializing institutions in the modern world is considered to be the institution of mass media. Do young people trust media assessments, how do they evaluate the role of the media in shaping moral values, in maintaining order in the country, and in supporting the activities of the social institution of the family? The answer to these questions is contained in Table 3, where students evaluate the activities and role of the media in the formation of people's culture, respect for the country and its past.

Table 3

There are different assessments of the role of mass media in shaping people's culture. Which opinions do you agree with and which do you disagree with?

№	Sub-questions	dis-agree	don't quite agree	agree	Index
1	Form a way of life	8,3%	43,2%	48,5%	0,4018
2	Form respect for modern Russia	9,4%	43,8%	46,8%	0,3749
3	Form respect for your country	8,9%	44,9%	46,2%	0,3732
4	Form respect for national culture	9,0%	45,1%	45,9%	0,3687
5	Form an understanding of the global world	10,8%	46,3%	42,9%	0,3201
6	Journalists show what they are well paid for	13,0%	45,3%	41,8%	0,2879
7	Form respect for the Russian Empire	13,8%	46,9%	39,2%	0,2541
8	Form a positive view of the CIS	11,5%	52,7%	35,8%	0,2422
9	Build respect for the Soviet Union	13,7%	49,1%	37,2%	0,2354
10	Media and bloggers have no position, they need «likes»	16,4%	47,7%	35,9%	0,1956

11	Provide objective information	16,4%	47,6%	36,0%	0,1954
12	Cultivate violence, crime	23,1%	48,3%	28,6%	0,0558
13	Destroy the family	33,0%	44,7%	22,3%	-0,1079

According to the respondents, the important role of mass media in the formation of respect for modern Russia, its historical past, and national culture is not fulfilled in due measure, or is at a rather low level. According to the respondents, the mass media also do not form an idea of the global world. As for the new direction of the information culture of young people - blogging, it, like the media, does not arouse much confidence. More than a third of respondents believe that the media and bloggers have no position, they need likes. The students have a similar opinion and close position regarding the objectivity of the media in presenting information.

The obtained data of the study show how social institution and small group broadcast values and social norms and anti-norms. When asked about the reasons why young people use foul language, 36.8% of respondents said that it is a norm in their student groups, 24.1% of SSE students think that it is fashionable, accepted in companies and funny, 18.4% agree that such behavior is promoted by mass media, 18% said that it is not condemned/it is accepted in my family (multiple choice of answers was allowed). As we can see, youth and student company is a very influential institution of socialization at this age - in the first place in the formation of SSE students' personal qualities. Besides, according to SSE students' estimations (18.4%) such behavior is promoted by mass media, 23.4% believe that such language is used by popular bloggers, and young people simply replicate it. Thus, we can observe a significant influence of some institutions of socialization on the formation of socially negative norms of speech and communication of SSE students: thus, according to 56.5% of SSE students, when using foul language it is possible to express their feelings more vividly, and 53.9% answered - "a person has the right to express his thoughts as he wants".

An important criterion for SSE graduates to decide on the place of further self-realization is the possibility of subsequent employment. The data in Table 4 show that 32.5% of respondents named the probability of getting a good job as the reason for making a decision: to stay in the country or to go abroad.

Table 4

After receiving your education, do you plan to live and work in the country of which you are a citizen, or will you try to go abroad?

№	Values	Frequency	% of respondents	% of those who responded
1	I will stay in my country	721	40,7	40,7

2	It depends on where I can get a good job.	576	32,5	32,5
3	I don't know yet.	335	18,9	18,9
4	Abroad	141	8,0	8,0
	Total respondents	1773	100,0	100,0

* Missing: 0 of 1773 (0,0%)

As the results of our survey show, SSE students often listen to the advice of their relatives when choosing educational and professional direction. The respondents listen to their parents' advice when choosing a spouse and planning the birth of children. Thus, intergenerational ties are not only maintained at the household level: the advice and experience of relatives are also used in various choices in personal life.

In order to better assess the closeness of intergenerational ties and the possible influence of relatives on the choice of a young person's future life path, on his/her self-realization plans in his/her country or abroad, we asked the question: "What do your parents, relatives advise you?".

Table 5
What do your parents (relatives) advise you to do?

Nº	Values	Frequency	% of respondents	% of those who responded
1	They want me to move to another country and will move to my place of permanent residence themselves	26	1,5	1,7
2	They want me to move permanently because they do not see any prospects in our country.	64	3,6	4,3
3	Support my desire to go to another country to earn money	93	5,2	6,2
4	They think that it should be my choice	727	41,0	48,5
5	They would prefer me to live and work in my native country.	589	33,2	39,3
	Total respondents	1499	84,5	100,0

* Missing: 274 of 1773 (15,5%)

The analysis of answers showed that 40.7% of students and 39.3% of parents support the young person's decision to stay in their country. Another 8% of SSE students plan to live abroad. As well as 10.5% of parents who want their children to go to another country for earning money and/or permanent residence because they do not see prospects in their home country.

Having compared the data of SSE students' answers to the questions about their plans after graduation and parents' and relatives' advice on this issue, we conclude that the positions of SSE students and their relatives are quite close, if not practically the same (as evidenced by the data in Table 4 and Table 5).

Socio-political reality and the activities of social institutions influence the position and further opportunities of a young person. Are young people satisfied with the time in which they live? Does it meet the social demand of students? To the question (one answer), in which historical time young people would prefer to live, we received interesting data. Basically, the aspirations of young people are in today and tomorrow. 25.2% of respondents would prefer to live now and only now, in 20-30 years, when the new generation grows up - this answer was chosen by 17.5%, less than 10% would prefer to live in the pre-revolutionary Russian Empire. Almost the same number of respondents chose the answer "During the World War II to defend the country like their ancestors", about every 20th respondent chose the answer "During the October Revolution of 1917, when a new country was being created". Let us note that for SSE students all the above choices turned out to be preferable to living during Brezhnev's and Gorbachev's times. The most unpopular choice turned out to be "During Yeltsin's time, when my country left the USSR and got an opportunity for sovereign development".

Summarizing the results, we note:

According to researchers, the institution of family in Russia is undergoing tremendous transformations. However, compared to the family in Western society, it still remains a rather traditional social institution. SSE students often listen to the advice of their relatives when choosing an educational and professional direction. The majority of respondents, according to the research [1], take care of their relatives, helping them in doing the necessary work, spending free time together, celebrating family and state holidays together, visiting them. In the formation of norms and values of SSE students, the institution of family still occupies high positions.

Another significant conclusion of the study is that the most important socializing institution represented by the media today fails to cope with the function of socialization of the young generation. The media's tasks to form respect for modern Russia, its historical past, and national culture are not being fulfilled to a proper extent. According to the respondents, the media do not form an objective view of the global world. The objectivity of the media in presenting information is also questioned.

The next conclusion refers to the educational role of educational institutions. The research has shown that despite the withdrawal of the educational component from secondary schools, the educational institution represented by SSE teachers continues to enjoy the trust of students. The opinion of teachers in assessing events

in the country and the world, as well as in choosing a profession, is quite authoritative for SSE students.

The survey data show that groups of friends are authoritative for teenagers in terms of spending free time, building interpersonal relations, choosing books and music, choosing a place of employment, assessing events in the country and the world.

Returning to the migration plans of SSE students, we would like to note that about one third of students plan to live and work after graduation where they can get a good job. Both in Russia and abroad. If citizens who have received a good, mostly free education, seek to implement their plans for labor and professional self-realization not in their own country but abroad, this may have serious negative consequences for the society, economy and politics of the country.

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童话疗法：欲望的实现与幸福之路（俄罗斯民间故事《愚人埃梅利亚》剖析体会）
**FAIRY TALE THERAPY: FULFILLMENT OF DESIRE AND THE
PATH TO HAPPINESS (EXPERIENCE OF ANALYZING THE
RUSSIAN FOLK TALE “EMELYA THE FOOL”)**

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抽象的。 本文不仅从民间传说的角度，而且通过童话疗法的投射方法论的棱镜来分析俄罗斯民间故事“愚人埃梅利亚”。 分析的结果是关于童话故事隐藏的信息的结论，关于它作为关于欲望的形成和发展的叙述的感知，这取决于社会的影响。

关键词：童话疗法、民间传说、俄罗斯民间故事、埃梅利亚、傻瓜的故事、愿望实现。

Abstract. *This article is devoted to the analysis of the Russian folk tale “Emelya the Fool” not only from the point of view of folklore, but also through the prism of the projective methodology of fairy tale therapy. The result of the analysis is the conclusion about the hidden message of the fairy tale, about its perception as a narrative about the formation and development of desire, which depends on the influence of society.*

Keywords: *fairy tale therapy, folklore, Russian folk tale, Emelya, tale of a fool, wish fulfillment.*

Every nation has a “golden fund” of folk tales. Researchers identify different groups of them based on their content and purpose: tales about animals, everyday tales, fairy tales. Usually, the study and analysis of fairy tales is the field of activity of philology, but recently psychologists are increasingly turning to them in the context of projective techniques, for example, fairy tale therapy in all its varieties. “From a psychoanalytic point of view, fairy tale therapy, acting on the unconscious level of the psyche, allows one to survive a problematic situation, promotes the development of self-awareness and personal growth”[1]. Thus, the Russian folk tale becomes a tool of the modern psychologist.

Clarissa Pinkola Estes’s book “Running with the Wolves” provides an interesting analysis of the Russian folk tale “Vasilisa the Wise”. The researcher discovers

new meanings, revealing the mythopoetic essence of artistic details, presenting the fairy tale as a manifestation of psychodrama, leading to transformation “this is a story about the initiation of a woman <...> about the realization that most things are not what they seem” [8 p. 68]. This article examines another Russian folk fairy tale, “Emelya the Fool” (based on this tale, a later literary version with a strong Christian edition appeared, called “At the Pike’s Command”). You can read the text in the collection “Russian Folk Tales” by A. N. Afanasyev [4], different versions, which are a retelling of the popular folk tale, are published under numbers 165-167.

From the point of view of folkloristics, the text of the fairy tale has been repeatedly analyzed by researchers Lyapunova I.P., Trubetskoy, E.N., Sinyavsky A., Tudorovskaya E., Azadovsky M.K., Neelov E.N. and others, but the psychological version of the interpretation of this work remained outside the scope of attention. What is this fairy tale about? What is her message? “The fairy tale is a lie, but there is a hint in it, a lesson for a good fellow” [6 p. 56]. How can you understand the “lesson” of the fairy tale about Emelya the Fool? Zinkevich-Evstigneeva T.D. writes about working with fairy tales: “Intimate, deep knowledge, not only about oneself, but also about the world around us, certainly heals. And precisely today, at the end of the millennium, people are intuitively drawn to it. They reread and interpret the Bible, look for hidden meaning in fairy tales, legends and myths, perhaps also in order to rediscover what has long been known in the depths of their souls? Fairytale therapy is treatment with fairy tales, <...> joint discovery with the client of the knowledge that lives in the soul and is currently psychotherapeutic” [2]. The fairy tale “Emelya the Fool” contains an important meaning that is relevant for our time.

First, you need to pay attention to the type of hero in fairy tales - a fool is not a name-calling, but a characteristic. This is a hero who a priori stands out from the rest of the characters. The classic beginning of the fairy tale, associated with the characteristics of the characters, can be seen in version 165: “In a certain village there lived a man, and he had three sons, two were smart, and the third was a fool, whose name was Emelyan” [4]. Older brothers are always smart, they are adapted to society, they know how to live correctly. Fool - no. “It is no coincidence that the fool is the third son in the family, since three is a sacred and sacred number, symbolizing the three sides of existence in the mythological worldview” [5]. Such a hero is closer to the magical world; a different meaning is available to him. “At the center of the folk tale about Emelya is one of the favorite images of Russian fairy-tale folklore - the image of a wise guy fool, which is closely related to the image of Ivanushka the Fool” [3]. Consequently, Emelya deserves close attention, his actions are not accidental and all the events that happen to him are endowed with a special meaning.

A fairy tale does not reflect, but transforms reality, so it is pointless to try to understand it literally. Emelya is a hero who has not lost his direct, childish view of the world, he is asked to bring water, chop wood, he answers honestly: "Lazy!", and only after promising that "if you don't go chop wood, then we will tell our husbands, so that they don't give you a red caftan, a red hat, or red boots" [4], he begins to do something. It is noteworthy that he does not fulfill his own desire, but follows the demands of those around him, that is, society. He does not have his own desires and aspirations; in this regard, he is passive, everything suits him, he lies on the stove until they begin to demand something from him.

And having received a magical gift from the pike - the ability to fulfill any desire after the words "at the pike's command, according to my desire," he wants very simple things: for the buckets to go home on their own, for the sleigh to ride without a horse, and for the ax to chop the wood itself." Even the motive of protection from attack (by a crowd in the city or an officer - depending on the version of the tale) is associated with a simple, primitive mechanism: the desire for a club to protect him. All magic is connected with momentary needs, although, it would seem, nothing prevents him from immediately wishing to become a smart and handsome king with his own palace. Why is that? What message does the fairy tale convey?

It can be assumed that the fairy tale is based on a story about desire, or more precisely about how basic needs are reborn into desires. First, under the influence of external circumstances, and then at the behest of the heart (the desire for the royal daughter to fall in love with him) and mind (to become smart and beautiful). The conversation between Emelya and Pike at the beginning of the tale is noteworthy. The hero asks: "What kind of happiness do you make?"; and receives the following answer: "But this is what happiness is: what you say, that's what will happen. Tell me: at the behest of the pike, at my will..." [4]. In other words, happiness is the fulfillment of desires, but not everyone's, but conscious ones that do not come from the outside? but from the person himself.

Emelya's first desire, as noted earlier, is to receive "a red caftan, a red hat and red boots" - this is promised to him for obedience. The mention of color is not accidental; in Russian folk tradition it marks something "beautiful, beautiful, excellent, best" [7], in other words, Emelya was promised good, beautiful clothes as a gift, i.e. external changes for the better if he fulfills what is asked. And for the childishly spontaneous Emelya, this is enough at the beginning of the fairy tale. But gradually everything begins to change.

The first independent request concerns the Tsar's daughter, "If at the behest of a pike, but at my request, such a beauty fell in love with me." Further, the hero, by inertia, continues to fulfill the desire of another, more precisely of the princess, who asks that they be freed from a barrel floating on the sea, and then, at her own

insistence, wants a palace to appear on the island. And only in this palace, “the fool, seeing that all people were like people, and he alone was bad and stupid, wanted to become better,” he himself wanted, for the first time in the entire fairy tale. And his wish came true. This is the most important climax of the entire fairy tale, its essence is the need for rebirth, awareness of one’s stupidity and inappropriateness. The hero was initiated and became worthy of the king’s daughter and equal to the king. This required the most important thing - understanding oneself and the desire for transformation.

In the context of fairy tale therapy, this is the most important aspect - a person’s awareness of his own desires, not imposed by society, coming from his true needs. In psychological practice, you can often meet a client who comes through with one request, but in the process of productive work, this request begins to change. It is not so easy to formulate the essence of a desire and understand its truth. In this case, a fairy tale helps to allegorically, metaphorically address the topic of desire, to follow in the footsteps of the hero on the path to understanding the nature of desire to find happiness, i.e. understanding oneself and striving for positive changes.

Thus, we can say that the fairy tale “Emelya the Fool” can be analyzed not only with the help of philological tools and is of interest to folklorists, but can also be successfully used as a psychoanalytic tool for fairy tale therapy. The fairy tale “Emelya the Fool” contains important meanings for understanding and represents a complex unity of simplicity and folk wisdom.

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在执行1982年粮食计划的框架内改进苏联农工联合体的管理系统: 项目和建议
**IMPROVEMENT OF THE MANAGEMENT SYSTEM OF
THE AGRO-INDUSTRIAL COMPLEX OF THE USSR IN THE
FRAMEWORK OF THE IMPLEMENTATION OF THE 1982 FOOD
PROGRAM: PROJECTS AND PROPOSALS**

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抽象的。 本文讨论了关于重组和改进苏联农工联合体和地区农工协会管理体系问题的项目和建议。 在这些项目中, 作者甚至在 1982 年粮食计划通过之前及其实实施期间就试图改变农工联合体的管理体系。 重组农工联合体管理系统的提案本质上是实用的, 可以成为粮食计划执行过程中所做出决定的替代方案。 重组农工联合体管理系统的项目和建议要么被认为为时过早, 要么被移交修订, 要么完全没有得到研究。

关键词: 农工联合体、苏联粮食计划、农业管理体系。

***Abstract.** The article discusses projects and proposals on the issues of reorganizing and improving the management system of the agro-industrial complex of the USSR and agro-industrial associations at the regional level. In these projects, the authors attempted to transform the management system of the agro-industrial complex even before the adoption of the 1982 Food Program, and during its implementation. Proposals for reorganizing the management system of the agro-industrial complex were practical in nature and could become an alternative to the decisions made as part of the implementation of the Food Program. Projects and proposals for reorganizing the management system of the agro-industrial complex were either considered premature, transferred for revision, or remained completely unstudied.*

***Keywords:** Agro-industrial complex, USSR Food Program, agricultural management system.*

The problem of reforming the management system of the country's agro-industrial complex has always received great attention, both from central and regional authorities, and from employees of various research institutions. By the beginning of the 1980s. in the agricultural sector of the economy there was no

mechanism for economic relations between numerous ministries and departments [3, pp. 199-200], which inevitably led to the search for new methods of effective management and management.

At different periods of the implementation of the 1982 Food Program, projects and proposals appeared on the issues of improving and reorganizing the management system of the agro-industrial complex.

In April 1979, the CPSU Central Committee received proposals for improving the management system of the agro-industrial complex "On improving the economic mechanism in the agro-industrial complex system", developed by the Department of Economics of the USSR Academy of Sciences [4, P. 303]. The main objective of these proposals was the gradual reform of the existing management system of the USSR agro-industrial complex. At the first stage, it was planned to create a Commission of the Presidium of the Council of Ministers of the USSR on the agrarian-industrial complex [1, pp. 281-282]. As part of the next stages, it was planned to create similar levels of management at the level of the union republics, ASSR, territories and regions. A distinctive feature of the new management system was to be a unified management structure that would coordinate the activities of all ministries and departments and disseminate the principles of operation of this system at the regional level.

After considering these proposals, the agricultural department of the CPSU Central Committee decided that their implementation was premature. At the same time, it is worth noting that soon, as part of the implementation of the 1982 Food Program, a similar model for managing the agro-industrial complex was developed.

The problem of low efficiency of agricultural production could be solved without the use of administrative methods, as the last president of VASKhNIL A.A. Nikonov believed. Thus, the process of improving organizational forms, in his opinion, should begin not from the top, but "based on the emerging situation on the ground as a result of specialization and concentration, inter-farm cooperation, find the most effective organizational forms of management of specialized and cooperative enterprises, and only then go to a higher level." level, meaning the republican and union level" [6, L. 60].

In the working notes of A.A. Nikonov, dated 1982, speaks of the absence of a unified management system of the agro-industrial complex at the district level, the replacement of economic management bodies by party bodies, which are not characterized by the performance of economic and administrative functions [7, L. 9-10].

The structure of organizing agricultural production management within a separate committee or body, including a system of interdepartmental and territorial management, was proposed in 1982 by specialists from the All-Union Scientific Research Institute of Agricultural Mechanization [5, L. 110].

With the help of a single management body, a systematic and clear distribution of complex work between ministries and departments was to be carried out [5, L. 111]. Within the framework of these proposals, collective and state farms of the region, industrial and processing enterprises, as well as other organizations of the agro-industrial complex were to be united into the territorial management system of the agro-industrial complex. However, for unknown reasons, these proposals were not considered in 1982.

Characterizing the existing system of management of the national economy of the region, the first secretary of the Moscow regional committee of the CPSU V. Mesyats points out obvious shortcomings in the system of its functioning: "... today local Councils do not have sufficiently strong economic and organizational levers in all areas of their activity to implement the functions assigned to them and the rights granted to them" [2, p. 42]. In continuation of his thought, the author gives an example of the simultaneous existence of several territorial plans in the region, approved by the Councils of Ministers of the USSR and the RSFSR, the Moscow Regional Executive Committee, and a plan formed by local authorities. The plans could differ significantly from each other, which clearly illustrates the lack of a well-functioning system of interaction between government bodies at different levels.

V. Mesyats in his article gives an answer to the question about the need for a unified territorial management body in relation to the management system of the agro-industrial complex of the Moscow region: "a single body would be excessively cumbersome, therefore in the region it would be more expedient to create new management units that would complement the created Mosoblagroprom" [2, P. 43]. The Moscow Regional Inter-Farm Production Association (MRIFPA) was to become such a governing body. Enterprises that were previously under dual subordination to the republican ministries and the Moscow Regional Executive Committee were to come under the full control of MOMPO. However, information about the creation of this association is not found in any of the sources.

In 1988, the Moscow Regional Committee of the CPSU received a Proposal from VNIETUSH (All-Union Scientific Research Institute of Economics, Labor and Agricultural Management) to organize the management of the agro-industrial complex of the Moscow Region. This was due to the fact that during the period under review, the Mosoblagroprom apparatus never got rid of its inherent shortcomings from the moment of its formation: the bulkiness and complexity of the structure remained (it included 126 divisions, with a total number of employees of more than 700 people); Departmental disunity in management was not overcome; the desire to raise the maximum number of functions to the regional level, including those that were to be performed and completed in enterprises and districts, remained [9, L. 16-17].

According to this proposal, it was not so much the improvement and clarification of the functions of the management apparatus that was required, but the creation of a new management body based on new principles and having different functions. It was planned that the management structure of the agro-industrial complex of the Moscow region would be built not on the basis of the territorial-sectoral principle, but on the functional-sectoral principle.

The main point of the proposed changes was that the functions of administrative and management departments should be transferred to self-supporting production systems.

The proposed option covered 8 sectoral formations of agro-industrial production. Each such formation should have included relevant specialized enterprises and organizations operating on the principles of self-financing or financed from the regional budget.

Four sectoral formations (crop production, livestock production, mechanization and electrification, personnel training) were to be part of the central apparatus of Mosoblagroprom. The four other industry formations (industrial processing of agricultural products, construction, logistics, scientific support) were supposed to build their activities on the principles of self-financing [9, L. 21-23].

Unfortunately, the case does not indicate the further fate of this proposal. But it is fair to note that these proposals were constructive in nature, and their implementation could have a positive impact on the further development of the agro-industrial complex of the Moscow region as a whole.

Projects and proposals to improve the management system were also developed in relation to a particular region. Thus, the explanatory Note to the management structure of the agro-industrial complex of the Moscow region [10, L. 29] provided for the preservation of the Moscow Regional Agro-Industrial Committee as a government body, but subject to a significant change in its functions and a reduction in the number of management staff.

At the same time, on a voluntary basis, it was planned to create an associative regional state-cooperative agro-industrial association (corporation) with elected governing bodies [10, L. 20].

All enterprises of the region's agro-industrial complex were to be united into the Union of State-Cooperative Agro-Industrial Formations (Mosoblagroprom-soyuz), with a rather complex and cumbersome management structure. However, in practice, the new management system was never implemented due to the ongoing changes in the political life of the country.

During the years of implementation of the 1982 Food Program, many proposals appeared to improve the management system of the agro-industrial complex. This trend is due to the fact that the authors of the projects tried to develop the most effective model for managing the country's agro-industrial complex both

at the all-Union level, at the level of the Union republics, as well as at the level of a separate region and district. One cannot but agree with N.A. Serogodsky's assessment. [8, pp. 66-67], who believes that during the years of perestroika, the reorganization of the management system acquired a permanent nature, and each subsequent one was carried out during the period when the previous one reached the stage of stabilization, connections acquired a stable character and the management apparatus finally began to work .

Many proposals were constructive in nature and could be used by the Soviet leadership as a general scheme for organizing a new management system for the agro-industrial complex. However, the considered projects were never implemented in practice or were completely left without due attention from the party leadership.

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海外华人在中国外交政策中的作用：美国的一个载体
**THE ROLE OF THE CHINESE DIASPORA IN CHINESE FOREIGN
POLICY: AN AMERICAN VECTOR**

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抽象的。 本文致力于以美国华人侨民为例来研究游说现象。 今天，美国政府的政策受到多种因素的影响，其中重要的是各种私人利益集团，即游说机构的活动的影 响。 文章介绍了美国亲华游说团体的主要活动。 中国的现代侨民政策显著增强了该国在国际舞台上的潜力。 通过海外侨民，中华人民共和国促进游说国家利益、传播文化价值观、经济发展以及在国外（包括在美利坚合众国）形成积极的外交政策形象。 该研究概述了中华人民共和国的任务，该国计划利用侨民政策作为影响力的决定性工具来实施这些任务。

关键词：游说、外交政策、侨民、侨民政策、海外华人、外交政策向量。

Abstract. *The article is devoted to the study of the phenomenon of lobbying using the example of the Chinese diaspora in the United States of America. Today, the policy of the US administration is influenced by a number of factors, among which significant is the influence of various private interest groups, namely the activities of lobbying structures. The article presents the main activities of pro-Chinese lobbies in the United States. China's modern diaspora policy has significantly strengthened the country's potential in the international arena. Through its foreign diaspora, the PRC promotes lobbying for the country's national interests, dissemination of cultural values, economic development and the formation of a positive foreign policy image abroad, including in the United States of America. The study outlines the tasks of the PRC, which the country plans to implement using diaspora policy as a determining instrument of influence.*

Keywords: *lobbying, foreign policy, diaspora, diaspora policy, overseas Chinese, foreign policy vector.*

In modern world politics, due to the spread of constitutionalism and democratization, there is a desire of citizens and public institutions to be involved in the political process. Consequently, lobbying is becoming one of the modern so-

cio-political institutions that tend to become widespread in various countries of the world.

The term “lobbying” was first used in the United States in the mid-twentieth century [1]. Lobbying is an institution of the political system, the basis of which is the promotion of the interests of individuals or corporate structures in government bodies, with the aim of influencing the internal life of the country and making political decisions beneficial to them.

Much attention to the ethnic lobby in the United States is due to the significant role of the United States in modern international relations and world politics in general. S. Huntington in his works noted the negative role of ethnic lobbies due to the fact that the “privatization” of American foreign policy is taking place, redirecting the country’s resources to serve the interests of private groups [6:294]. Z. Brzezinski also puts forward the thesis in his works that lobbying directly harms the national interests of the United States [3:67]. Their opponents believe that national interests, being protected by the country, are not subject to the influence of lobbying structures, therefore the lobby can act effectively only if its interests do not contradict the interests of the United States. Consequently, at the moment the question of the relationship between the national interests of states and lobbying remains controversial and open.

When considering the factor of the Chinese diaspora in the United States of America, it is important to note that today the Chinese diaspora in the United States is the largest in the world. According to the World Population Review, the Chinese population in the United States was 3.8 million in 2022, and it is growing four to five times faster than the population of the entire country [7].

Historically, the mass migration of Chinese to the United States took place in two stages: the first wave (1850–1880) and the second wave (late 1970s to the present). Initially, representatives of the Chinese diaspora were perceived in the United States as “capitalist traitors”. In turn, in China under Mao Zedong during the Cultural Revolution, overseas Chinese, especially those living in the United States, were treated as potential class enemies. The reforms of Deng Xiaoping were of great importance for the development of the diaspora policy of the PRC, during which the Chinese in America began to be seen as a source of capital and experts in the field of business and technology. Deng Xiaoping was confident that even those who chose not to return would prove useful to China in the long run. In fact, he began to use migration as an important tool of “soft power”.

The formation of the modern Chinese lobby dates back to the establishment (in 1979) and subsequent normalization of diplomatic relations between the United States and China. The Chinese lobby rapidly increased its influence, and by the end of the 1980s it openly admitted that it had “pro-Chinese” senators and members of the House of Representatives in the US Congress. The beginning of effective lobbying of the interests of the PRC in the United States dates back to

1989, since it was during this period, thanks to the efforts of lobbyists, that a serious anti-Chinese campaign was neutralized after the brutal suppression of student demonstrations in Tiananmen Square in Beijing [4].

The potential of the modern Chinese diaspora is actively used by the Chinese authorities not only to attract financial resources, but also to ensure a national presence in countries where diaspora communities live, as well as to promote the national interests of the PRC in countries where ethnic Chinese live. Representatives of the Chinese diaspora occupy some key positions in the US government, for example, Gary Locke. Locke is the first Chinese American governor, as well as the first Asian American governor in the continental United States. He was also the first Chinese American to serve as US Ambassador to China. [2]

It should also be noted that in the US Congress there is a separate bipartisan faction dedicated to China - the Congressional China Caucus, which since 2011 has launched its own website for members of Congress, experts on China and everyone who wants to enter into a dialogue and exchange information on economic, military and China's regional power [5].

Also, research institutes and foundations operating both in China and the United States, for example, the American-China Institute, the US China Policy Foundation, the Center for Strategic and International Studies, etc., can also be considered a manifestation of lobbying interests. Most of these organizations, in particular, financed congressmen's visits to China. All of them offer scholarships and other monetary awards that are aimed primarily at promoting U.S.-Chinese cultural, educational and scientific exchange.

Thus, today, China's diaspora policy has significantly increased the country's influence in the international arena. Through its foreign diaspora, the PRC promotes lobbying of its national interests, dissemination of cultural values, economic development, as well as the formation of its positive foreign policy image abroad, including in the United States of America.

Accordingly, the image of China in the United States is formed not without the participation of the Chinese diaspora. In the current realities, the economic aspect and cultural interaction have come to the fore in bilateral relations. In addition, despite the difficulties in trade relations between the two countries, Beijing seeks, using its diaspora, which successfully promotes the interests of the PRC in Washington, to undermine the status of Taiwan in the United States. Consequently, the Chinese vector of American foreign policy cannot be imagined without the influence of the foreign diaspora of the PRC on it, just as an analysis of modern Chinese policy is impossible without assessing the role of the Chinese diaspora within the United States of America.

Currently, Beijing is actively pursuing a policy towards overseas Chinese under the slogan "consolidate hearts, unite minds and develop opportunities for the revival of the great Chinese nation" [4]. Thus, China strives to actively promote patriotism and unity among overseas Chinese.

The above allows us to formulate the main tasks of the PRC, which the country plans to implement using diaspora policy as a determining instrument of influence. Firstly, the Chinese leadership, using its foreign diaspora, hopes to weaken political opponents and realize its strategic development goals, common to all Chinese. Secondly, China, through the use of diaspora policies, seeks to expand its influence, as well as its attractiveness and culture. Third, the PRC seeks to persuade overseas Chinese around the world to contribute directly to the country's development by providing resources, skills and knowledge.

It is also necessary to emphasize that, despite the fact that the Russian and Chinese diasporas in the United States have fairly identical potential, at least in terms of quantity, as well as in terms of education and qualifications (64% of the Russian-speaking population of the United States have bachelor's and master's degrees), Russian compatriots do not seek to represent the diaspora in government bodies and are distinguished by a fairly high level of apoliticality. At the same time, a significant part of the Russian population in foreign countries, due to the instilled Russophobia and the international situation in general, does not advertise their belonging to their ethnic group. Therefore, based on the above analysis of the role of the Chinese diaspora in the United States, it seems appropriate to conclude that the successful experience of the PRC in the field of diaspora politics could serve as a kind of example for the creation of an organized Russian diaspora on the basis of numerous disparate Russian communities.

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有效治疗晚发痤疮育龄女性细菌性阴道病的独家机会
**EXCLUSIVE OPPORTUNITIES FOR EFFECTIVE TREATMENT OF
BACTERIAL VAGINOSIS IN WOMEN OF REPRODUCTIVE AGE
WITH LATE ONSET OF ACNE**

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恢复。细菌性阴道病是泌尿生殖系统最常见的疾病之一，通常影响最活跃的育龄妇女。尤其重要的是，这种情况可能导致妊娠的病理过程、终止妊娠。此外，生殖系统的炎症会影响女性的荷尔蒙背景，导致雄激素过多症，随后可能出现雄激素依赖性皮肤病变，例如寻常痤疮。除此之外，细菌性阴道病的病原体对抗菌药物表现出很高的耐药率。这就是为什么探索治疗此类患者的新方法非常重要。

关键词：细菌性阴道病、阴道加德纳菌、乳酸杆菌、寻常痤疮。

Resume. *Bacterial vaginosis is one of the most common conditions of the genitourinary system, usually affecting women of the most active reproductive age. It is especially important that this condition can lead to a pathological course of pregnancy, termination of pregnancy. Moreover, inflammation of reproductive system affect the hormonal background of women, causing hyperandrogenism with the possible subsequent development of androgen-dependent skin pathology, for example, acne vulgaris. In addition to this fact, etiological agent of bacterial vaginosis shows high rate of resistance to antibacterial medications. That is why exploring new methods of management of this group of patients is very relevant.*

Keywords: *Bacterial vaginosis, Gardnerella vaginalis, Lactobacilli, Acne vulgaris.*

Bacterial vaginosis (BV) is one of the most common infectious pathologies of women of childbearing age. Bacterial vaginosis is a condition characterized by replacement of the normal microflora of the vagina, represented mainly by lactobacilli, by numerous anaerobic and other opportunistic flora. A connection has been established between dysbiosis and complications such as premature birth, infections of the chorion, amnion, amniotic fluid, and intrauterine fetal death. This suggests the need for screening for bacterial vaginosis and its treatment before pregnancy [1].

According to studies among various groups of women, bacterial vaginosis can occur from 15 to 80% of cases, and the frequency of detection of bacterial vaginosis among pregnant women can reach 40%. The research results showed that the clinical manifestation of bacterial vaginosis in women was characterized by profuse leucorrhoea (90%), the presence of an unpleasant odour (40%), dyspareunia (26.7%), itching (23.3%), dysuria disorders (13.3 %). However, in 3 (10%) women there was no clinical picture [2].

Increased interest in the problem of bacterial vaginosis is due to the presence of inflammatory processes in the reproductive system, which affect the hormonal levels of women, causing hyperandrogenism with the possible subsequent development of androgen-dependent skin pathology (acne, seborrhea, alopecia), as well as cervical neoplasia [3].

Gardnerella vaginalis is the most common etiological agent [4].

The absence of an animal model of *Gardnerella vaginalis* also makes its role in the development of bacterial vaginosis unclear. Today, most researchers agree that bacterial vaginosis is a polyetiological disease [5].

It is important to take into account that not only indigenous microflora, but almost all bacteria and single-celled fungi in the human body form communities protected from the environment by additional shells. In such communities, bacteria exhibit differentiation of features, as a result of which they are in different states. At the same time, a significant part of them has reduced metabolic activity. Many microcolonies are united using a special matrix into a common structure called a biofilm. Biofilms provide their bacteria with a significant increase in survival rate in the presence of antimicrobial medications, which determines resistance to conventional treatment methods [6].

Treatment of bacterial vaginosis is a serious medical problem. Bacterial vaginosis is a persistent syndrome characterized by vaginal discharge, unpleasant odour and discomfort. It is associated with the presence of a large diversity of anaerobic vaginal microbiota and a deficiency of lactobacilli.

Currently, systemic and/or local treatment with metronidazole or clindamycin is recommended for the treatment of bacterial vaginosis [7]. However, antibiotics have a negative effect on lactobacilli, which may cause relapse and the formation of various forms of dysbiosis of the vaginal microflora. A number of studies have noted the initial resistance of anaerobic bacteria associated with bacterial vaginosis to metronidazole (1%) and clindamycin (17%). Moreover, after a single course of therapy it increased up to 53%, which makes repeated courses of treatment ineffective [8].

Moreover, studies by foreign authors show that the basic resistance of anaerobic bacterial isolates reaches 20%, and after clindamycin therapy the resistance exceeded 50% [9].

Resistance of *G. vaginalis* to metronidazole during relapse was observed in almost 70% of strains [10].

Treatment with antibiotics reduces the absolute number of microbes associated with BV and temporarily improves symptoms. However, relapse of the disease reaches 30-60% a month after completion of therapy, what leads to the search for new effective treatment methods.

We analyzed data from the available world scientific literature on the problem of treating this disease. In particular, an article published in the medical scientific journal *Nature Medicine* in 2019 describes the case of the first clinical trials on transplantation of native vaginal microbiota [11]. Three healthy donors were selected and instructed to abstain from sexual contacts for a week before vaginal microbiota transplantation. Recipients - five patients with persistent chronic recurrent bacterial vaginosis without other concomitant diseases. On the seventh day of the menstrual cycle, vaginal fluid was collected from donors, diluted in a sterile saline solution and injected into the recipients' vaginas. Patients were examined daily for the first month, then once a month for the next three months after the manipulation.

Two patients showed improvement immediately after transplantation without recurrences of BV during 12 months of follow-up.

The third patient showed no improvement. She underwent another transplantation, after which she remained healthy for four months, and then relapsed again. After changing the donor and the third transplantation, no relapses were observed during the subsequent 12 months of examination.

The fourth patient needed three transplantations to achieve remission, but from the same donor.

The fifth patient, despite two transplantations, did not presented complete recovery.

The trial authors found no side effects from the treatment. But they note that the procedure may carry certain risks. First, it is necessary to examine the micro-

biota of donors for the absence of antibiotic-resistant strains. Secondly, it is important to ensure that there are no sperm in the vaginal discharge to avoid unexpected pregnancy. There may be other consequences that were not identified due to an insufficient number of patients.

Conclusion: Transplantation of native vaginal microbiota may be an effective solution for the treatment of persistent chronically relapsing BV. Nevertheless, follow-up clinical trials are needed to further explore this medical technology in the management of such forms of bacterial vaginosis.

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肾内白细胞介素6表达对2型糖尿病患者肾组织形态学变化的影响
**THE INFLUENCE OF INTRARENAL EXPRESSION
OF INTERLEUKIN-6 ON THE DEVELOPMENT OF
MORPHOLOGICAL CHANGES IN RENAL TISSUE IN PATIENTS
TYPE 2 DIABETES MELLITUS**

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抽象的。该工作致力于研究促炎细胞因子白细胞介素-6 (IL-6) 肾内表达在2型糖尿病肾病患者肾组织形态学变化发生和进展中的作用。检查对象为 49 名 2 型糖尿病患者 (平均年龄 66.58 ± 3.27 岁)。所有患者均对通过活体穿刺活检获得的肾组织活检进行光镜和免疫荧光显微镜检查。根据2010年制定的最新国际糖尿病肾病分类对组织形态学变化进行评估。根据光学显微镜, 12名患者被鉴定为IIa级 (轻度系膜扩张), 13名患者被鉴定为IIb级 (严重系膜扩张) 患者, 19 名患者为 III 级 (结节性 Kimmelstiel-Wilson 病变), 5 名患者为 IV 级 (晚期糖尿病肾小球硬化症)。使用标记为 Fitc 的单克隆抗体 (Dako, 德国) 通过免疫荧光测定肾小球和间质中 IL-6 的表达。

结果表明, 间质中IL-6的表达在间质性硬化的发生和进展中发挥作用($F=4.267$ $p=0.045$; $\beta=0.297$ $p=0.045$)。

关键词: 2 型糖尿病、糖尿病肾病、白细胞介素 6、肾组织活检、肾小管间质纤维化。

Abstract. *The work is devoted to studying the role of intrarenal expression of the proinflammatory cytokine interleukin-6 (IL-6) in the development and progression of morphological changes in renal tissue during diabetic nephropathy in patients with type 2 diabetes mellitus. The examination was carried out in 49 patients with type 2 diabetes (mean age 66.58 ± 3.27 years). All patients underwent light and*

immunofluorescence microscopy of kidney tissue biopsies obtained by intravital puncture biopsy. Morphological changes in tissue were assessed in accordance with the latest international classification of diabetic nephropathy, developed in 2010. According to light microscopy, class IIa (mild mesangial expansion) was identified in 12 patients, class IIb (severe mesangial expansion) was identified in 13 patients. , in 19 patients – class III (nodular Kimmelstiel-Wilson lesions) and in 5 patients – class IV (advanced diabetic glomerulosclerosis). The expression of IL-6 in the glomeruli and interstitium was determined by immunofluorescence using monoclonal antibodies labeled Fitc (Dako, Germany).

Shown, that IL-6 expression in the interstitium plays a role in the development and progression of interstitial sclerosis ($F=4.267$ $p=0.045$; $\beta=0.297$ $p=0.045$).

Keywords: *type 2 diabetes mellitus, diabetic nephropathy, interleukin-6, renal tissue biopsy, tubulointerstitial fibrosis.*

Introduction. Diabetic nephropathy (DN) is the main microvascular complication of diabetes mellitus (DM). 20–50% of patients with diabetes develop diabetic nephropathy, which is a major risk factor for end-stage kidney disease (ESKD) [1]. In 2019, 2.6 million new cases of DN were reported worldwide, and this incidence is predicted to increase in the future [2]. Recent data from the International Diabetes Federation (IDF) predict that by 2045, more than 10.5% of adults worldwide will have diabetes, resulting in kidney damage in 100–250 million people [3, 4]. Due to the rising incidence of diabetes mellitus, diabetic nephropathy is now the leading cause of end-stage renal disease (ESRD) worldwide.

Previously, there was a point of view that type 2 diabetes causes predominantly damage to the glomeruli, leading to the development of diabetic nephropathy (DN) [5]. It has been shown that tubulointerstitial lesions can develop independently of glomerular lesions [6, 7]. As the mechanism of DN pathogenesis has been studied, morphological changes in renal tissue in combination with clinical manifestations have prompted the American Diabetes Association (ADA) and NKF to reach a consensus to change the terminology from “diabetic nephropathy” to “diabetic kidney disease” in order to more accurately describe morphological changes in tissue and spectrum of renal dysfunction [8, 9].

Experimental and clinical research evidence has shown that immune renal inflammation plays a critical role in determining whether renal damage progresses in diabetes [10]. That is, it is assumed that innate activation of the immune system leads to chronic inflammation, which results in the development of DN due to increased production of proinflammatory cytokines involved in the development of renal tissue damage. Thus, inflammation is a key pathophysiological mechanism in the development of DN at an early stage [11]. The main cytokines involved in the pathogenesis of DN are interleukin-1 (IL-1), tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6) and interleukin-18 (IL-18) [12].

Purpose of this study is to study the role of expression of intrarenal production of proinflammatory cytokine IL-6 in patients with different morphological classes of DN and assessment of its effect on the development and progression of histological changes in renal tissue.

Patients and methods. Patients and research methods. The study was conducted on 49 patients suffering from type 2 diabetes mellitus (average age 66.58 ± 3.27 years), complicated by the development of DN. The patients' serum creatinine levels were no more than 0.13–0.14 mmol/L. The duration of DM was 17.70 ± 0.35 years, the duration of DN from the moment of detection of microalbuminuria to the morphological examination of renal tissue and diagnosis was 1.65 ± 0.34 years.

To confirm the morphological lesions of the renal tissue, all studied patients underwent light and immunofluorescence microscopy of kidney tissue biopsies obtained by intravital puncture biopsy. Morphological changes in tissue were assessed in accordance with the latest international classification of diabetic nephropathy developed by the Scientific Committee of the Pathology Society, USA [13]. Light microscopy of the biopsy was assessed according to the following indicators: the presence of global and segmental sclerosis of the glomeruli, cellularity of the glomerulus, the severity of expansion of the mesangial matrix (less than and more than 25%), thickening of the GBM, nodular Kimmelstiel-Wilson formations, the presence of hyaline caps, periglomerular sclerosis, sclerotic changes in the interstitium, the presence and severity of mononuclear inflammatory infiltrates in the interstitium, the presence of protein masses in the lumens of the tubules, atrophy and dystrophy of the epithelium of the urinary tubules (thickness of the apical edge and height of the epithelium of the tubules), hyalinosis of afferent and efferent arterioles. The severity of morphological changes was assessed using a semi-quantitative method in points (0–3). Global and segmental glomerular sclerosis was assessed as the percentage of globally and segmentally sclerotic glomeruli from the total number of glomeruli in the nephro biopsy section. Interstitial fibrosis and tubular atrophy (IFTA) was scored (0–3) as a percentage of the total interstitial and tubular area in the biopsy specimen. Mononuclear infiltration (IM), afferent and efferent hyalinosis (AH) were also scored (0–2 and 0–2, respectively) according to the criteria for the international classification of DN [13].

According to light microscopy, class IIa (mild mesangial expansion) was detected in 12 patients, class IIb (severe mesangial expansion) in 14 patients, class III (nodular Kimmelstiel-Wilson lesions) in 19 patients, and class IV in 5 patients (advanced diabetic glomerulosclerosis). In addition to light microscopy, expression was determined in all patients IL-6 in the glomerulus and interstitium using monoclonal antibodies labeled FITc (Dako Germany). An indirect method was used with mouse serum labeled FITc (Dako, Germany). The intensity of expres-

sion in points (0-3), the nature and location of IL-6 expression in the glomeruli (capillary loops, mesangial matrix, glomerular capsule) and in the interstitium (epithelium of the convoluted urinary tubules, basement membrane of the urinary tubules, interstitial cells) were assessed.

Statistical analysis. Statistical processing of the obtained data was carried out using the IBM SPSS Statistics software package, version 26 (Armonk, NY: IBM Corp.). Group results are presented as the arithmetic mean \pm standard error ($M \pm$ Standard Error). Statistical comparison of data between groups of patients was carried out using the nonparametric Mann–Whitney U test. Differences in continuous variables were assessed using the independent sample Student’s t test and were considered significant if $p \leq 0.05$. For statistical processing, parametric (Pearson’s method) and non-parametric (Spearman’s method, Kendall’s tau (τ) method) were used. To verify compliance with the condition of independence of observations, linear regression analysis was carried out (with the calculation of the coefficient of determination (R Square) and the Durban–Watson test) and analysis of variance (ANOVA Analysis of Variance) with the calculation of the Fisher test (F) to test the significance of the model. The standardized β coefficient with 95% confidence intervals was calculated. The critical level of significance for the difference in indicators was taken equal to 0.05.

Results.Initially, IL-6 expression was analyzed in the glomerular zone and interstitial space (Table 1).

Table 1
Intensity of IL-6 expression in glomeruli and interstitium in patients with type 2 diabetes with DN (n = 49)

Index	Localization in the glomerulus			Localization in the interstitium		
	Capillary loops glomerulus (1)	Mesangial matrix (2)	Glomerular capsule (3)	Epithelium of the urinary canal tsev (4)	Tubular basement membrane (5)	Interstitial cells (6)
IL-6	1.276 \pm 0.17	0.511 \pm 0.15 P1.2<0.001	0.143 \pm 0.01 P1.3<0.001	1.255 \pm 0.15	0.140 \pm 0.09 P4.5<0.001	0.149 \pm 0.08 P4.6<0.001

Maximum expression IL-6 was detected along capillary loops in the glomeruli and in the epithelium of the urinary tubules. Apparently, endothelial and epithelial cells of renal tissue have an increased ability to produce IL-6. However, the intensity of IL-6 expression depended on the morphological class of DN. An analysis of the frequency of IL-6 expression in kidney tissue depending on the morphological class of DN is presented in Table 2.

Table 2.

Frequency of detection (percentage, %) of IL-6 expression in different zones of the glomerulus and interstitium in patients with type 2 diabetes with DN (n = 49)

Localization IL-6 expression	IIa class n = 12	IIb class n = 13	III class n= 19	IV class n= 5
Capillary loops of the glomerulus	58.3	61.5	57.9	60.0
Mesangial matrix	50.0	23.0	31.6	0.0
Glomerular capsule	41.7	61.5	42.1	60.0
Epithelium of urinary tubules	83.3	76.9	75.0	80.0
Basement membrane of urinary tubules	25.0	30.8	30.8	20.0
Interstitial cells	25.0	46.2	38.5	0.0

The frequency of IL-6 expression along the capillary loops and in the epithelium of the glomerular capsule is detected at a constant level regardless of the class of DN, and in the area of the mesangial matrix decreases with the development of nodular Kimmelstiel-Wilson lesions. In the group of diabetic glomerulosclerosis, which corresponds to class IV DN, glomerular expression of IL-6 was not determined. In the area of the epithelium of the urinary tubules and the basement membrane of the tubules, IL-6 expression was detected with the same frequency, regardless of the class of DN. With the development of severe interstitial fibrosis, that is, in the group of class IV patients, IL-6 expression was absent.

Next, a correlation analysis was carried out of the influence of IL-6 expression (both in the glomerular zone and in the interstitium) in patients with DN on the development of morphological changes in renal tissue, which included: the percentage of globally and segmentally sclerotic glomeruli; severity of expansion of the mesangial matrix, thickening of the glomerular basement membrane; the presence of intercapillary adhesions and nodular formations of Kimmelstiel-Wilson, hyaline caps; periglomerular sclerosis and sclerotic changes in the interstitium; the presence of mononuclear inflammatory infiltrates in the interstitium and protein masses in the lumens of the tubules; atrophy and dystrophy of the tubular epithelium; hyalinosis of afferent and efferent arterioles. The first stage of the work was an analysis in each individual morphological group of patients (IIa, IIb, III class); in the IV class group, a correlation analysis was not carried out due to the small number of patients (5 people). The results obtained were quite unexpected. Table 3 shows only reliably significant correlations identified in these groups.

Table 3.

The influence of IL-6 expression in the glomerular zone and interstitial space on morphological changes in patients Type 2 diabetes in groups IIa and IIb

Morphological changes in DN	Expression of IL-6 in the glomerular zone		Expression of IL-6 in the interstitium
	Segmental sclerosis	Glomerular basement membrane thickness	Atrophy of the tubular epithelium
Class IIa (mild mesangial expansion) (n=12)	r=0.912 p=0.0001; R=0.812 p=0.004; τ =0.765 p=0.01	-	r=0.690 p=0.027; R=0.697 p=0.025; τ =0.674 p=0.034
Class IIb (severe mesangial expansion) (n=13)	-	-	r=-0.553 p=0.040; R=-0.548 p=0.042; τ =-0.514 p=0.048

As can be seen from the table data, the results obtained turned out to be multidirectional and not very informative in each group. Therefore, the groups were subsequently combined into a general group of patients with type 2 diabetes with DN in which a correlation analysis was carried out. The results are presented in Table 4.

Table 4.

The influence of IL-6 expression in the glomerular zone and interstitial space on morphological changes in the general group of patients with type 2 diabetes with DN (n = 49)

Morphological changes in tissue	Localization of IL-6 deposits	
	Glomerulus	Interstitial
Proliferation of glomerular mesangial cells	r=0.495 p=0.0001 τ =0.506 p=0.0001 R=0.514 p=0.0001	-
Expansion of the mesangial matrix	r=-0.311 p=0.033 τ =-0.304 p=0.033 R=-0.314 p=0.032	-
Interstitial sclerosis	-	r=0.297 p=0.045 τ =0.211 p=0.047 R=0.238 p=0.012

Next, an analysis of variance (ANOVA “Analysis of Variance”) was carried out using the F test and calculating the standardized beta coefficient (β) with 95%

confidence interval. Expression of IL-6 deposits has been shown to play a role in the development and progression of interstitial sclerosis ($F=4.267$ $p=0.045$; $\beta=0.297$ CI: 0.005; 0.374; $p=0.045$).

Thus, the results of the linear regression showed that with a pronounced immunoinflammatory reaction in the kidney tissue, IL-6 plays a role in the formation and further progression of interstitial sclerosis.

Discussion. The most characteristic histological changes in DN are expansion of the mesangial matrix, and accumulation of extracellular matrix (ECM) components, increase in deposits of types IV and VI collagen, laminin, fibronectin, thickening of the basement membrane, loss of podocytes, nodular glomerulosclerosis, destruction of endothelial cells [14]. Early tubular hypertrophy progresses into interstitial fibrosis with tubular atrophy. Subsequently, the renal tissue is infiltrated by immune cells [15].

The role of IL-6 in the development of DN was first demonstrated experimentally in 1994 [16]. Later there was published work [17], where the authors showed that mesangial, epithelial glomerular cells, podocytes and Bowman's capsule epithelium express mRNA IL-6. That is, IL-6 expression promotes the expansion of the mesangial matrix and thickening of the glomerular basement membrane by affecting the dynamics of the ECM level in mesangial cells and podocytes [18]. In 1992, a group of authors showed the induction of IL-6 on changes in glomerular endothelial permeability, proliferation of mesangial cells and increased expression of fibronectin [19]. Our results fully confirm these data, demonstrating that glomerular expression of IL-6 is important in the development of expansion of the mesangial matrix and increase in the thickness of the glomerular basement membrane in the general group of patients. In a correlation analysis separately in each group, a significant relationship between the expression of IL-6 and the thickness of the basement membrane was obtained only in the group of patients with severe mesangial expansion (class IIb). This may be due to the fact that we classified patients into DN classes according to the latest morphological classification of DN [13], which developed more stringent criteria for assessing histological changes in renal tissue.

When conducting regression analysis, we did not obtain data confirming the prognostic role of IL-6 in the rate of progression of mesangial expansion ($R^2=0.001$; $F=0.023$ $p=0.881$), the formation of nodular Kimmelstiel-Wilson lesions in the glomerulus ($R^2=0.001$; $F=0.033$ $p=0.856$), as well as in the thickening of the basement membrane ($R^2=0.038$; $F=1.775$ $p=0.189$). However, it can be assumed that the maximum production of IL-6 in the renal tissue triggers the mechanism of development of mesangium expansion, the formation of nodular lesions and an increase in the thickness of the basement membrane. In the future, with the extinction of intensive IL-6 production in the glomerulus, in particular in the area of the mesangial matrix, the process becomes irreversible..

The fibrogenic pathway of development of tubulointerstitial sclerosis is determined by the interaction between tubular and epithelial cells, fibroblasts and infiltrating mononuclear cells [20]. It has been hypothesized that the pathological reactions leading to the development of DN may first develop in the peritubular microcirculation, where they induce oxidative damage with the subsequent development of tubulointerstitial damage [21]. According to this hypothesis, one of the mechanisms of tubulointerstitium damage with the development of tissue fibrosis in DN is the independent production of profibrogenic cytokines in the glomerulus and interstitium. Our work shows that the production of IL-6 in the interstitium plays the role of a predictor of the progression of tubulointerstitial sclerosis. This is confirmed by the obtained statistically significant regression model for IL-6: $F=4.267$ $p=0.045$; $\beta=0.297$ CI: 0.005; 0.374; $p=0.045$;

Conclusion. Our results showed the role of IL-6 expression in the development of proliferation of mesangial cells and expansion of the mesangial matrix. Interstitial expression of IL-6 plays a significant role in the development and progression of interstitial sclerosis. Thus, the data obtained once again confirm the hypothesis about the main role of inflammation and proinflammatory cytokines on the development of glomerular, tubulointerstitial changes in patients with type 2 diabetes complicated by the development of DN.

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结合被动吸烟和主动吸烟的育龄妇女形成慢性阻塞性肺病的可能性，取决于吸烟者的服务年限

THE PROBABILITY OF COPD FORMATION IN WOMEN OF FERTILE AGE WHO COMBINE PASSIVE AND ACTIVE SMOKING, DEPENDING ON THE LENGTH OF SERVICE OF THE SMOKER

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注解。 为了找出育龄妇女尼古丁成瘾形成和发展为慢性阻塞性肺病的可能性，结合被动吸烟和主动吸烟，根据吸烟经历，在萨马拉市第八临床医院的基础上，我们进行了研究 53名吸烟且有被动吸烟的孕妇和54名吸烟但未被动吸烟的孕妇以及42名不吸烟、未怀孕的育龄妇女（对照组）的吸烟状况和外呼吸功能指标的结果，在诊所产前门诊观察。所有患者均按照 2011 年 GOLD（2020 年修订版）推荐的方案以及 2018 年俄罗斯呼吸学会的临床建议接受临床、实验室和功能检查。研究患者的选择是通过随机抽样进行的 满足所研究人群的代表性要求的方法。使用 Fagerström 测试确定尼古丁依赖程度，通过 Prohaska 问卷确定戒烟动机程度。所有吸烟患者都完成了“戒烟学校”。呼吸系统功能状态的评估是通过呼吸速度描记法（PTG）进行的，使用带有可更换高精度呼吸速度描记器（德国）的 FlowScreen 呼吸描记器。使用各种参数和非参数统计方法对研究结果进行了分析。为此，使用了 StatSoft（美国）的许可统计程序“Statistica”包。研究发现，慢性阻塞性肺病在第一组吸烟经历不同的人群中发生，从没有吸烟经历的患者中的4%增加到有10年吸烟经历的患者中的48%，以及超过20年吸烟经历的患者中的98% 的吸烟经历。在第二组中，COPD随着吸烟经历的不同而发生，从没有吸烟经历的患者中的0%增加到有10年吸烟经历的患者中的40%，以及有超过20年吸烟经历的患者中的100%。研究还发现，尼古丁依赖与吸烟经历（ $p = 0.000$ ）以及吸烟本身和被动吸烟的结合密切相关。与单独主动吸烟相比，主动吸烟与被动吸烟的结合会促进尼古丁成瘾更快发生。

关键词：育龄妇女、吸烟、尼古丁成瘾程度、吸烟经历、慢性阻塞性肺病。

Annotation. In order to find the likelihood of the formation of nicotine addiction and the development of COPD in women of fertile age, combining passive and active smoking, depending on the smoking experience, on the basis of the Samara City Clinical Hospital No. 8, we studied the results of the smoker status and

indicators of external respiratory function in 53 smoking pregnant women, with passive smoking and 54 smoking pregnant women without passive smoking, as well as 42 non-smoking, non-pregnant women of fertile age (comparison group), observed in the antenatal clinic of the clinic. All patients underwent clinical, laboratory and functional examinations in accordance with the protocols recommended by GOLD 2011. (revision 2020), as well as clinical recommendations of the Russian Respiratory Society 2018. The selection of patients for the study was carried out using a random sampling method that met the requirements of representativeness in relation to the population being studied. The degree of nicotine dependence was determined using the Fagerström test, the degree of motivation to quit smoking was determined by the Prohaska questionnaire. All smoking patients completed "smoking cessation school." The assessment of the functional state of the respiratory system was carried out by pneumotachography (PTG) using a FlowScreen spirometer with a replaceable high-precision pneumotachograph (Germany). The results of the study were analyzed using various methods of parametric and nonparametric statistics. For these purposes, the package of licensed statistical programs "Statistica" from StatSoft (USA) was used. As a result of the study, it was found that COPD develops in the first group with varying smoking experience, increasing from 4% in patients with no smoking experience to 48% in patients with 10 years of smoking experience and 98% with over 20 years of smoking experience. In the second group, COPD develops with varying smoking experience, increasing from 0% in patients with no smoking experience to 40% in patients with 10 years of smoking experience and 100% with over 20 years of smoking experience. It was also found that nicotine dependence is closely related to smoking experience ($p = 0.000$) and the combination of smoking itself and passive smoking. The combination of active smoking with passive smoking promotes a faster onset of nicotine addiction compared to active smoking alone.

Keywords: *women of fertile age, smoking, degree of nicotine addiction, smoking experience, COPD.*

Relevance of the problem

Chronic obstructive pulmonary disease is a serious problem of our time due to its widespread prevalence, progressive course, and reduced life expectancy. Today, not only the medical but also the social significance of COPD is enormous and undeniable, making up a significant share in the structure of overall morbidity, disability and mortality of the population around the world [1, 2].

COPD is currently the fourth leading cause of death in the world and, according to experts, may become the third cause of death [3]. Studies have shown that even among smokers who consider themselves healthy, with a smoking duration of 10 years and smoking 20 or more cigarettes per day, severe impairment of external respiratory function is detected in 24% of cases [4, 5]. For a long time,

the prevalence of COPD was significantly higher among men, but in recent years the prevalence of COPD has increased among women, especially young women, and even the presence of the disease is not a predictor of smoking cessation [7–9]. Passive smoking also plays a significant role in the development of the disease among women and men [10, 11]. Currently, more than a third of women aged 15 years and older are regularly exposed to second-hand smoke [15]. The prevalence of passive smoking during pregnancy is quite high today.

Purpose of the study: to establish the likelihood of developing COPD in women of fertile age who combine passive and active smoking, depending on the smoking experience.

Material and methods

At the screening stage, 107 women were examined, and smokers were divided into two groups: 53 patients were active smokers exposed to sidestream smoke (passive smoking) at home, 54 patients were active smokers without passive smoking. Inclusion criteria: 1) women of fertile age from 18 to 49 years, 2) women observed in antenatal clinics for pregnancy. Patients were included in the study subject to their written consent for inclusion in the study, use and processing of data. Non-inclusion criteria: presence of a chronic non-infectious disease requiring dispensary registration.

Patients were randomized into 3 groups using the envelope method: group 1 (n=53) included pregnant women with COPD with an average smoking history of 8.37 years, a smoker index of 6.49 pack/years, with a COPD severity of mild to moderate, BMI ranged from 19 to 25, and had secondhand smoke (exposure to sidestream smoke). Group 2 (n=54) included pregnant women with COPD who had a smoking history of 8.31 years, a smoker's index of 6.39 pack/years, with COPD severity ranging from mild to moderate, with a BMI ranging from 19 to 25 and had no exposure to passive smoking. Patients underwent interviews, questionnaires, laboratory and functional examinations, starting from the first trimester, when registering for pregnancy. The comparison group (n=42) included non-pregnant patients aged 18 to 49 years, non-smokers, with a BMI in the range from 19 to 25, not previously registered with chronic nonspecific diseases.

The diagnosis was established based on the protocols recommended by GOLD 2011. (revision 2020), currently corresponding to the international recommendations of the GOLD 2020 revision, as well as the clinical recommendations of the Russian Respiratory Society 2018. The assessment of the functional state of the respiratory system was carried out by pneumotachography (PTG) using a FlowScreen spirograph with a replaceable high-precision pneumotachograph (Germany). Currently, PTH is one of the most commonly used methods for studying the ventilation function of the lungs (Struchkov P.V. et al., 1996). This is facilitated by the simplicity and reliability of recording the studied parameters, good repeatability and informativeness of the results (Loland L. et al., 2006).

The reliability of the results was assessed using parametric statistics methods. Variables that do not obey the normal distribution law, or the distribution law of which was not determined, were analyzed using nonparametric statistical methods. Nonlinear relationships of binary traits with quantitative and/or qualitative traits were assessed using logistic regression. For these purposes, the package of licensed statistical programs “Statistica” from StatSoft (USA) was used.

Results and discussion

When searching for algorithms for predicting the formation of nicotine dependence of varying degrees depending on smoking experience in the first and second groups of patients, linear and nonlinear methods of regression analysis were used. As a result, the most adequate research objectives turned out to be logit regression models of the relationship between COPD and smoking experience.

Figure 1 shows a logit regression model of the relationship between smoking history and the development of COPD in the first group of patients.

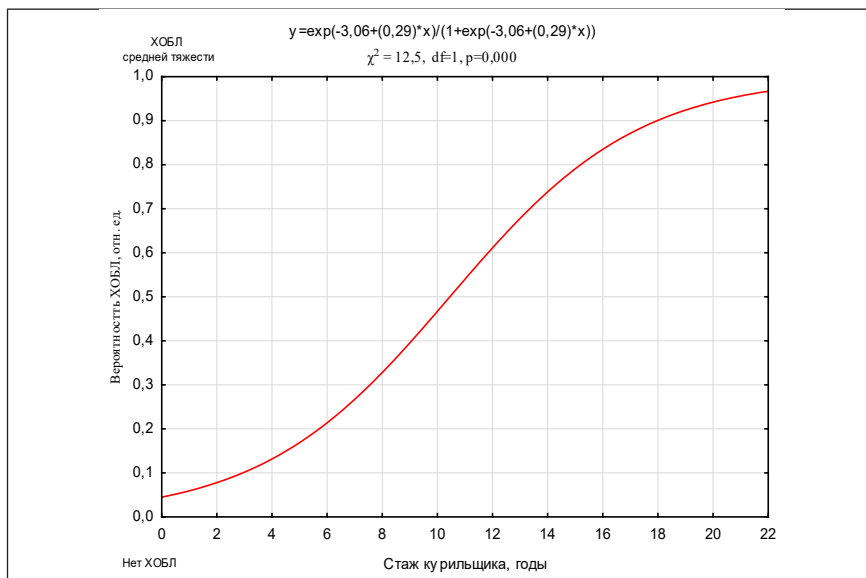


Figure 1. Probabilities of developing COPD in patients combining passive and active smoking (group 1) depending on the smoking experience

This relationship is statistically significant ($\chi^2=12,5$, $p=0,000$) described by the following equation (Quasi-Newton estimation method):

$$P_{\text{ХОБЛ}} = \frac{e^{-3,06+0,28 \times CK}}{1 + e^{-3,06+0,28 \times CK}}$$

where: P^{xobl} - probability of developing moderate COPD (rel. units), CK – smoking experience (years), e – natural logarithm base (approximately equal to 2.718).

As follows from the function presented in the figure, the probability of developing moderate COPD in the first group is in the range $0.04 < P < 0.98$. At the same time, the gradient of the probability that COPD will be formed with different smoking experience increased from 4% in patients with no smoking history to 48% in patients with 10 years of smoking experience and 98% with over 20 years of smoking experience.

Figure 2 shows a logit regression model of the relationship between smoking experience and the development of COPD in the second group of subjects.

This relationship is statistically significant ($\chi^2=26,9, p=0,000$) described by the following equation (Quasi-Newton estimation method):

$$P^{xobl} = \frac{e^{-6.81+0,64 \times CK}}{1 + e^{-6.81+0,64 \times CK}},$$

where: P^{xobl} - probability of developing moderate COPD (rel. units), CK – smoking experience (years), e – natural logarithm base.

In this case, the probability of developing moderate COPD in the second group was in the range $0.00 < P < 1.00$. At the same time, the gradient of the probability that COPD will develop with different smoking experience increased from 0% in patients with no smoking history to 40% in patients with 10 years of smoking experience and 100% with over 20 years of smoking experience.

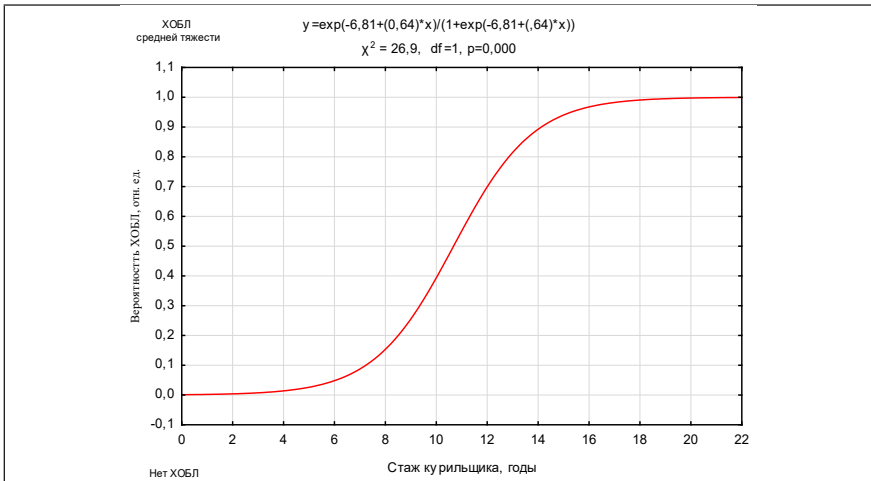


Figure 2. Probabilities of developing COPD in smoking patients (group 2) depending on the smoking experience

When comparing the dependencies analyzed above, it can be noted that in the first group, the formation of COPD occurs faster than in the second group. At the same time, with a smoking history of more than 20 years in both groups, the probability of COPD in both groups is close to 100%, which is confirmed by research by N.M. Shmeleva. with co-authors [13], Sukhovskoy O.A. with co-authors [14], Sakharova G.M. et al. [6].

Conclusions

As a result of the study, it was established that the formation of COPD occurs earlier with an experience of constant active smoking of 4 years in combination with passive smoking and longer without passive smoking - from 6 years of tobacco use. Taking preventive measures will help reduce the burden on the health care system and save resources that may be required to treat more severe stages of COPD. At the same time, it is important to carry out preventive work among smokers, including informing about the dangers of smoking, promoting a healthy lifestyle and active involvement in programs to combat nicotine addiction. This will help prevent the development of COPD and improve the overall quality of life in smokers.

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妊娠吸烟者尼古丁依赖程度与呼吸功能指标相关性评估

**ASSESSMENT OF THE CORRELATION OF THE DEGREE OF
NICOTINE DEPENDENCE AND INDICATORS OF RESPIRATORY
FUNCTION IN PREGNANT SMOKERS**

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注解。为了明确吸烟孕妇尼古丁成瘾程度与外呼吸功能指标之间的关系，在萨马拉市第八临床医院，对尼古丁成瘾程度及其与外呼吸功能指标的关系（以下简称-ESF）对在妇女医院观察的107名吸烟孕妇进行了分析。诊所咨询。吸烟与支气管肺系统疾病的形成之间存在密切关系。随着尼古丁依赖的减少，肺用力肺活量（以下称为FVCL）增加。随着尼古丁依赖程度（以下简称“DND”）从中支气管水平最高程度的下降，ESF 指标出现了统计学上的显著变化，与最大体积流量 50%建立了反向高相关性（以下简称MOS 50）指标在妊娠晚期达到最大值（ $r = - 0.60$ ； $p < 0.050 - 0.000$ ）。

关键词：呼吸功能指标、尼古丁成瘾、育龄妇女、吸烟、妊娠。

Annotation. *In order to identify the relationship between the degree of nicotine addiction and indicators of external respiratory function in smoking pregnant women, at the Samara City Clinical Hospital No. 8, the degree of nicotine addiction and its relationship with indicators of external respiratory function (hereinafter - ESF) in 107 smoking pregnant women observed in the women's hospital were analyzed. clinic consultations. A close relationship has been established between the influence of smoking on the formation of diseases of the bronchopulmonary system. With a decrease in nicotine dependence, an increase in the forced vital capacity of the lungs (hereinafter - FVCL) occurs. A statistically significant change in ESF indicators was revealed with a decrease in the degree of nicotine dependence (hereinafter - DND) from the highest degree at the level of the middle bronchi, an inverse high correlation was established with a maximum volumetric flow rate of 50% (hereinafter referred to as MOS 50) with a maximum value of the indicator in third trimester ($r = - 0.60$; $p < 0.050 - 0.000$).*

Keywords: *respiratory function indicators, nicotine addiction, women of fertile age, smoking, pregnancy.*

Relevance of the problem

The problem of chronic obstructive pulmonary disease (COPD) is relevant for the Russian Federation, including the Middle Volga region of Russia, characterized by developed industry and, as a consequence, an unfavorable environmental situation, however, the main factor shaping the disease of bronchopulmonary pathology is smoking, including including among medical workers [1]. Many factors of smoking are the same for men and women, including similar mortality rates. However, there are areas that are specific only to women and include fertility, birth control, and especially pregnancy.

A study of comparative lung functional parameters in smoking and non-smoking adults, depending on the maternal smoking factor during pregnancy, showed that the pulmonary parameters FVCL and forced expiratory volume in 1 minute (hereinafter referred to as FEV1) were reduced in all tested, regardless of their own smoking. At the same time, the limitation of PEF (peak expiratory flow) was significantly lower in patients born to smokers and only against the background of their own smoking [2, 3]. Thus, it was shown that maternal smoking and own smoking enhance each other’s effect, creating conditions for the development of COPD [4,5].

Purpose of the study: to establish the relationship between the degree of nicotine dependence and indicators of external respiratory function in pregnant women who smoke.

Materials and methods

In the course of our research, using the method of correlation analysis, we assessed the relationship between the degree of nicotine dependence and changes in external respiratory function indicators in each trimester of pregnancy and after childbirth. The indicators were compared with the control group - 42 non-smoking, non-pregnant women.

A group of 107 smokers, pregnant women, without chronic non-infectious diseases, who had not previously been under dispensary observation (N=107).

Table 1
Correlation of the degree of nicotine dependence and forced expiratory volume in the first second in pregnant women who smoke

		Spearman rank correlations (kurenie1.sta)			
removed in pairs					
		Number of sets	Spearman rank		
			R	t(N-107)	p-level.
1st trimester	DND & FEV1	107	-0,57	-10,76	0,000
2nd trimester	DND & FEV1	107	-0,63	-12,65	0,000
3rd trimester	DND & FEV1	107	-0,68	-14,24	0,000

After birth	DND & FEV1	107	-0,58	-11,11	0,000
Control group	DND & FEV1	0			

Analyzing the relationship between the degree of nicotine dependence and FEV1, it was found that the degree of nicotine dependence has a fairly close correlation with FEV1. This relationship is negative, with the highest figures for the Spearman rank correlation index recorded in the third trimester of pregnancy ($r = -0.68$; $p < 0.050-0.000$). This circumstance indicates that with a decrease in nicotine dependence, the FEV1 indicator increases (Table 2).

Table 2
Correlation of the degree of nicotine dependence and FEV1 in pregnant women who smoke

Spearman rank correlations (kurenie1.sta)					
	removed in pairs	Number of sets	Spearman rank		
			R	t(N—107)	p-level
1st trimester	DND & FEV1	107	-0,30	-4,89	0,000
2nd trimester	DND & FEV1	107	-0,47	-8,37	0,000
3rd trimester	DND & FEV1	107	-0,55	-10,26	0,000
After birth	DND & FEV1	107	-0,30	-4,81	0,000
Control group	DND & FEV1	0			

Analyzing Table 2, it can also be noted that DND has a fairly close correlation with FEV1. This relationship is also negative, with the highest figures for the Spearman rank correlation index recorded in the third trimester of pregnancy ($r = -0.55$; $p < 0.050-0.000$). It is safe to say that as nicotine addiction decreases, the FEV1 increases.

Table 3
The relationship between the degree of nicotine dependence and the Tiffno index in pregnant women who smoke

Spearman rank correlations (kurenie1.sta)					
	removed in pairs	Number of sets	Spearman rank		
			R	t(N—107)	p-level.
1st trimester	DND & TIFFNO INDEX	107	-0,54	-9,93	0,000
2nd trimester	DND & TIFFNO INDEX	107	-0,62	-12,25	0,000
3rd trimester	DND & TIFFNO INDEX	107	-0,70	-15,02	0,000

After birth	DND & TIFFNO INDEX	107	-0,47	-8,37	0,000
Control group	DND & TIFFNO INDEX	0			

The Tiffno index has a fairly high inverse correlation with DND. The highest figures for the Spearman rank correlation index were recorded in the third trimester of pregnancy ($r = -0.70$; $p < 0.050-0.000$), which indicates the likelihood of a decrease in DND with an increase in this indicator (Table 3).

Analyzing the indicators of viscous respiratory resistance (hereinafter referred to as Rfo), it should be noted that computer spirometry using the method of forced oscillations and the study of viscous respiratory resistance is accurate, does not require high technological and financial costs, and is a very ergonomic study in primary care for the differential diagnosis of COPD, monitoring the effectiveness of treatment, the validity of therapy.

When conducting a correlation analysis of the relationship between nicotine addiction and viscous respiratory resistance, it was found that DND has an average direct correlation with Rfo indicators ($r = 0.36$; $p < 0.050$) (Table 4). An increase in DND is directly proportional to an increase in endobronchial resistance (obstruction) and impaired compliance of lung tissue (formation of emphysema). With each trimester of pregnancy, Rfo decreases, returning to values tending to normal. Thus, it can be concluded that a decrease in DND reduces endobronchial resistance and increases the elasticity of lung tissue.

Analysis of the indicators of maximum Rfo at the end of inspiration during quiet breathing (Rin) and maximum Rfo at the end of expiration during quiet breathing (Rex) showed that, starting from the second trimester, the indicators increase, while having an average direct correlation with the heart health ($r = 0,47$; $p < 0.05-0.000$), maximally high at the end of expiration, which once again confirms the connection of smoking with the development of obstruction and an increase in endobronchial resistance at the end of inspiration.

Table 4

Correlation of the degree of nicotine dependence and viscous respiratory resistance in smoking pregnant women

	Spearman rank correlations (kurenie1.sta)			t(N—107)	p-level
	removed in pairs	Number of sets	Spearman rank		
			R		
1st trimester	DND & RFO	107	0,36	5,96	0,000
2nd trimester	DND & RFO	107	0,32	5,88	0,000
3rd trimester	DND & RFO	107	0,23	4,66	0,000

After birth	DND & RFO	107	0,21	3,25	0,013
Control group	DND & RFO	0			
1st trimester	DND & RIN	107	0,39	6,12	0,000
2nd trimester	DND & RIN	107	0,36	5,99	0,000
3rd trimester	DND & RIN	107	0,31	5,45	0,000
After birth	DND & RIN	107	0,16	2,51	0,011
Control group	DND & RIN	0			
1st trimester	DND & REX	107	0,47	8,31	0,000
2nd trimester	DND & REX	107	0,36	7,99	0,000
3rd trimester	DND & REX	107	0,31	7,65	0,000
After birth	DND & REX	107	0,25	7,88	0,000
Control group	DND & REX	0			
1st trimester	DND & RHI	107	-0,36	5,28	0,000
2nd trimester	DND & RHI	107	-0,30	5,16	0,000
3rd trimester	DND & RHI	107	-0,23	5,01	0,000
After birth	DND & RHI	107	-0,14	2,01	0,015
Control group	DND & RHI	0			

The phase angle has an average inverse correlation with the degree of nicotine dependence, the highest in the first trimester ($r = -0.36$; $p < 0.05-0.000$), which may indicate a pathological change in breathing in smokers, an increase in endobronchial resistance and a decrease in elasticity lung tissue. With each trimester, this indicator increases, which indicates a decrease in DND, and this is precisely what is associated with the decrease in resistance in the bronchial trunk.

Considering the relationship between DND and speed indicators MOS 25—MOS 75, an inverse average correlation relationship with MOS 25 was established with the maximum value of the indicator in the third trimester ($r = -0.44$; $p < 0.05-0.000$), an inverse high correlation relationship with MOS 50 with the maximum value of the indicator in the third trimester ($r = -0.60$; $p < 0.05-0.000$) and an inverse average correlation with MOS 75 with the maximum value of the indicator in the third trimester ($r = -0.44$; $p < 0.05-0.000$) (Table 5).

Table 5

Correlation of the degree of nicotine dependence and speed indicators at the level of large, medium and small bronchi in smoking pregnant women

		Spearman rank correlations (kurenie1.sta)			
		removed in pairs			
		Number of sets	Spearman rank		
			R	t(N—107)	p-level

1st trimester	DND & MOS_25	107	-0,33	-4,65	0,000
2nd trimester	DND & MOS_25	107	-0,38	-4,98	0,000
3rd trimester	DND & MOS_25	107	-0,44	-5,11	0,000
After birth	DND & MOS_25	107	0,35	-4,87	0,011
Control group	DND & MOS_25	0			
1st trimester	DND & MOS_50	107	-0,46	-6,66	0,000
2nd trimester	DND & MOS_50	107	-0,51	-6,87	0,000
3rd trimester	DND & MOS_50	107	-0,60	-6,91	0,000
After birth	DND & MOS_50	107	-0,46	-5,41	0,024
Control group	DND & MOS_50	0			
1st trimester	DND & MOS_75	107	-0,36	-4,21	0,000
2nd trimester	DND & MOS_75	107	-0,39	-4,65	0,000
3rd trimester	DND & MOS_75	107	-0,44	-5,22	0,000
After birth	DND & MOS_75	107	-0,29	-4,12	0,019
Control group	DND & MOS_75	0			

These facts indicate that with a decrease in DND, speed indicators increase to a greater extent at the level of the middle bronchi.

Conclusions

This study once again confirmed the close relationship between the influence of smoking on the formation of diseases of the bronchopulmonary system, which corresponds to literature data [1, 4]. These studies revealed that in patients with a decrease in nicotine dependence, there is an increase in FEV1, which is confirmed in studies from 2010 [2]. The study found that as nicotine addiction decreases, the FVCL increases. A statistically significant change in ESF indicators was established with a decrease in DND from the highest degree at the level of the middle bronchi; an inverse high correlation was established with MOS 50 with the maximum value of the indicator in the third trimester ($r = -0.60$; $p < 0.05-0.000$).

Summarizing the presented data, it is necessary to emphasize once again that in order to optimize the diagnosis and treatment of COPD in smokers, it is necessary to take into account the clinical features of the formation of COPD with varying degrees of nicotine dependence, evaluate the possibilities of correcting nicotine dependence, together with the use of basic therapy, as well as using quitting schools from smoking. Thus, eliminating one of the main risk factors for the development of the disease makes it possible to slow down the progression of the disease and preserve the subsequent health of the future generation without using high-tech expensive methods.

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吸烟在复杂产科病史形成中的作用
**THE ROLE OF TOBACCO SMOKING IN THE FORMATION OF A
COMPLICATED OBSTETRIC HISTORY**

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抽象的。 本研究的目的是研究吸烟与有产科负担史（以下简称 BOH）的女性的关系，该病史在 ICD-10 中分类为 Z-35.2（监测有另一负担产科史的妇女的妊娠过程）与分娩或其他产科问题相关的病史）及其特殊情况：药物流产和自然流产。 该研究基于在产前诊所观察到的 107 名吸烟女性和 136 名不吸烟女性的妊娠检测结果。 研究患者的选择是采用随机抽样方法进行的，该方法满足所研究人群的代表性要求。 研究发现，与不吸烟者相比，吸烟女性的流产和堕胎数量有所增加。 通过医疗机构识别吸烟的育龄女性、主动识别吸烟的孕妇以及家庭中吸烟的亲属，并实施减少吸烟的措施，将显著降低生育患有慢性病的孩子的可能性。 使用参数统计方法评估结果的可靠性。

关键词：吸烟、育龄妇女、复杂产科史、药物流产、自然流产。

Abstract. *The purpose of the study is to study the relationship of tobacco smoking in smoking women with a burdened obstetric history (hereinafter referred to as BOH), classified in ICD - 10 as Z - 35.2 (monitoring the course of pregnancy in a woman with another burdened history related to childbirth or other obstetric problems) and its special cases: medical and spontaneous abortions. The study was based on the results of testing of 107 smoking women and 136 non-smoking women observed in a antenatal clinic for pregnancy. The selection of patients for the study was carried out using a random sampling method that met the requirements of representativeness in relation to the population being studied. The study found an increase in the number of miscarriages and abortions in women who smoke compared to non-smokers. Identification of smoking women of fertile age when attached to a medical organization, active identification of pregnant women who smoke, as well as smoking relatives in the family, and implementation of measures to reduce tobacco smoking will significantly reduce the likelihood of having children with chronic pathology. The reliability of the results was assessed using parametric statistics methods.*

Keywords: *smoking, women of fertile age, complicated obstetric history, medical abortions, spontaneous abortions.*

Introduction. The prevalence of tobacco smoking among girls in the Russian Federation is high and continues to increase. According to the global epidemiological study on tobacco, among girls aged 13-15 years (2003), 61.3% have tried smoking, and 29.8% constantly use any tobacco products. 6.1% regularly use other tobacco products. The frequency of active smoking among girls studying at lyceums is 19%, and among students at vocational schools – 31%. The prevalence of tobacco smoking among antisocial adolescents (homeless) is 100% [1]. In addition, the risk of developing bronchial hyperreactivity is higher in women during the reproductive period, when cyclical changes in the respiratory tract are observed, which suggests a special role of women's hormonal levels in the development of predisposition to diseases of the respiratory system [2, 3, 4]. Despite the smaller size of the lungs, the absolute and diameter-corresponding values of forced expiratory flows, as well as the ratio of FEV₁ to FEV₂₅₋₇₅, are determined to be higher in women than in men throughout life [5, 6]. Currently, other, no less substantiated information has been accumulated about the significant prevalence of smoking among pregnant women in all countries of the world. The increased frequency of spontaneous abortions, neonatal mortality and subsequent slow development of newborns in smoking mothers is associated with premature separation of the placenta and large placental infarctions, with fetal hypoxia. Cases of placental abruption, placenta previa, and extensive placental infarctions are the most common causes of fetal and neonatal mortality in mothers who smoked during pregnancy [7].

Purpose of the study: to study the relationship of tobacco smoking in women who smoke with a burdened obstetric history, classified in ICD - 10 as Z - 35.2 (monitoring the course of pregnancy in a woman with another burdened history relating to childbirth or other obstetric problems) and its special cases: medical and spontaneous abortions.

Object and methods of the study: The study was based on the results of testing 107 smoking women and 136 non-smoking women observed in a antenatal clinic for pregnancy. The reliability of the results was assessed using parametric statistics methods.

Results and discussion: During the study, it was found that out of 107 pregnant smokers, a burdened obstetric history (BOH) was identified in 59% of the subjects. It should be noted that our concept of BOH includes induced childbirth, single or multiple abortions, miscarriages, anomalies of placental attachment and its premature detachment, injuries of the birth canal, adhesions on the fallopian tubes, scars on the uterus, threats of uterine rupture during previous births, fetal asphyxia (when the umbilical cord is wrapped around the neck) or stillbirth.

The data obtained have an average direct correlation with smoking (Table No. 1). The longer the period of tobacco use continues, the greater the likelihood of developing a burdened obstetric history.

Table №1

Distribution of special cases of BOH in groups of smoking and non-smoking patients

variables	obs.	R	T (N-107)*	p-levels.
OBSTETRIC HISTORY & SMOKING	107	0,37	6,64	0,000
Q QUANTITY OF MEDICAL ABORTIONS & SMOKING	107	0,34	6,12	0,000
NUMBER OF CONTROLLED ABORTIONS & SMOKING	107	0,14	2,38	0,018
CANALIS PARTURIENTIS INJURIES & SMOKING	107	0,25	2,49	0,028
ANOMALY OF ATTACHMENT AND PREMATURE ABSOLUTION OF THE PLACENTA & SMOKING	107	0,37	4,52	0,048
SCARS ON THE UTERUS, THREATS OF UTERUS RUPTURE & SMOKING	107	0,13	5,22	0,034

*where T is the test for independent samples (dinamika.sta).

N — number of patients examined

It should be noted that in the group of smoking women, 51.4% had BOH, which included one or more of its component indicators, compared with the group of non-smoking women - 18.8%. Thus, in the group of smoking women, virtually every second patient has BOH, in contrast to non-smoking women - every 5 patients (Table No. 2).

The number of medical and spontaneous abortions, injuries of the birth canal, anomalies of location and placental abruptions in smoking patients is actually 2-3 times higher than the presence of these indicators in non-smoking women, which indicates a greater likelihood of deviation from a normal pregnancy and the birth of a child with pathology.

Table №2

The relationship between smoking and special cases of BOH

INDICATOR	In women who smoke (n=107)	In women who doesn't smoke (n=136)	Probability of error p
OBSTETRIC HISTORY & SMOKING	51,4%	18,8%	0,001
QUANTITY OF MEDICAL ABORTIONS	47,3%	9,8%	0,005
NUMBER OF CONTROLLED ABORTIONS	25,7%	7,1%	0,002
CANALIS PARTURIENTIS INJURIES	34,8%	8,8%	0,006

ANOMALY OF ATTACHMENT AND PREMATURE ABSOLUTION OF THE PLACENTA	33,9%	11,7%	0,004
SCARS ON THE UTERUS, THREATS OF UTERUS RUPTURE	12,8%	5,1%	0,05

Conclusion. Based on a generalization of the study results, we can conclude that smoking has an adverse effect on a woman's reproductive function. In women who smoke, the likelihood of an abnormal pregnancy, its complications, complications of childbirth and the birth of a child with pathology increases. It is at the outpatient stage that work with risk factors, namely smoking, will reduce the risks of developing these complications during pregnancy. The direct participation of a general practitioner and obstetrician-gynecologist is paramount in the prevention of harmful factors.

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吸烟影响下女性血液流变特性的变化特征

**FEATURES OF THE CHANGE IN RHEOLOGICAL PROPERTIES
OF BLOOD IN WOMEN UNDER THE INFLUENCE OF TOBACCO
USE**

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抽象的。 该研究的目的是研究吸烟与育龄妇女血液流变成成分变化之间的关系。 在萨马拉市第八医院,对在诊所产前门诊观察的 107 名吸烟和 136 名不吸烟育龄妇女进行了血细胞计数结果研究。 研究发现,吸烟有助于缩短血液凝固时间,增加血液中红细胞和血红蛋白的数量。 在吸烟的影响下,血液的凝固活性增加。 戒烟会导致血细胞比容、血红蛋白浓度降低。 通过 OPI 识别吸烟的育龄妇女、积极识别吸烟的青少年以及家庭中吸烟的亲属,并实施减少吸烟的措施,将显著降低严重慢性多器官病变的可能性。

关键词: 吸烟、血液流变特性、血红蛋白、红细胞、凝血时间、血小板。

Abstract. *The purpose of the study is to study the relationship between smoking and changes in the rheological composition of the blood of women of fertile age. At the Samara City Hospital No. 8, the results of blood counts were studied in 107 smoking and 136 non-smoking women of fertile age, observed in the antenatal clinic of the clinic. The study found that smoking helps reduce blood clotting time, increase the number of red blood cells and hemoglobin in the blood. Under the influence of smoking, the coagulating activity of the blood increases. Quitting smoking causes a decrease in hematocrit, hemoglobin concentration. Identification of smoking women of fertile age when attached to OPI, active identification of smoking adolescents, as well as smoking relatives in the family, and implementation of measures to reduce tobacco smoking will significantly reduce the likelihood of severe chronic multiple organ pathology.*

Keywords: *smoking, rheological properties of blood, hemoglobin, red blood cells, blood clotting time, platelets.*

The blood system is one of the most important systems of the body. There is numerous data on changes in the quantitative and qualitative composition of the blood, on an increase in hematocrit, the number of red blood cells, the average

content of hemoglobin in them, their average volume and, finally, the number of leukocytes in the blood of smokers. Nicotine directly proportionally affects the thrombus-forming ability of thrombin and accordingly increases blood viscosity. In smokers, the number of red blood cells, hematocrit, and hemoglobin concentration are slightly increased. In individuals in this category, an increased number of leukocytes, both polymorphonuclear leukocytes and lymphocytes, is determined. Stopping smoking causes a decrease in hematocrit and hemoglobin concentration.

The mechanism of action of nicotine in vitro was studied by J. Singh and V. Oester (1964). The addition of nicotine to human plasma, even in minimal concentrations, lengthened the prothrombin time, and with the combined administration of nicotine and heparin, some combinations lengthened and others shortened the prothrombin time. J. Singh and M. Singh (1975) showed in an experiment that nicotine affects the thrombus-forming ability of thrombin in proportion to the dose [1].

Indicators of blood and plasma viscosity, as well as changes in the shape of erythrocytes, are the determining factors of vascular and especially capillary blood flow, and it can be considered that pathological changes in the latter cause disturbances in the nutritional state of various organs [2, 3].

Many studies have shown that increased hematocrit is the cause of increased blood viscosity. In addition, smokers experience an increase in plasma fibrin content and a decrease in fibrinolytic activity of the blood, which promotes erythrocyte aggregation and may cause increased blood viscosity.

Summarizing the hemorheological changes found in women who smoke, it should be noted that the viscosity of blood and plasma, as well as hematocrit and fibrinogen, increase with smoking. The reduced ability of red blood cells to deform should also be taken into account. Whether these abnormal changes are the only cause of angiopathy, which develops much more often in smokers, is not yet completely clear, but the fact that they are important is beyond doubt [4].

Purpose of the study: to establish the relationship between smoking and changes in the rheological properties of blood.

Object and methods of research: The study is based on the results of studying the rheological properties of blood at the pregestational stage in 107 smoking women and 136 non-smoking women observed in a antenatal clinic. The reliability of the results was assessed using parametric statistics methods.

Results and discussion: The data obtained have an average direct and fairly close correlation with smoking (Table No. 1). The longer the period of tobacco use continues, the greater the likelihood of developing changes in the viscosity of the blood.

Table №1

The relationship between smoking and blood parameters

variables	observed	R	t-criteria	p-level
Hemoglobin	107	0,47	7,64	0,000
Hematocrit	107	0,34	6,12	0,000
Color indicator	107	0,24	2,38	0,018
Red blood cells	107	0,44	6,99	0,000
Platelets	107	0,38	6,16	0,007
Blood clotting time according to Sukharev	107	0,65	6,54	0,000
Prothrombin index	107	0,44	5,21	0,011
Fibrinogen	107	0,21	2,11	0,023

The study found that 107 smokers had an increased number of red blood cells, hemoglobin, hematocrit, platelet concentration and blood clotting time according to Sukharev in comparison with non-smoking women (Table No. 2). This difference is reliable and statistically significant.

Table №2

Comparative analysis of blood parameters in a group of smoking and non-smoking women

INDICATOR	In women who smoke (n=107)		In women who doesn't smoke (n=136)		Probability of error
	M	m	M	m	p
Hemoglobin	138,2	±1,21	123,4	±1,11	0,05
Hematocrit	41,3	±0,29	36,1	±0,35	0,05
Color indicator	0,99	±2,32	0,85	±1,98	0,05
Red blood cells	4,3	±0,33	3,9	±0,27	0,05
Platelets	313,2	±4,36	265,2	±5,33	0,004
Blood clotting time according to Sukharev	4,9	±0,56	3,6	±0,48	0,05
Prothrombin index	94,2	±6,25	78,9	±4,87	0,002
Fibrinogen	3,8	±0,54	3,1	±0,41	0,05

Conclusion. Based on a generalization of the research results, we can conclude that smoking has an adverse effect on blood indicators in women, which in turn leads to serious multiple organ disorders, problems with pregnancy and the development of chronic pathology in offspring at earlier stages of development. In women who smoke, the likelihood of abnormalities in the course of pregnancy, its complications, complications of childbirth and the birth of a child with the presence of pathology increases. It is at the outpatient stage that work with risk

factors, namely smoking, will reduce the risks of developing these complications during pregnancy.

Conclusions: Identification of smoking women of fertile age when attached to OPI, active identification of smoking adolescents, as well as smoking relatives in the family, and implementation of measures to reduce tobacco smoking will significantly reduce the likelihood of severe chronic multiple organ pathology. It is necessary to carry out preventive measures, including the organization of schools for the treatment of tobacco addiction in primary care. Identification of smoking women of fertile age when attached to OPI, active identification of smoking adolescents, as well as smoking relatives in the family, and implementation of measures to reduce tobacco smoking will significantly reduce the likelihood of severe chronic multiple organ pathology.

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人格在中俄关系史上的作用

THE ROLE OF PERSONALITY IN THE HISTORY OF RUSSIAN-CHINESE RELATIONS

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抽象的。 本文献给俄罗斯麻醉学创始人之一维克多·普罗科普耶维奇·斯莫尔尼科夫 (Victor Prokopjevich Smolnikoff)。 阐述了副总统斯莫尔尼科夫传记的主要事实； 引用了他的著名同时代人 AI Saltanov, AP Zilber, NE Burov 的纪念馆。 介绍了维克多·斯莫尔尼科夫的研究出版物——“简单的空灵麻醉”、“当代吸入麻醉”等——以及他的哲学和文学作品的信息。 本文配有真实文献照片，反映了斯莫尔尼科夫一生的主要时刻以及麻醉学作为新的临床和科学医学领域形成的里程碑。

关键词：历史医学、20 世纪、麻醉学。

Abstract. *The article is devoted to one of the founders of anesthesiology in Russia, Victor Prokopjevich Smolnikoff. The main facts of VP Smolnikoff biography are set out; memorials of his famous contemporaries AI Saltanov, AP Zilber, NE Burov are cited. Information about research publications of Victor Smolnikoff - "Simple ethereal narcosis", "Contemporary inhalational narcosis", etc. - and his philosophical and literary works is presented. The article is illustrated with photo of authentic documents reflecting the main moments of Smolnikoff's life and milestones of anesthesiology formation as a new clinical and scientific field of medicine.*

Keywords: *history medicine, 20th Century, Anesthesiology.*

In 2014, it was the 100th anniversary of the birth of Viktor Prokopyevich Smolnikov - a doctor of medical sciences, the first non-staff chief anesthesiologist

of the Ministry of Health of the USSR, one of those who created the independent specialty of “anesthesiology” in our country from specialists who were previously referred to as “anesthetist”, an honorary member of the Moscow Society of Anesthesiologists (MSOA), and a professor of therapy at the Jesuit University “Aurora” (Shanghai, China). (Fig.1).



Figure 1. Saint Peter's Church and buildings of Catholic University "Aurora" in Shanghai, photo of 30-thies.

V.P. Smolnikov was also a life member of the Royal Society of Medicine of Great Britain, a member of the Royal Society of Medical Practitioners of England, and an honorary member of the Society of Anesthesiologists of England and Ireland. We were lucky to hear the biography of Viktor Prokopyevich Smolnikov from his contemporaries Alexander Iosifovich Saltanov, Nikolai Evgenievich Burrov, Anatoly Petrovich Zilber and son V.P. Smolnikov - Pavel Smolnikov. A.P. Zilber gave us personal correspondence from the 60-80s of the last century with V.P. Smolnikov, which is of separate historical and artistic interest. Fragments of this correspondence are part of the exhibition of the Museum of Medicine at the First Moscow State Medical University named after I.M. Sechenov, dedicated to the memory of Viktor Prokopyevich Smolnikov. In the retelling of events from the life of V.P. Smolnikov, we have preserved the epithets addressed to this man by colleagues and friends, so as not to lose their special, emotional, truly friendly admiration for his personality. Viktor Prokopyevich Smolnikov (1914-1994) was born in Harbin and lived for many years in China, graduated from St. Louis College in Tianjin and the French Jesuit Aurora University in Shanghai, and then worked as a doctor for 14 years in the British Medical companies. In 1946, after numerous refusals, Viktor Smolnikov, by this time a professor of medicine, was granted Soviet citizenship, and in 1954 he was allowed to enter the USSR among those who agreed to develop virgin lands. “Half of the life lived in China is not a

travelogue of a carefree wandering boy, but of a husband, a father of a large family (see fig. 2), who has lived through and witnessed two world wars, several revolutions, numerous local conflicts, the polio epidemic after World War II, which he fought against and which affected half of his children in 1948, and many other events during the course of half a century. What is half a life? It is half a blink of the human soul's existence on our sinful Earth. Oh, what turbulent times it was! The first half of the twentieth century and so is the biography of our hero, turbulent as well, with its ups and downs, joys, cares, difficulties, and paradoxes, oh so many paradoxes... After World War II, the large family scattered in different directions. In short, 'three generations crossed the earth with graveyards...' - writes P.V. Smolnikov in his memoirs, in the preface he prepared upon our request for the second edition of the book 'Notes of a Shanghai Doctor' (2014)



Figure 2. V.P. Smolnikoff with his wife. Shanghai, 1946.

His first book by V.P. Smolnikov wrote while still studying at the university, in his third year, and it was a monograph entitled "On the Control of Child-birth." Of course, the contents of the book will cause a mixed reaction among modern readers, since the author was influenced by religious and philosophical beliefs in accordance with Catholic doctrine. But let's not forget that the book was written in China at the end of the 30s of the last century, when birth control was extremely relevant, and, in addition, reflects the level of medical science for that period of time when there were no effective and safe contraceptives. Interestingly, the book received favorable assessment of the rector of the Catholic University "Aurora", prof. R. Germain. In 2014, we, together with the staff of the Institute of Oriental Studies of the Russian Academy of Sciences, translated this book from the literary Russian language of the 19th century into

modern Russian and published it on the occasion of the anniversary - the 100th anniversary of the birth of V.P. Smolnikov. After graduating from the university V.P. Smolnikov was engaged in private medical practice at the firm Doctors Marshall, Jackson & Partners (Fig. 3).

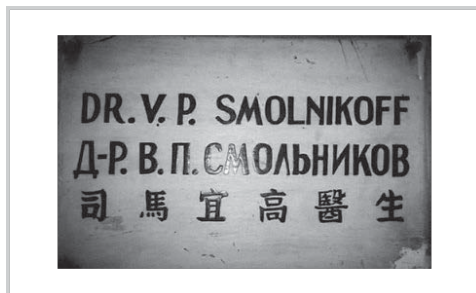


Figure 3. The sign on the door of the reception of VP Smolnikoff.

In addition, Viktor Prokopyevich became a professor at Aurora University and taught therapy for a long time. He also tried his teaching experience on his children, who were distinguished by their curiosity, and whom he sent to study from the age of 4 - his eldest daughter to the college at the Convention of Ursuline Sisters in Harbin, and his sons to the French College of St. Joan of Arc. N.E. Burov recalls: "In 1952-1953, V. Smolnikov wrote the book "Simple Ether Anesthesia," which was sent by Prof. E.N. Meshalkin to Moscow, and which will become his "calling card" in the USSR, will later be defended by him as a candidate's dissertation and will actually determine the entire further direction of his work in the field of medicine in his homeland." Subsequently V.P. Smolnikov successfully defended his doctoral dissertation. Paradoxically, the author himself did not have access to his own work, since he never had permission to work with classified materials. In the USSR, in contrast to his professional activities in Shanghai as a professor at the Faculty of Medicine at Aurora University and general practitioner V.P. Smolnikov devoted himself entirely to anesthesiology. He was among those people, thanks to whose efforts a new medical specialty appeared in the Soviet Union - anesthesiology and resuscitation. Leaving a prosperous life in Shanghai, V.P. Smolnikov came to the USSR, where he was forced to start everything almost from scratch. The move to the Soviet Union itself had long been a conscious decision for Viktor Smolnikov, but official permission to enter was received only in 1954. This was a time when, after Mao Zedong came to power, almost all foreigners were forced to leave China. According to the stories of Viktor Prokopyevich's son, Pavel, before leaving, representatives of the Chinese authorities came to the Smolnikovs with a search. Russian emigration

rushed back to Russia, but, strictly speaking, V.P. Smolnikov was not an emigrant at all. His grandfather Pavel Aleksandrovich Farafontov came to Manchuria back in the 90s of the 19th century to build the Chinese Eastern Railway. Neither Viktor Prokopievich nor his parents have ever been to Russia. After arriving in the USSR, for 1 year Smolnikov lived with his family (and he had 6 children) in a village near Novosibirsk, in a cold room where there used to be a barn, and did not have the opportunity to work in his specialty. Despite this, being a general worker at the Ubinsk dairy farm, V.P. Smolnikov provided medical helping your comrades. After the lapse of time in the characteristics of V.P. Smolnikov, signed by the director of the Institute of Thoracic Surgery, Academician A.N. Bakulev, it will be stated:

“... he worked as a doctor in the village of Ubinskoye,” although in fact Smolnikov was a dairy farm worker, but, having medical knowledge, he provided medical assistance to everyone who sought it. Viktor Prokopievich even brought a portable X-ray machine with him from Shanghai, so he had to become an X-ray laboratory assistant and a part-time radiologist. However, these were V.P.’s own undertakings. Smolnikov, he never officially held the position of doctor in the village of Ubinskoye. V.P. Smolnikov did not lose heart even in this difficult time, and soon his book “Simple Ether Anesthesia” was appreciated and he received an invitation to the Institute of Thoracic Surgery of the USSR Academy of Medical Sciences. In 1956, Viktor Smolnikov created the first anesthesiology laboratory in our country and from that moment connected his life with a completely new field of medicine. First of all, V.P. Smolnikov faced the task of conducting anesthesia during operations on the chest organs, including cardiac surgery. In 1959, another monograph was published in collaboration with the famous surgeon E.N. Meshalkin “Modern inhalation anesthesia.”

A new stage in the life of V.P. Smolnikov began working at the Research Institute of Experimental and Clinical Oncology of the USSR Academy of Medical Sciences as head of the anesthesiology laboratory. In 1961 V.P. Smolnikov was appointed chief freelance anesthesiologist of the USSR Ministry of Health. From the memoirs of A.I. Saltanov: “Over the many years of work in the USSR, Professor Smolnikov raised a galaxy of students who successfully worked in all the union republics. Throughout his years of intensive work, he always demonstrated an interest in everything new, trying to optimize and promote the latest methods of general anesthesia.”

Viktor Prokopievich Smolnikov proved himself in several areas of anesthesiology - inhalation general anesthesia in thoracic surgery, cardiac surgery, anesthesia in oncology surgery, emergency anesthesiology. In his works, he paid much attention to the issues of myoplegia and the interaction of several components of general anesthesia. In 1962, during exploratory laparotomy V.P. Smolnikov

together with L.N. Buachidze was given the first xenon anesthesia in the USSR. V.P. Smolnikov was the author of the first “Handbook of Anesthesiology” in our country, published in 1965. Soon Viktor Smolnikov became a recognized authority not only in the USSR, but also abroad, the most famous anesthesiologists of that time were Sir Robert Mackintosh (Great Britain), Silvan Shane, John Bonica, Henry Beecher, Paul Safar (USA) were his friends (Fig. 4).



Figure 4. EN Meshalkin, VP Smolnikoff, R. Makintosh, 1956.

Smolnikov was brilliantly educated, knew several European languages, was fluent in Chinese, and had a broad outlook.

V.P. Smolnikov was not only a wonderful doctor, scientist, but also a writer. Many of his works, unfortunately, have not been published. The work of his entire life, a memoir entitled “Notes of a Shanghai Doctor,” was published only in 2001. Reading the “Notes” immerses the reader in the extraordinary world of the Far East of the first half of the XX century, filled with such details and details that cannot be gleaned from ordinary historical sources. A number of unique cases from the author’s medical practice are also given. Interestingly, this book was also published in English (“The Diary of a Shanghai Physician”). Despite numerous attempts to edit V.P. Smolnikov personally and other persons of this work in the spirit of “socialist realism”, he never managed to publish his memoirs during his lifetime in the conditions of the Soviet Union. A.P. Zilber recalled: “His friend Yakov Marshak told V.P. Smolnikov that he will be able to publish his books only after his death.” And so it happened. In books written by V.P. Smolnikov, pictures of the past come to life that are completely unknown to Russian readers, including life in China in the first half of the 20th century, the years of Japanese occupation, as well as interesting everyday features of that time, cases from medical practice, and descriptions of trav-

el. Viktor Prokopievich's keen observation, his ironic view of the events that happened to him and around him, his cheerful disposition and sense of humor make his memories unique.

The unique history, documents, artifacts of life in Shanghai in the middle of the last century and the birth of domestic anesthesiology on the territory of "Asian Babylon" will allow you to plunge into the atmosphere of those years and experience the amazing life story of Viktor Prokopyevich Smolnikov. This life was incredible, containing the exoticism of the East, the formation of the schools of Prince Golitsyn in Harbin and San Luis in Tianjin, the study of Neo-Malthusianism and the philosophical and scientific condemnation of childbirth control, the smell of ether and a mansion on the Bund, the respectability of bourgeois life and the tragedy of war, the change of four political regimes, longing for the historical homeland, rifles of the Japanese occupiers and searches under the regime of Mao Zedong, the realities of life at the Siberian dairy farm and the formation of domestic anesthesiology. V.P. Smolnikov was truly that rare Person whose ordeals combined history, science, the literary heritage of Russian-Chinese relations, Russian patriotism with the Soviet atmosphere of true collectivism and camaraderie. This is the global history of V.P. Smolnikov - the first Russian professional anesthesiologist.

实验中颌面部感染炎症过程的一些发病机制

**SOME PATHOGENETIC ASPECTS OF THE INFECTIOUS-
INFLAMMATORY PROCESS OF THE MAXILLOFACIAL AREA IN
THE EXPERIMENT**

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注解。 该工作致力于在实验中机体细菌致敏性增强的背景下研究颌面部感染炎症过程的发生机制。

关键词：实验动物、感染、致敏、炎症、过敏试验。

Annotation. *The work is devoted to studying the mechanism of development of the infectious-inflammatory process in the maxillofacial area against the background of increasing bacterial sensitization of the body in experiment.*

Keywords: *experimental animals, infection, sensitization, inflammation, allergy tests.*

Relevance

As is known, inflammation and hypersensitivity are coupled processes, and in the field of human pathology they are in a cause-and-effect relationship. Their connecting link is immunity. The relationship between inflammation and hypersensitivity, as well as the autoimmunization that accompanies them, determines the wave-like course of the chronic inflammatory process [1].

The state of the body's immunological reactivity is the most important factor in the pathomorphism of inflammatory diseases and the maxillofacial region (MFA) [2, 3, 4]. At the same time, the role of sensitization mechanisms to antigens of "lo-

cal" microflora is undoubted, which allows us to consider acute inflammation of odontogenic etiology as the result of a hyperergic reaction of the body, mediated by the mechanisms of delayed-action hypersensitivity (DTH) and immediate-type hypersensitivity (IAT) [5,6,7].

However, since the discussion of general conceptual issues of inflammation is still ongoing, the study of some fundamental aspects of bacterial sensitization of the body in the clinical course of purulent-septic infection in the maxillofacial area for the analysis of existing medical and biological theories, as well as the development of new scientific approaches and concepts, seems relevant.

The purpose of the work was studying the nature of the course of the infectious-inflammatory process in the maxillofacial area under conditions of specific bacterial sensitization of the body of varying degrees in the experiment.

Material and research methods

In order to substantiate the role of the infectious-inflammatory process of the maxillofacial area in sensitization and intoxication of the body, the experimental study was carried out in 2 stages: at stage 1, the model of osteomyelitis of the lower jaw and purulent inflammation of the admaxillary soft tissues was reproduced; at the 2nd stage - the level of bacterial sensitization of the body of experimental animals with clinical manifestations of the disease was studied.

Experimental purulent-destructive inflammation of the lower jaw and admaxillary soft tissues was reproduced according to the original method we developed (pre-patent No. 19378, application No. 2006~1256.1 dated November 14, 2006), on 100 male guinea pigs in the spring-summer period. The weight of laboratory animals was 475.0 ± 25.0 g.

The reproduction of the model of the infectious-inflammatory process in the maxillofacial area was carried out on the basis of the immunological laboratory of the Scientific Center of West Kazakhstan State Medical Academy named after Marat Ospanova (Head Associate Professor B.V. Zasorin).

The material for infection was a microbial suspension of a daily culture of *St. aureus* FDA 209-P, containing 1 billion microbial bodies in 1.0 ml. The animals were sensitized by single, double, triple and quadruple injection of 0.5 ml of a microbial suspension of a daily culture of *St. aureus* FDA 209-P, containing 1 billion microbial bodies in 1.0 ml, and exposure to the source of infection with a direct electric current of positive polarity, with a force of 5-10 μ A for 3-5 minutes, under general ether anesthesia. The interval between the 1st and 2nd, between the 2nd and 3rd, and between the 3rd and 4th administration of the bacterial infection was 7 days. The injection of a resolving dose of staphylococcal antigen into the primary infectious focus was carried out on the 7th, 14th, 21st and 28th days in a volume of 0.5 ml and a concentration of 0.5 billion microbial bodies (mt/ml).

During the study, 4 groups of experimental animals were formed (20 pigs in each): I – animals with four times infection, II – with three times infection, and III – with two times infection. Animals with a single infection made up group IV (Table 4).

20 intact animals served as controls for this series of experiments, 5 of which were removed from the experiment at the appointed time of the study.

Table 4
Distribution of experimental animals by groups

Groups	Frequency of reference St. aureus	Timing of administration of the permissive dose	Deadlines removing animals from experience
I (n=20)	Quadruple (1-7-14-21 days)	28th day	35th day
II (n=20)	Three times (1-7-14 days)	21st day	28th day
III (n=20)	Twice (0-7 days)	14th day	21st day
IV (n=20)	One time (1 day)	7th day	14th day

The development of an infectious-inflammatory process in the jaw and admaxillary soft tissues was assessed according to the following criteria:

1. Clinical manifestations - the nature of local signs of an infectious-inflammatory reaction: the size and area of soft tissue infiltration in the area of inflammation, necrotization, timing of the formation of external fistulas, the nature of the discharge.
2. X-ray examination - computer radio-visiography was carried out using a “Trophy” device (France, 03/09/04, GRIX 70 CCX) with an NFCXH-177 cathode ray X-ray tube.
3. Laboratory tests - general blood test, leukemia formula. In addition, tests were used to assess the immunological resistance of experimental animals: total leukocytes, T-lymphocytes and their subpopulations Ttph and Ttfr (T-suppressors and T-helpers), B-lymphocytes, O-lymphocytes were determined - the functional response of T-, B-lymphocytes on stimulation by nonspecific mitogenic PHA and LPS, neutrophil phagocytosis, the level of circulating immune complexes (CIC).

Blood sampling was carried out by intracardiac puncture under general ether anesthesia.

The immunological status was studied according to generally accepted methods.

The functional activity of T- and B-lymphocytes was assessed in reaction with nonspecific mitogens.

The level of sensitization was assessed by proven leukocyte allergy tests in vitro: the specific leukocyte agglomeration reaction (SLAR), the specific leukocyte lysis reaction (SLLR), the mast cell degranulation reaction (MCDR) [7] and the specific blast transformation reaction (SBTR) [8].

Research results

Clinical trial results

During the study, it was established that in all animals of groups I, II, III, IV, at the site of administration of the permissive dose of the microbial culture, an infectious-inflammatory process of varying severity and prevalence developed, depending on the frequency of administration of the bacterial agent. Moreover, the body's response in all animals reached its maximum on the 2nd day after infection.

The development of an infectious-inflammatory process in the maxillofacial area in infected animals was evidenced by the clinical picture of the disease, manifested in increased body temperature, drowsiness and lethargy, lack of appetite, and physical inactivity. Before the start of the experiments, the basal body temperature of guinea pigs was $37.8 + 0.07$; by the end of the first day after the introduction of the microbial culture, it increased to $39.8 + 0.24$ ($P < 0.001$).

External symptoms of acute purulent inflammation in the maxillofacial area were observed in some guinea pigs of groups I and II already on the 2nd day after infection, and subsequently, with great consistency in all animals - almost until the end of observation. At the same time, the animals became unpleasant in appearance, "emaciated," their fur became disheveled and dull. These phenomena were most clearly observed from 3 to 9 days after infection, and especially in animals with four- and three-time administration of the bacterial agent. At the same time, the death of animals was recorded (in 1.5% of cases) due to the development of bacterial shock.

Objectively, all this was manifested by a shortening of the acute phase of the purulent-inflammatory process and its rapid chronicization. Moreover, an assessment of the dynamics of the development of local signs of inflammation of the maxillofacial area in the experiment showed wide variability in different groups of animals.

Thus, the infectious-inflammatory process in laboratory animals of group I on the 2nd day of infection was characterized by pronounced swelling and infiltration of soft tissues in the submandibular region measuring 2.2×3.1 cm, spreading to the neck area, the presence of a formed soft tissue defect tissues at the site of inflammation and fistula with copious purulent discharge. A computer radiovisogram in this group of animals revealed extensive destruction of bone tissue with sequestration and death of tooth buds (Figure 1).

In the II group of animals, the local clinical course of the infectious-inflammatory reaction on the 2nd day after infection was accompanied by swelling and infiltration of soft tissues in the submandibular area measuring 1.5x2.5 cm. On the 4-5th day of the disease, the skin became thinner and formed fistula with copious purulent discharge. A computer radiovisigram showed an area of extensive purulent inflammation of soft tissues with signs of osteolysis of the jaw bone tissue (Figure 2).

In experimental animals of group III, on the 2nd day from the moment of infection, a moderate inflammatory reaction was observed: limited swelling and infiltration of soft tissues in the submandibular region measuring 1.1x1.5 cm. X-ray revealed a focus of a purulent cavity in the soft tissues without visible signs of bone tissue pathology jaws. On the 5-7th day of observation, the infectious-inflammatory process in the maxillofacial area tended to resolve (Figure 3).

Local signs of the clinical course of the infectious-inflammatory process in the maxillofacial area in animals of group IV on the 2nd day after infection were not pronounced and were manifested by slight infiltration of soft tissues and moderate loss of jaw bone tissue at the site of infection (Figure 4).

Immunological study results

Analysis of the data obtained based on diagnostic allergy tests showed that bacterial sensitization developed in all groups of experimental animals (Figure 5).

An assessment of the RSLI indicators, which shows the degree of toxic damage to immune cells, revealed that with an increase in the period of contact with bacterial LPS, its quantitative increase occurs (from 11.3 ± 2.4 to 14.2 ± 2.0). At the same time, it should be noted that the number of animals with positive RSLI values is increasing, which increases from 30% to 80% (Figure 6).

A similar picture was observed when analyzing the results of RSLI, showing the degree of cellular reaction to the antigen. So, if during a single exposure (IV group of animals) this indicator was 1.1 ± 0.19 , then in group I animals with quadruple infection it was 1.8 ± 0.17 . The percentage of animals with positive samples increased in accordance with the increase in exposure time (from 10% to 70%).

When assessing the results of RDTK tests showing the level of reagent-type antibodies, a twofold increase in reaction rates was established from 8.7 ± 0.7 to 16.4 ± 0.8 ($P < 0.05$). The percentage of detection of positive samples increased from 10% to 40%.

Analysis of RSBTL indicators made it possible to identify the degree of severity of the functional response of T-lymphocytes to a specific antigen, manifested by a 2.5-fold increase in quantitative values (6.6 ± 0.9 and 15.8 ± 0.9 , $R < 0.05$).

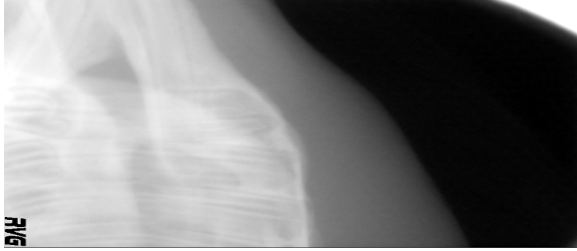


Figure 1. Computer radiovisiogram of the lower jaw of an animal with quadruple infection (lateral projection). Areas of destruction with sequestration of the jaw body and death of tooth rudiments are identified.



Figure 2. Computer radiovisiogram of the lower jaw of an animal with triple infection (sagittal projection). Areas of bone tissue destruction in the anterior jaw are identified.

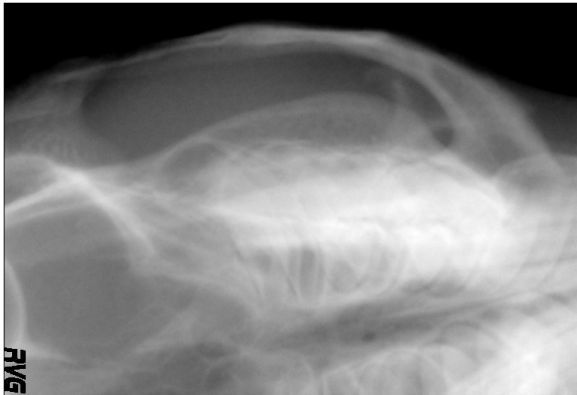


Figure 3. Computer radiovisiogram of the lower jaw of an animal with double infection (sagittal projection). A large purulent cavity is detected in the perimaxillary soft tissues

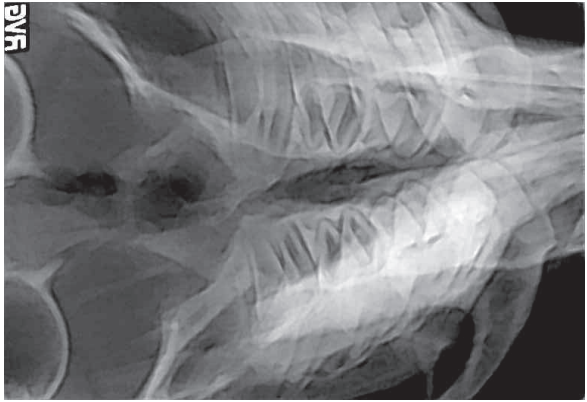


Figure 4. Computer radiovisogram of the lower jaw of an animal with a single infection (sagittal projection). There is a moderate loss of bone tissue in the area of infection

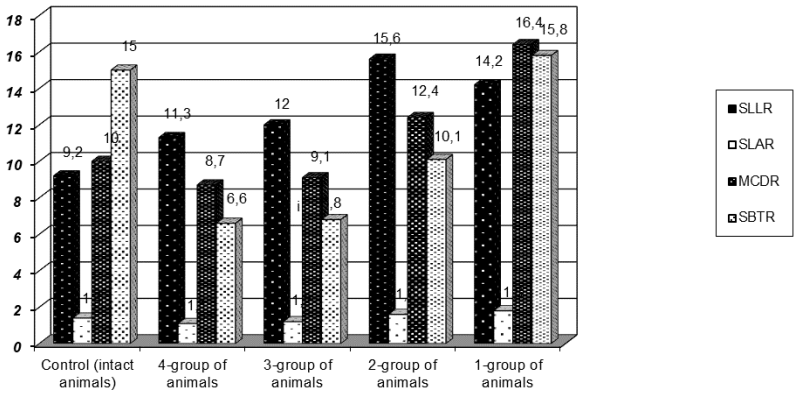


Figure 5. Level of bacterial sensitization in groups of experimental animals

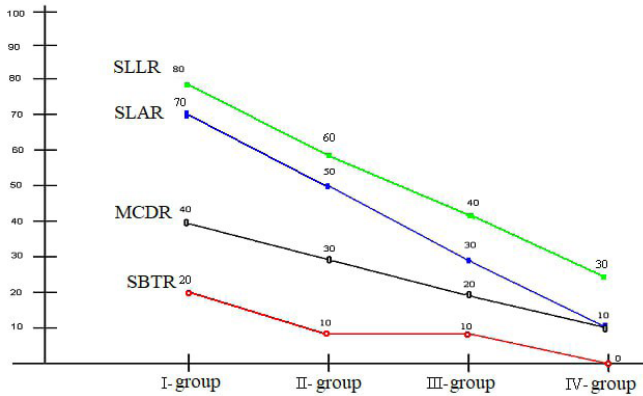


Figure 6. Results of allergy testing in experimental animals of different groups (in%)

At the same time, the percentage of positive samples increased from 0% (IV group) to 20% (I group), which indicates the formation of HRT.

A comprehensive analysis of the data obtained showed that sensitization to LPS in animals of the first group was detected in 100% of cases. It should be emphasized that in 20% of cases all 4 allergy tests used were positive. In 40% of cases, 3 tests were positive, and the remaining animals had 2 tests.

Analysis of the data obtained in group II animals showed the presence of sensitization to LPS in 100% of cases. At the same time, 10% of animals had all 4 tests positive, 30% had 3 tests, and the rest had 2 tests.

In animals of group III, the development of sensitization to LPS was also noted in 60% of cases. However, 4 positive reactions were detected in 10% of animals, 3 in 20%, 2 in 30%. In 40% of cases, only one of the allergy tests used was positive.

In group IV of animals, only 30% of animals were sensitized, in which no more than 2 allergy tests used were positive.

Discussion of research results

As a result of clinical and immunological studies of the nature of the course of the infectious-inflammatory process in the maxillofacial area in experimental animals, it was established that with increasing periods of contact with bacterial LPS, the level and severity of sensitization to it increases. This is manifested by a significant increase in quantitative values and the percentage of detection of positive samples.

Moreover, the increase in the level of bacterial sensitization of the body in the experiment, in turn, causes a shortening of the acute phase of the purulent-inflammatory process and its chronicity.

It should be noted that an increase in the number of positive allergy tests in the same animal has an unfavorable prognostic value in the development and course of the purulent-inflammatory process. This circumstance is due to both the immunotoxic effect of bacterial decay products (increased RSAL) and a violation of the cellular component of immunity (positive RSAL, RSBL), which indicates the formation of DTH in these animals. In addition, an increase in the level of reagin-type antibodies (positive RDTK) indicates that in some cases the formation of HNT occurs.

As is known, inflammation and hypersensitivity are coupled processes, and in the field of human pathology they are in a cause-and-effect relationship. Their connecting link is immunity. The relationship between inflammation and hypersensitivity, as well as the autoimmunization that accompanies them, determines the wave-like course of the chronic inflammatory process [534].

Thus, immuno-allergic studies with the determination of quantitative indicators in the experiment made it possible to show those immunological disorders that formed the basis for the development of immune deficiency.

Summarizing the above, it should be noted that sensitization to bacterial LPS causes the development of T-dependent immunodeficiency and contributes to the chronicity of the purulent-inflammatory process in the maxillofacial area.

Thus, the results of the experimental study allow us to conclude that:

- The method of modeling the infectious-inflammatory process in the maxillofacial area ensures high reproducibility of the purulent-inflammatory process of the jaw and perimaxillary soft tissues in experimental animals. By the nature of the course of inflammation, this model is more consistent with odontogenic inflammatory diseases, the pathogenesis of which is based on mechanisms of specific sensitization of the body.
- Repeated administration of staphylococcal infection to experimental animals induces a state of increased sensitivity of varying levels to subsequent infection. At the same time, the nature of the infectious-inflammatory reaction in guinea pigs depends on the duration of contact of the body with bacterial LPS: a more severe and prolonged course of inflammation is observed with long periods of contact of the body with bacterial LPS compared to those animals with a short period of contact and in non-sensitized animals.
- The shortening of the acute phase of the purulent-inflammatory process and its chronicity are determined by the level of bacterial sensitization of the body.

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作为微量营养素缺乏症患者饮食中功能性成分新来源的微绿产品的质量管理
**QUALITY MANAGEMENT OF MICROGREENS AS A NEW
SOURCE OF FUNCTIONAL INGREDIENTS IN THE DIETS OF
PEOPLE WITH MICRONUTRIENT DEFICIENCIES**

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抽象的。本文研究了微绿植物的理化特性，并介绍了光合色素、酚类化合物、一般抗氧化活性的定量含量结果，以及微绿植物中微绿植物生长和发育的指标。此外，还指出了封闭城市型协同增效系统中微型蔬菜生产的特点，并指出了使用微型蔬菜作为功能性成分来形成微量营养素缺乏症患者饮食的前景。

关键词：微型蔬菜、微量和常量营养素、功能成分、协同增效器、封闭系统、微量营养素缺乏。

Abstract. *The article examines the physicochemical properties of microgreens and presents results on the quantitative content of photosynthetic pigments, phenolic compounds, general antioxidant activity, as well as indicators of growth and development of microgreens in microgreens. In addition, the features of the production of microgreens in closed urban-type synergotron systems are noted and the prospects for using microgreens as a functional ingredient in the formation of a diet for people with micronutrient deficiencies are indicated.*

Keywords: *microgreens, micro- and macronutrients, functional ingredients, synergotron, closed systems, micronutrient deficiency.*

Currently, one of the key tasks to achieve independent production in Russia is the research and development of new functional food products. This follows from the Strategic National Priorities of the Russian Federation, approved in 2021. These include such a significant priority as scientific and technological develop-

ment. This priority is included in the strategy of scientific and technological development of the Russian Federation, which states that one of the most important big challenges is the need to ensure food security and food independence of the country, the development and development of new competitive food products in international markets and reducing technological risks in the agro-industrial complex .

These challenges are closely related to the Doctrine of Food Security of the Russian Federation, approved in 2020. The Doctrine raises questions about rational standards of food consumption, its economic and physical accessibility, compliance of products with modern international scientific principles of balanced optimal nutrition, as well as improving the quality of life of the country's population through sufficient food supply and the development of new food products that meet safety standards and have high nutrient status.

In addition, annual reports from the World Health Organization report serious micro- and macronutrient deficiencies in the diets of people around the world. A promising area in science is the study of new food products with a high content of micro- and macronutrients. Food products with a high nutrient status are important for reducing the lack of deficient nutrients in the diet and preventing the development of nutritional diseases and is a promising sector for the development of the Russian agro-industrial complex. These foods include microgreens.

In 2012, Xiao Z. et al. For the first time, the high nutrient status of microgreens was noted, which initiated a lot of research into microgreens, their production methods and uses. Microgreens differ from traditional crops in their delicate texture, more pronounced taste and aromatic characteristics and increased content of biologically active compounds compared to traditional analogues. Currently, the most popular microgreens are basil, arugula, radish, amaranth, peas, daikon, pak choi, broccoli and peas. In world practice, to optimize the production of agricultural crops in urban conditions, technologies for growing green crops in closed, isolated automated systems - phytotrons, in which conditions and cultivation modes can be adjusted over a wide range, are actively used. These technologies are applicable when growing microgreens, since the use of synergotrons for this purpose in cities significantly reduces delivery time from production to consumer, which has a positive effect on the quality of microgreens, which are characterized by rapid withering and a decrease in nutrient status after harvesting.

The study was carried out in an urban-type synergotron ISR-0.01, developed by the ANO "Institute of Development Strategies" (Russia, Moscow). Characteristics of the synergotron (ISR-0.01): external chamber height 1800 mm, length 1000 mm, width 500 mm. The chamber has 4 tiers of shelves, their internal dimensions are 920 mm * 350 mm. The design of the synergotron allows you to create different temperature and light conditions in it and use a hydroponic system for watering/feeding plants.

Synergotron has two ventilation systems and four tiers of shelves equipped with fluorescent (white light) and LED lamps (red and blue light). The nutritional value and content of biologically active substances of microgreens are greatly influenced by the type, botanical variety, modes and technology of microgreens production. Lighting modes in the experiments were adjusted by combining fluorescent lighting with lighting from red, green and blue LEDs, allowing to obtain an optimal ratio with the emission spectrum close to natural sunlight in the region of photosynthetically active radiation. Thus, optimal conditions for growing microgreens in an urban synergotron were identified, which are presented in Figure 1.

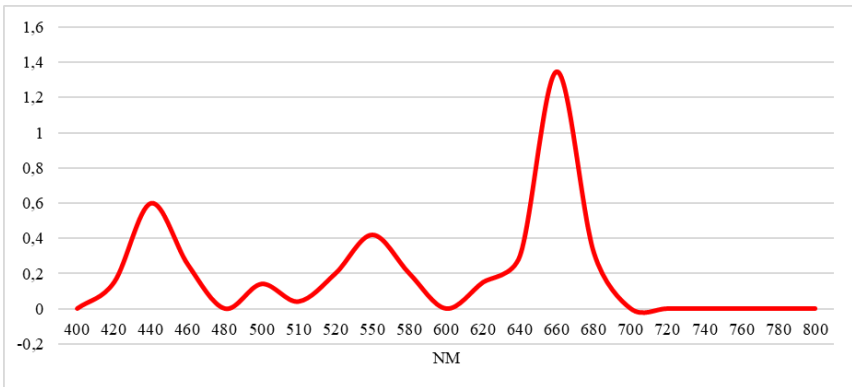


Figure 1. Intensity of the illumination spectra in the synergotron

The temperature during the experiment was 260-280 C during the daytime and 170-200 C at night. The duration of daylight hours in the ISR 0.01 synergotron was 16 hours. Microgreen seeds were germinated in trays measuring 35 cm x 16 cm. Jute mats measuring 10 cm x 15 cm and 5 mm thick served as a substrate. The sowing frequency was 840 seeds per mat (56,000 seeds/m²). Before sowing the seeds, the trays were treated with a disinfectant solution and washed with distilled water. Jute mats were thoroughly moistened in water and laid out in trays, three pieces each.

Biocorrectors were also installed to regulate the growth of microgreens and the accumulation of chemicals by plants. The study used inorganic biocorrectors based on silicon (1-Ethoxysilatran HOSi(OCH₂CH₂)₃N) and hydrothermal nanosilica 100 nm) and germanium (1-Germatronol HOGe(OCH₂CH₂)₃N) and organic biocorrectors “Nikfan” and “Azotovit”. During the study, it was revealed that the most optimal way to process microgreens is to soak the seeds for two hours before sowing. The concentration for inorganic preparations that contributes to a greater accumulation of chemicals in microgreens was 1.0 * 10⁻³%, and for organic prepa-

rations “Nikfan” and “Azotovit” the optimal concentration was 0.14% and 50%, respectively. The studied inorganic and organic preparations had a positive effect on samples of microgreen lettuce and Abyssinian niger seed in comparison with the control sample, which was treated with distilled water. The results of physicochemical analyzes of the processed microgreen samples are presented in tables 1 and 2.

Table 1.
Physico-chemical indicators of the content of microelements in salad microgreen

Salad «Azart»						
Biocorrector	Total chlorophyll (mg/g)	Chlorophyll a:b ratio	Carotenoids (mg/g)	Phenolic compounds (mg/g)	Anti-oxidants (mg/g)	Vitamin C (mg/100g)
Control	1,77	2,8	0,36	0,191	6,24	20,7
1-Ethoxysilatran	2,23	2,4	0,25	0,212	8,35	23,6
1-Germatronol	2,609	2,6	0,45	0,238	8,83	24,8
Hydrothermal nanosilica 100 nm	1,92	2,3	0,31	0,201	7,45	23,1
Nikfan	1,99	2,2	0,31	0,199	7,0	21,8
Azotovit	1,97	1,9	0,32	0,197	7,02	20,9

Table 2.
Physico-chemical indicators of the content of microelements in niger seed microgreens.

Niger seed plant						
Biocorrector	Total chlorophyll (mg/g)	Chlorophyll a:b ratio	Carotenoids (mg/g)	Phenolic compounds (mg/g)	Anti-oxidants (mg/g)	Vitamin C (mg/100g)
Control	6,71	1,4	0,53	0,21	8,43	24,1
1-Ethoxysilatran	8,35	2,32	0,63	0,32	9,26	26,8
1-Germatronol	7,47	3,14	0,78	0,29	13,29	27,9
Hydrothermal nanosilica 100 nm	6,89	2,1	0,59	0,25	8,78	26,4
Nikfan	6,83	2,23	0,54	0,24	8,65	25,0
Azotovit	6,82	2,19	0,52	0,24	8,0	25,4

Thus, samples treated with 1-ES and 1-EG exceeded the control sample in terms of leaf size in Abyssinian niger seed by 48.7% and 9.8%, respectively. Silicon preparations and germatronol have a positive effect on microgreen leaf growth, which indicates their importance when choosing preparations for crop

treatment. The dynamics of growth of microgreens treated with 1-EG differs significantly from the control sample - by 53.3%. Microgreens treated with 1-EG and 1-ES showed higher antioxidant concentrations compared to the control sample by 57.5% for 1-EG and 9.6% for 1-EG. Also, when compared with the control sample, microgreens treated with 1-EG and 1-ES exceeded the content of phenolic compounds by 38.1% and 52.4%, respectively. Thus, the most effective for the accumulation of chemical elements in microgreens are the inorganic preparations 1-ethoxysilatrane and 1-germatronol.

Nowadays, more and more people are interested in consuming foods with high nutrient status. According to scientists, due to their superiority in micro- and macronutrient content over their adult counterparts, microgreens can be considered a “super food” and become a functional ingredient in the production of various food products for mass consumption. To identify the most promising crops for use as a functional ingredient, 14 types of microgreens were studied. The following types of microgreens were used in the study: Azart Lettuce, Abyssinian Niger seed, Kale, Broccoli, Mustard, Arugula, Watercress, Daikon, Sango Radish, Pak Choi, Green Basil, Purple Basil, Red Amaranth, Green Amaranth. Data on the physical and chemical parameters of these types of microgreens are presented in Table 3.

Based on the data obtained, we can conclude that, in terms of nutrient composition, the most promising types of microgreens for use in the food industry are kale, sango radish, arugula, purple basil, green basil, Abyssinian niger seed and watercress. These crops have a delicate texture, pleasant smell and bright taste, and due to their organoleptic properties, these crops in the form of microgreens can be used in the development of food products, rations and diets. It is important to note that currently microgreens are used primarily as a decorative element in restaurant dishes, however, due to the ease of their cultivation, as well as organoleptic properties and high content of micro- and macronutrients, this product has every prospect for use as a functional ingredient or as a replacement for mature green crops when preparing salads and dressings.

In addition, scientists are currently studying the issues of enriching microgreens with essential micronutrients, which will improve the nutrient status of microgreens and make them a promising product for the prevention of nutritional diseases.

Table 3. *Physico-chemical indicators of the content of microelements in various types of microgreens*

Sample	Chloro- phyll a (mg/g)	Chloro- phyll b (mg/g)	Total chloro- phyll (mg/g)	Chloro- phyll a:b ratio	Carot- enoids (mg/g)	Phenolic com- pounds (mg/g)	Anti- oxidants (mg/g)	Weight 10 pcs	Height mm	Nitrogen tester
Salad	1,976	0,607	2,610	3,253	0,524	17,407	0,238	0,2197	35	219
Niger seed	5,348	1,883	7,303	2,841	1,370	18,163	0,221	0,5387	64	405
Kale	8,739	2,997	11,854	2,915	2,284	29,406	0,308	0,325	38	719
Broccoli	4,585	1,529	6,176	2,999	1,094	24,647	0,292	0,359	62	590
Mustard	3,434	1,165	4,645	2,948	0,867	22,203	0,281	0,5435	65	512
Arugula	4,823	1,572	6,461	3,068	1,144	28,342	0,282	0,1744	39	566
Watercress	4,476	1,525	6,061	2,935	1,031	23,049	0,293	0,2392	54	448
Daikon	5,762	1,663	7,504	3,464	1,536	23,389	0,268	2,0718	98	786
Radish Sango	8,975	3,064	12,159	2,929	1,950	24,456	0,239	2,1182	78	311
Pak-choi	3,490	1,100	4,637	3,172	0,793	26,912	0,222	0,2545	47	415
Basil green	5,623	1,605	7,305	3,503	1,441	26,232	0,293	0,1665	24	475
Basil red	5,939	1,927	7,947	3,082	1,567	27,100	0,303	0,2769	23	448
Amaranth red	3,749	1,070	4,870	3,503	0,956	25,973	0,293	0,056	44	219
Amaranth green	2,471	1,499	4,001	1,648	0,354	22,342	0,206	0,053	45	227

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智能AR消防头盔的云计算和5G传输
**CLOUD COMPUTING AND 5G TRANSMISSION OF INTELLIGENT
AR FIREFIGHTING HELMETS**

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抽象的。云计算通过互联网向用户按需提供计算资源(如服务器、存储、软件等)。可以为智能AR消防头盔提供强大的后台支持,如人工智能、大数据、物联网等领域的研发、计算以及数据的存储和管理。5G传输可以为智能头盔提供高速数据传输,如4K第一人称视角拍摄、音视频通话、云计算结果反馈等。云计算和5G传输相辅相成,可以优化升级智能头盔。

关键词: 智能头盔、AR、云计算、5G、消防。

Abstract. *Cloud computing provides computing resources (such as servers, storage, software, etc.) to users on demand via the internet. It can provide powerful backend support for intelligent AR firefighting helmets, such as research and development and calculations in the fields of artificial intelligence, big data, Internet of Things, etc., as well as storage and management of data. 5G transmission can provide high-speed data transmission for smart helmets, such as 4K first-person view shooting, audio and video calls, feedback of cloud computing results, etc. Cloud computing and 5G transmission complement each other and can optimize and upgrade smart helmets.*

Keywords: *Intelligent Helmet, AR, Cloud Computing, 5G, Firefighting.*

To achieve features such as voice and gesture control, AR high-definition auxiliary display, life detection, gas sensors, etc., in intelligent firefighting helmets, data storage, management, and processing are indispensable. If these data are processed on the helmet, it would require a large amount of power consumption. Therefore, we choose cloud computing. 5G can provide high-speed data transmission for intelligent firefighting helmets, high-definition shooting, audio and video calls, and feedback of cloud computing results. In this way, intelligent firefighting helmets can achieve better communication and collaboration, meeting the needs of remote guidance, equipment inspection, and maintenance.

Construction of the Cloud Platform

Before constructing the cloud platform, we need to consider choosing the appropriate cloud computing platform, whether to choose a private cloud or a hybrid cloud. The advantage of a private cloud is that it can provide higher security, privacy, and flexibility, and the cloud environment can be customized to meet specific business needs. The disadvantage is that it requires higher costs and maintenance, as well as lower scalability and reliability. A hybrid cloud is a cloud computing model that combines private clouds and public clouds, and can move data and applications between the two environments. Hybrid clouds can balance the security of private clouds and the flexibility of public clouds. You can choose the most suitable cloud deployment method according to business needs and compliance requirements, and you can use the resources of the public cloud to cope with peak computing needs. However, it requires higher technical and management capabilities, as well as more complex cloud integration and orchestration. When carrying out firefighting and rescue tasks, the security and privacy of data, as well as the stability and reliability of the network, need to be considered. Therefore, building a private cloud is a more suitable choice because it can provide higher control and confidentiality, as well as lower latency and failure rates.

We choose IBM Cloud Paks to build the cloud platform. IBM Cloud Paks is a series of container-based software solutions that run on the Red Hat OpenShift platform, providing security, flexibility, and portability across any cloud. We need to choose the type of IBM Cloud Paks that suits our business needs and goals, as well as the cloud environment we want to deploy. IBM Cloud Paks offers six different types, namely IBM Cloud Pak for Data, IBM Cloud Pak for Applications, IBM Cloud Pak for Integration, IBM Cloud Pak for Automation, IBM Cloud Pak for Multicloud Management, and IBM Cloud Pak for Security. Depending on the functionality and performance requirements of our application, we choose one or more types of IBM Cloud Paks and the private cloud environment we want to deploy.

During the process of preparing the cloud environment, we need to ensure that it supports the installation and operation of IBM Cloud Paks. We need to meet the system requirements of IBM Cloud Paks, including hardware, software, network, storage, etc. We also need to install and configure the Red Hat OpenShift platform to provide containerized infrastructure and services. IBM Cloud Paks also provides the IBM Cloud Pak Playbook tool to automate and simplify the installation and configuration process. We can also use the IBM Cloud Pak console to manage and monitor IBM Cloud Paks instances and resources.

Finally, it involves the development and deployment of cloud-native applications, as well as the use of the features and services provided by IBM Cloud Paks to achieve our goals. IBM Cloud Paks provides development tools and frame-

works, such as Kabanero, Appsoody, and Codewind from IBM Cloud Pak for Applications, and deployment tools and methods, such as Tekton, Razee, and Open Liberty Operator from IBM Cloud Pak for Applications.

The data we monitor and calculate on the cloud platform includes:

- Firefighter's location information, including GPS/Beidou coordinates, inertial navigation data, etc., used for real-time positioning and trajectory backtracking.

- Fire scene environment information, including temperature, humidity, toxic gas concentration, etc., used to assess the danger level of the fire and the safety status of the rescuers.

- Fire scene image information, including high-definition video and infrared thermal imaging, used for smoke penetration, fire source positioning, life body search, etc.

- Firefighter's vital sign information, including heart rate, blood pressure, blood oxygen, etc., used to monitor the physical condition and health risks of rescuers.

- Firefighter's voice call information, including voice intercom, SOS alarm, etc., used to achieve real-time communication and coordination between the command center and rescuers.

To achieve the collection, transmission, processing, and display of these data, the following applications need to be designed on the cloud platform:

- Data collection program, used to obtain data from various sensors and cameras in the intelligent firefighting helmet, and convert it into a standard data format.

- Data transmission program, used to send data to the data center of the cloud platform through 4G/5G network or wireless communication module, and perform data compression and encryption.

- Data processing program, used to parse, analyze, mine, and predict data, as well as generate alarm information and report information.

- Data display program, used to present data in the form of graphics, charts, maps, etc. on the Web or mobile App, and provide data query, download, and sharing functions.

Selection of 5G Transmission Scheme

We need to choose communication equipment and operators that support 5G NSA and SA modes according to the requirements of our firefighting rescue scenarios and environments. And design suitable interfaces and protocols for cloud computing and 5G transmission, design the process of data format, encoding, compression, encryption, transmission, processing, storage, etc., according to functional and performance requirements. Refer to existing standards and specifications to ensure compatibility and scalability.

There are already some communication devices on the market that support 5G NSA and SA modes, such as Huawei's 5G CPE Pro 2, ZTE's 5G Indoor Router

MC801A, Nokia's FastMile 5G Gateway, etc. These devices can automatically switch under 5G NSA and SA modes, support multiple bands and systems, provide a peak rate of up to 3.6Gbps, and are suitable for use as mobile or fixed data terminals in firefighting rescue scenarios.

The Huawei 5G CPE Pro 2 is a wireless router that supports 5G NSA and SA modes. It can convert 5G signals into Wi-Fi signals, providing high-speed network connections for smart firefighting helmets. The 5G CPE Pro 2 can be deployed on fire trucks or at suitable locations near the fire scene to achieve mobile or fixed data terminals; The 5G Indoor Router MC801A2 is an indoor router that supports 5G NSA and SA modes. It can convert 5G signals into Wi-Fi signals, providing high-speed network connections for smart firefighting helmets. The 5G Indoor Router MC801A can be deployed in the fire command center or other places that require indoor coverage to achieve stable data terminals; The Huawei 5G AR Industrial Head-mounted Computer (Smart Helmet) M13 is a smart helmet that integrates 5G communication modules, AR glasses, thermal imaging cameras, life detectors, gas sensors, etc[7]. It can scan and navigate in real-time in a smoke-filled environment, display information such as the temperature of the fire scene, poisonous gas, vital signs, and conduct audio and video calls with the backend command center, improving rescue efficiency and safety. The 5G AR Industrial Head-mounted Computer (Smart Helmet) M1 can be used as the core equipment of your smart firefighting helmet system to achieve a scenario-based Internet of Things solution for 5G and AI interconnection.

We consider the following transmission interfaces and protocols:

- JSON format to represent data, which is a lightweight data exchange format that can be conveniently parsed and processed between different platforms and languages.

- Protobuf encoding to compress data, which is an efficient binary data serialization protocol that can save network bandwidth and storage space.

- AES encryption to protect data, which is a widely used symmetric encryption algorithm that can provide high-strength security and reliability.

- TCP/IP protocol to transmit data, which is a reliable connection-oriented network protocol that can ensure the integrity and order of data.

- MQTT protocol for communication, which is a lightweight message delivery protocol based on the publish/subscribe model, which can support a large number of device connections and low-power application scenarios.

Conclusion:

The Intelligent AR Firefighting Helmet is an intelligent device that uses cloud computing and 5G transmission technologies to provide real-time data support and guidance for firefighting rescue. It can collect, transmit, process, and display various important information in complex fire scenes, such as the temperature of

the fire scene, poisonous gas, vital signs, etc., and conduct audio and video calls with the backend command center, improving rescue efficiency and safety. To design an Intelligent AR Firefighting Helmet, not only do we need to consider the material, structure, function, performance, design, and aesthetics of the helmet, but also the platform, scheme, interface, protocol, testing, and monitoring of cloud computing, as well as the equipment, operators, interface, protocol, testing, and monitoring of 5G transmission. This is an innovative and practical idea that contributes to the cause of firefighting rescue.

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