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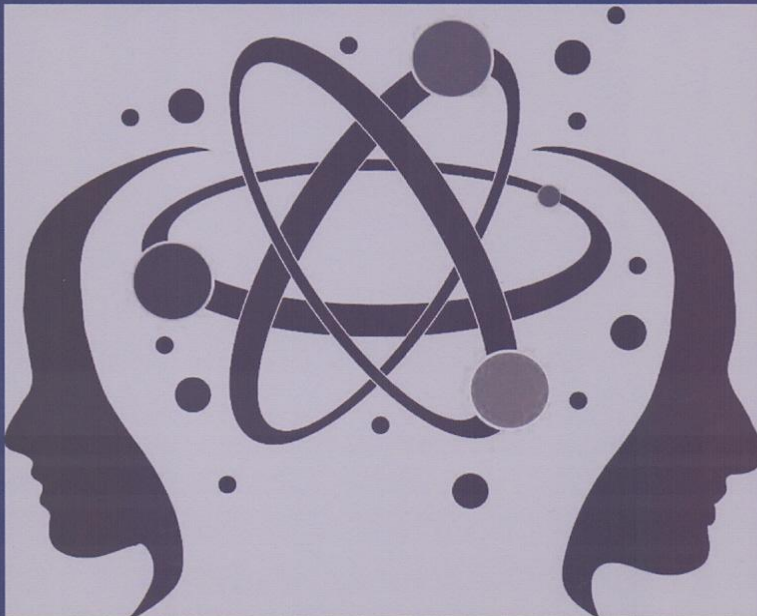


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KATCHAR  
SCIENTIFIC PERIODICAL

1



2021



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НАЦИОНАЛЬНАЯ АКАДЕМИЯ НАУК РЕСПУБЛИКИ АРМЕНИЯ  
NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF  
ARMENIA

ԳԻՏԱԿՐԹԱԿԱՆ ՄԻՋԱԶԳԱՅԻՆ ԿԵՆՏՐՈՆ  
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INTERNATIONAL SCIENTIFIC-EDUCATIONAL CENTER



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ԵՐԵՎԱՆ-2021

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## ENSURING GAS SAFETY VIA MICROPROCESSOR BASED GAS DETECTING DEVICE

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### **Abstract**

This article is devoted to the design and production of micro-processor based gas analyzing and detecting device of the new generation. Two methods were chosen for the gas detection process, one of which is the catalytic combustion method based on heat generated by combustible gas burning on an oxidation catalyst, and the second one is electrochemical principle-based measurements which use an electrochemical sensor to detect gas concentration by measuring current based on the electrochemical principle, which utilizes the electrochemical oxidation process of target gas on the working electrode inside the electrolytic cell, the current produced in the electrochemical reaction of the target gas is in direct proportion with its concentration while following Faraday law, then concentration of the gas could be get by measuring value of current.

The combination of these sensors provides low consumption, high precision, high sensitivity, wide linear range, good anti-interference ability, excellent repeatability and stability of the detector results.

Adding a microprocessor to the sensors which work by the above-mentioned methods, we assembled gas detecting and analyzing device "ELAR", which is a microprocessor-based and software-controlled device (hereinafter referred to as the "signalling device"), used in rooms to detect leaks of natural gas (CH<sub>4</sub>) and increased concentration of incompletely burnt carbon monoxide (Co). When triggered, the alarm emits a loud sound and light signal and also sends a command to close the solenoid valve, cut off the supply of combustible gas, to prevent an explosion from gas leakage, fire or human casualties.

As a result, it is expected to have gas analyzing and detecting device of a new generation which won't react to other gases apart from CH<sub>4</sub> and Co, will have a self-calibration function with special software, 0 adjustments, auto-calibration when in use, alarming when detectors are out of order, as well as will register data by time and incidents in non-volatile memory. They will have the ability to read incidents using a computer program.

### **Keywords and phrases**

Catalytic combustion method, compensation element, lower-explosion-limit (LEL), electrochemical oxidation process, electrolytic cell, electrochemical reaction.

**ԳԱԶԻ ԱՆՎՏԱՆԳՈՒԹՅԱՆ ԱՊԱՀՈՎՈՒՄ ՄԻԿՐՈՊՐՈՑԵՍՈՐԱՅԻՆ ՀԻՄՔՈՎ  
ԳԱԶԵՐԻ ՀԱՅՏՆԱԲԵՐՈՂ ՍԱՐՔԻ ՄԻՋՈՑՈՎ**

**ԱՇՈՏ ԽԱՉԱՏՐՅԱՆ**

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**Համառոտագիր**

Սույն հոդվածը նվիրված է նոր սերնդի միկրոպրոցեսորային հիմքով գազի վերլուծության և հայտնաբերման սարքի նախագծմանը և արտադրությանը: Գազի հայտնաբերման գործընթացի համար ընտրվել է երկու մեթոդ, որոնցից մեկը կատալիտիկ այրման եղանակն է, որը հիմնված է օքսիդացման կատալիզատորի վրա այրվող գազի այրման արդյունքում առաջացած ջերմության վրա, երկրորդը էլեկտրաքիմիական սկզբունքի վրա հիմնված չափումներն են, որտեղ կիրառվում է էլեկտրաքիմիական զգայուն տարր, որը թիրախային գազի էլեկտրաքիմիական օքսիդացման պրոցեսն օգտագործում է էլեկտրոլիտիկ բջջի ներսում գործող էլեկտրոդի վրա, և թիրախային գազի էլեկտրաքիմիական ռեակցիայի մեջ արտադրվում է հոսանք, որը, Ֆարադեյի օրենքի համաձայն, ուղիղ համեմատական է իր կոնցենտրացիային, ուստի գազի կոնցենտրացիան կարող է ստացվել հոսանքի արժեքը չափելու միջոցով:

Այս զգայուն տարրերի համադրությունը ապահովում է ցածր սպառում, բարձր ճշգրտություն, բարձր զգայունություն, լայն գծային տիրույթ, ինչպես նաև դետեկտորի արդյունքների գերազանց կրկնություն և կայունություն:

Վերոհիշյալ մեթոդներով աշխատող զգայուն տարրերին ավելացնելով միկրոպրոցեսոր՝ մենք հավաքեցինք սենյակներում օգտագործվող «ELAR» գազ հայտնաբերող և վերլուծող սարքը, որը միկրոպրոցեսորի վրա հիմնված և ծրագրակազմով կառավարվող սարք է (այսուհետ՝ ազդանշանային սարք) նախատեսված բնական գազի արտահոսք (CH<sub>4</sub>) և թերի այրված ածխածնի օքսիդի (Co) ավելացված կոնցենտրացիա հայտնաբերելու և վերլուծելու համար: Գործարկվելիս սարքը արձակում է ուժեղ ձայնային և լուսային ազդանշան, ինչպես նաև հրաման է ուղարկում փակել էլեկտրական փականը, դադարեցնել բնական գազի

մատակարարումը, որպեսզի կանխվեն գազի պայթյունը, արտահոսքը և մարդկային զոհերը:

Արդյունքում ակնկալվում է ունենալ նոր սերնդի գազի վերլուծող և հայտնաբերող սարք, որը չի ազդի այլ գազերի վրա, բացի CH<sub>4</sub>-ից և Co-ից, կունենա ինքնակարգաբերման գործառույթ՝ հատուկ ծրագրակազմով, 0-ի կարգաբերում, ավտոմատ տրամաչափարկում շահագործման ժամանակ, ձայնային ազդանշանում զգայուն տարրերի շարքից դուրս գալու դեպքում, ինչպես նաև կգրանցի տվյալները ըստ ժամանակի և միջադեպերի էներգամանկախ հիշողության մեջ և կունենա համակարգչային ծրագրի միջոցով միջադեպեր կարդալու հնարավորություն:

### **Բանալի բառեր և բառակապակցություններ**

Կատալիտիկ այրման մեթոդ, փոխհատուցման տարր, պայթյունի ստորին սահման (LEL), էլեկտրաքիմական օքսիդացման պրոցես, էլեկտրոլիտային բջիջ, էլեկտրաքիմիական ռեակցիա:

## **ОБЕСПЕЧЕНИЕ ГАЗОВОЙ БЕЗОПАСНОСТИ С ПОМОЩЬЮ МИКРОПРОЦЕССОРНОГО ГАЗ АНАЛИЗАТОРА**

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### **Аннотация**

Статья посвящена разработке и производству газоанализатора нового поколения на базе микропроцессора. Для процесса обнаружения газа были выбраны два метода, один из которых - метод каталитического сжигания, основанный на тепле, выделяемом при сжигании горючего газа на катализаторе окисления, а второй - измерения на основе электрохимического принципа, основанные на электрохимическом принципе, который использует процесс электрохимического окисления целевого газа на рабочем электроде внутри электролитической ячейки, и ток, возникающий при электрохимической реакции целевого газа, который прямо пропорционален его концентрации, следуя закону Фарадея, а концентрацию газа можно получить путем измерения силы тока.

Комбинация этих датчиков обеспечивает низкое потребление, высокую точность, высокую чувствительность, широкий линейный диапазон, хорошую защиту от помех, отличную повторяемость и стабильность результатов детектора.

Добавив микропроцессор к датчикам, которые работают по вышеупомянутым методам, мы собрали устройство для обнаружения и анализа газа «ЭЛАР», которое представляет собой микропроцессорное устройство с программным управлением (далее именуемое «сигнальное устройство»), используемое в помещениях для обнаружения утечек природного газа ( $\text{CH}_4$ ) и повышенной концентрации не полностью сгоревшего окиси углерода ( $\text{CO}$ ). При срабатывании сигнализации детектор издает громкий звуковой и световой сигнал, а также посылает команду на закрытие электромагнитного клапана, прекращается подача горючего газа, чтобы предотвратить взрыв от утечки газа, пожара или человеческих жертв.

В результате ожидаем получить ализатор и детектор газа нового поколения, который не будет реагировать на другие газы, кроме  $\text{CH}_4$  и  $\text{CO}$ , и будет иметь функцию самокалибровки со специальным программным обеспечением, регулировку 0, автокалибровку при использовании, сигнализацию, когда детекторы вышли из строя, а также будет регистрировать данные по времени и инцидентам в энергонезависимую память и будет иметь возможность считывать инциденты с помощью компьютерной программы.

#### **Ключевые слова и фразы**

Метод каталитического сжигания, компенсационный элемент, нижний предел взрываемости (LEL), процесс электрохимического окисления, электролитическая ячейка, электрохимическая реакция.



## Introduction

Many accidents connected with natural gas leakage and explosions have taken place in our country in recent years. Many households prefer to unplug the gas detector device in use, as it reacts to different sources and switches off the valve from the gas meter. Apart from it, there is no possibility to calibrate and adjust the thresholds of gas detecting device, which causes difficulties in gas safety control and lowers the quality of gas distribution end-result. For good control and monitoring of gas safety in households, it became necessary to produce gas detectors and analyzers with above-mentioned functions and online transfer and registration of accidents (gas leakage), which will allow reacting pre-actively to the accidents.

### Theoretical and methodological bases

We have used two different methods in one device to achieve the target function. One of the methods is the catalytic combustion method based on heat generated by combustible gas burning on an oxidation catalyst. Sensors that work based on the method mentioned above consists of a detector element and a compensation element. The detector element consists of a coil of a precious metal wire and an oxidant catalyst active against combustible gas, sintered on the coil and alumina support. The element burns in reaction to any detectable gas. The compensation element consists of a coil of a precious metal wire and a glass inactive against combustible gas, sintered on the coil and alumina support. This element corrects the effect of the atmosphere (fig. 1a). The precious-metal wire coil heats the detector element from 300°C to 450 °C, then a combustible gas burns on the surface of the detector element, increasing the element's temperature. With changes in temperature, the precious-metal wire coil, a component of the element, changes resistance. The resistance changes almost in proportion to the concentration of the gas. The bridge circuit shown in the figure (fig. 1b) below allows the sensor to recognize the change in resistance as the voltage determines the gas concentration.

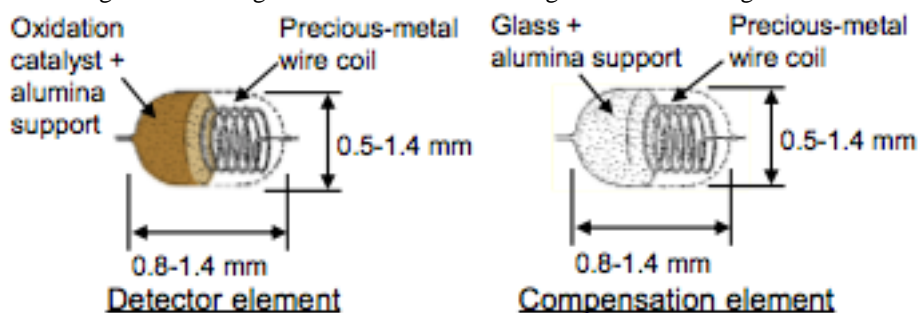


fig. 1a. Sensor elements

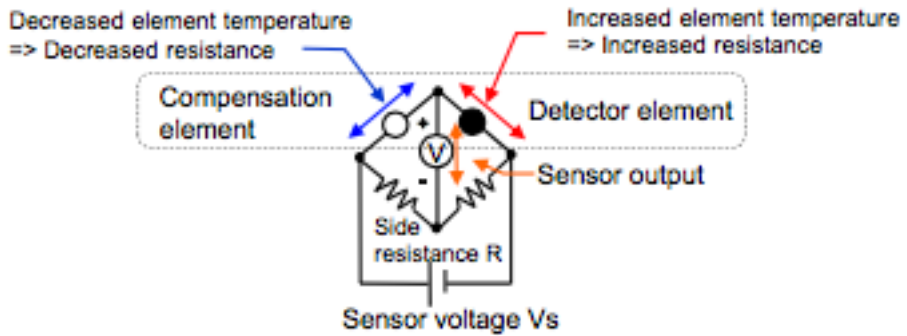


fig. 1b. Bridge circuit

These sensors have the following features

- Output characteristics

The precious-metal wire coil, the heat source, linearly changes in temperature resistance coefficient. In the lower-explosion-limit (LEL) concentration region, the burning reaction is proportional to the gas concentration. In this region, the output from the sensor slowly changes according to the change in gas concentration (fig. 2a).

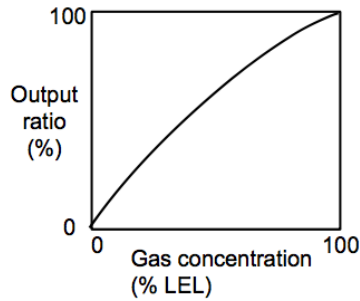


fig. 2a

- Responsiveness

The combustion heat produced on the surface of the detector element transfers to the precious-metal wire coil, changes the resistance of the bridge circuit, and then transforms into signals. With a high reaction rate, this sensor excels in responsiveness, accuracy, and reproducibility (fig. 2b).

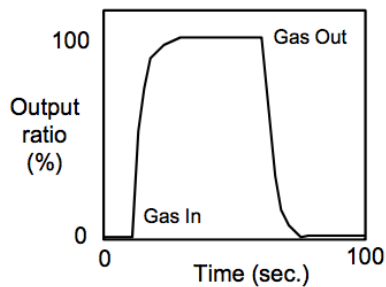


fig. 2b

- Temperature and humidity characteristics

The materials in the elements have high electrical resistance. They are less likely to be affected by the temperature and humidity in the use of the environment, allowing the reading to stay almost constant (fig. 2c).

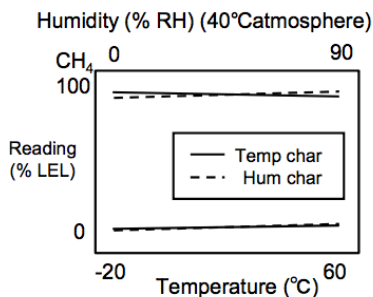


fig. 2c

- Catalyst development

The detector element uses a catalyst that promotes burning reaction. Having been developed in-house for gas sensors, this catalyst uses our proprietary know-how, providing long-term stability.

The second method is electrochemical principle-based measurements. We decided to use the electrochemical sensor to detect gas concentration by measuring current based on the electrochemical principle, which utilizes the electrochemical oxidation process of target gas on the working electrode inside the electrolytic cell, the current produced in the electrochemical reaction of the target gas is in direct proportion with its concentration while following Faraday law, then concentration of the gas could be get by measuring value of current. This method has the following features: low consumption, high precision, high sensitivity, wide linear range, good anti-interference ability, excellent repeatability and stability, which can be widely used in industrial and civilian areas to Detect Co concentration. For our gas detecting and analyzing devices, we have chosen ME2-CO electrochemical sensors, which have the following technical features.

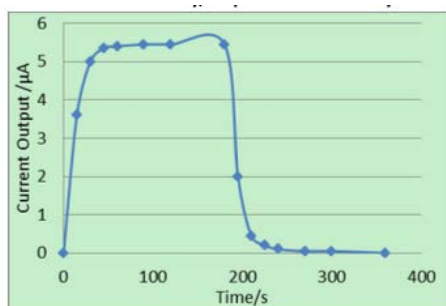


fig. 3a. Features of Sensitivity, response and recovery time

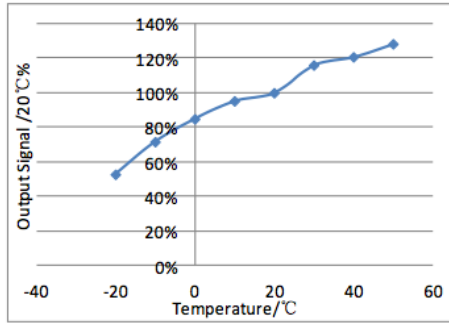


fig. 3b. Output under different temp.

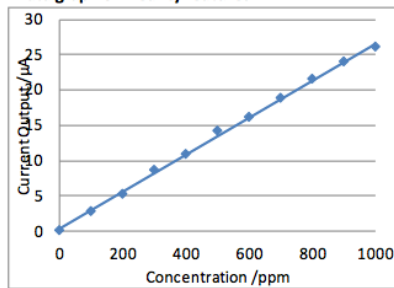


fig. 3c. Data graph of linearity features

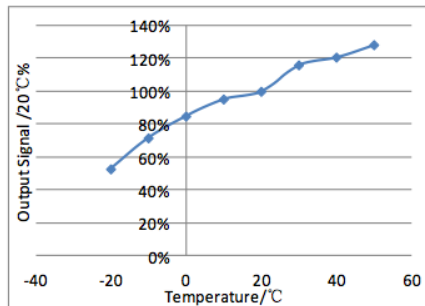


fig. 3d. Zero output under different temp.

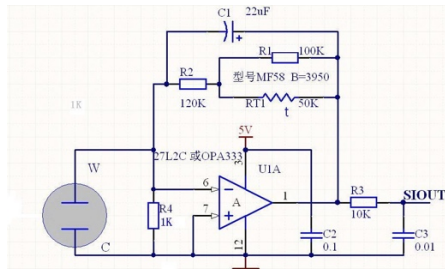


fig. 3e. Basic circuit

## Main results

Based on the methods mentioned above, we assembled gas detecting and analyzing device "ELAR", which is a microprocessor-based device (hereinafter referred to as the "signalling device") used in rooms to detect leaks of natural gas (CH<sub>4</sub>) and increased concentration of incompletely burnt carbon monoxide. When triggered, the alarm emits a loud sound and light signal. It also sends a command to close the solenoid valve, cut off the supply of combustible gas, and prevent an explosion from gas leakage, fire or human casualties.

The main features of the product:

- world-class advanced semiconductor gas sensors, with high sensitivity and stable performance, long service life and high noise immunity,
- anti-pollution design,
- calculates and corrects threshold deviations,
- registration of data by time, as well as incidents in non-volatile memory (in the format: year-month or hour-minute and type of incident (more than 100 records)) and the ability to read incidents using the Alarm computer program.

The advantages of the "ELAR" gas detector are the following:

- do not react to other gases apart from CH<sub>4</sub> and Co,
- self-calibration function with special software,
- 0 adjustment,
- auto-calibration when in use,
- alarming when detectors are out of order.

The characteristics of the "ELAR" gas detector are the following:

Name	ELAR
Natural gas CH <sub>4</sub> (response threshold)	0.2% - 8% ± 5%
CH <sub>4</sub> semiconductor catalytic combustion detector	0.1 % - 10 %
Carbon monoxide CO (response threshold)	15-500 ppm
CO electrochemical detector ME <sub>2</sub> -CO	0-1000 ppm
Temperature (response threshold)	70 <sup>0</sup> C ± 2.5 <sup>0</sup> C
Temperature (response threshold)	-10 <sup>0</sup> C + 100 <sup>0</sup> C
Lifetime	8-10 years
Saving data	more than 100 records
Data retrieval capability	yes
Warranty period	12 months
Indication and corresponding sound signal in case of failure of the sensor or parts of the power supply	yes
Signalling	yes
Closing the valve	yes
Calibration interval	Five years

## Conclusion

“Elar” gas analyzers were tested in the Gazprom system and showed the following features:

- they do not react to other sources of air density (resulting from boiling or frying),
- the explosion can be prevented by detecting gas leakage as it is transferred online immediately to the corresponding structure,
- domestic producer produces it so it is easy and will take less time to repair, as well as
- it has a good economic impact.

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ուղարկվել է գրախոսության 31.03.2021 թ., ընդունվել է տպագրության 06.04.2021 թ.:

**NUTRITION, PROBIOTICS AND PERIODIC DISEASE: DNA METHYLATION OF  
COMMENSAL *Escherichia coli***

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**Abstract**

Keeping specific diets is one of the main points in managing many diseases. It is also known that the intake of certain food might provide predictable shifts in gut bacterial communities in diseases. On the other hand, probiotics are suggested to restore the unfavourable changes in gut microbiota. Moreover, food enriched with specific probiotics might be the basis of certain diets, but the selection of probiotics and its targeted delivery through food requires serious scientific-technological approaches to stimulate/keep the growth of probiotic through synbiotic nutrition.

Periodic disease /PD, FMF, familial Mediterranean fever/, the autosomal recessive and systemic autoinflammatory disorder, is characterized by recurrent bouts of fever, serositis, synovitis, and/or cutaneous inflammation. A low-salt/low-fat diet may be used in the management of PD patients. The exact role of intestinal bacteria is not yet fully understood, but the potential for host-microbiota dialogue is widely discussed in the pathogenesis of PD.

This study aimed to clarify whether the investigations on DNA methylation of gut commensal *E. coli* from FMF patients had actuality for evaluating host-microbiota dialogue.

The following keywords- *E. coli*, gut, FMF and DNA methylation were used to collect data from PubMed (1990-2021).

The analysis of the literature data substantiated the usefulness of the investigations on DNA methylation of gut commensal *E. coli* in FMF disease for the evaluation of host-microbiota dialogue.

### **Keywords and phrases**

FMF, probiotic, *E. coli*, methylation, DNA, gut microbiota.

## **ՍՆՈՒՑՈՒՄ, ՊՐՈՔԻՈՏԻԿՆԵՐ ԵՎ ՊԱՐԲԵՐԱԿԱՆ ՀԻՎԱՆԴՈՒԹՅՈՒՆ՝ ԿՈՄԵՆՍԱԼ *Escherichia coli* –ՆԵՐԻ ԴՆԹ-ՄԵԹԻԼԱՑՈՒՄԸ**

### **ՎԱՐԴԱՆ ԾԱՏՈՒՐՅԱՆ**

ռազմաբժշկական ֆակուլտետի ղեկավար, Երևանի պետական բժշկական  
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Հատուկ դիետաների պահպանումը/հաստատումը շատ հիվանդությունների  
կառավարման հիմնական կետերից մեկն է: Հայտնի է նաև, որ որոշակի սննդա-



մթերքի ընդունումը կարող է հիվանդությունների ժամանակ աղիքային բակտերիալ համայնքներում առաջացնել կանխատեսելի տեղաշարժեր: Մյուս կողմից՝ պրոբիոտիկներն առաջարկվում են աղիների միկրոբիոտայի անբարենպաստ փոփոխությունները վերականգնելու համար: Ավելին՝ հատուկ պրոբիոտիկներով հարստացված սնունդը կարող է կարևոր հիմք հանդիսանալ որոշ դիետաների համար: Պրոբիոտիկի ընտրությունը, ինչպես նաև սննդի միջոցով պրոբիոտիկի նպատակային առաքումը, սակայն, պահանջում են լուրջ գիտատեխնիկական մոտեցումներ, որպեսզի սինբիոտիկ սնուցման միջոցով հնարավոր լինի պահպանել/խթանել նաև պրոբիոտիկ-բակտերիայի աճը:

Պարբերական հիվանդությունը (ՊՀ, PD, ընտանեկան միջերկրածովային տենդ), աուտոսոմալ ռեցեսիվ համակարգային ինքնաբորբոքային խանգարում է և բնութագրվում է ջերմության, սերոզիտի, սինովիտի և/կամ մաշկային բորբոքումների պարբերական նոպաներով: ՊՀ հիվանդության կառավարման համար հաջողությամբ կարող է ցածր աղային/յուղայնությամբ դիետա օգտագործվել: Աղիքային մանրէների ճշգրիտ դերը դեռ լիովին պարզ չէ, բայց ՊՀ պաթոգենեզում լայնորեն քննարկվում է տեր-միկրոբիոտա երկխոսության կարևորությունը: Այս ուսումնասիրությունը նպատակ ունի պարզելու ՊՀ հիվանդների աղիքային կոմենսալ *E. coli*-ների ԴՆԹ-ի մեթիլացման ուսումնասիրությունների արդիականությունը տեր-միկրոբիոտա երկխոսության գնահատման համար: PubMed-ից տվյալներ հավաքելու համար (1990-2021) օգտագործվել են հետևյալ հիմնաբառերը՝ *E. coli*, աղիք, FMF և ԴՆԹ մեթիլացում:

Գրական տվյալների հիման վրա կատարված այս հետազոտությամբ հիմնավորվեց ՊՀ-ի ժամանակ տեր-միկրոբիոտա երկխոսության գնահատման համար աղիքային կոմենսալ *E. coli* բակտերիաների ԴՆԹ-ի մեթիլացման հետազոտությունների կարևորությունը:

### **Բանալի բառեր և բառակապակցություններ**

FMF, պրոբիոտիկ, *E. Coli*, մեթիլացում, ԴՆԹ, աղիքային միկրոբիոտա:

## **ПРОБИОТИКИ И ПЕРИОДИЧЕСКАЯ БОЛЕЗНЬ: МЕТИЛИРОВАНИЕ ДНК КОММЕНСАЛЬНЫХ *Escherichia coli***

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### **Аннотация**

Соблюдение/установление специальных диет - один из основных пунктов в управлении многих заболеваний. Известно также, что использование определенных продуктов во время болезней может вызвать предсказуемые сдвиги в кишечных бактериальных сообществах. С другой стороны, пробиотики рекомендуются для восстановления неблагоприятных изменений микробиоты кишечника. Более того, пища, обогащенная специальными пробиотиками, может стать основой некоторых диет. Выбор пробиотиков, а также целенаправленная доставка пробиотиков через пищу требует серьезных научно-технических подходов для того, чтобы сохранять/стимулировать рост бактерии-пробиотика посредством синбиотического питания.

Периодическая болезнь (ПБ, PD, FMF, семейная средиземноморская лихорадка) - это аутосомно-рецессивное системное самовоспалительное заболевание, и характеризуется периодическими приступами лихорадки, серозита, синовитом и/или рецидивирующими дерматитами. Для управления ПБ может успешно использоваться диета с низким содержанием соли/жиров. Точная роль кишечных бактерий еще полностью не ясна, но в патогенезе ПБ широко обсуждается важность диалога хозяин-микробиота. Целью настоящего исследования было определение актуальности

исследований метилирования ДНК кишечных комменсальных *E. coli* ПБ пациентов для оценки диалога хозяин-микробиота. Для сбора данных из PubMed (1990-2021) были использованы следующие ключевые слова: *E. coli*, кишечник, FMF и метилирование ДНК.

Анализ литературных данных обосновал важность исследований метилирования ДНК кишечных комменсальных бактерий *E. coli* для оценки диалога хозяин-микробиота во время ПБ.

### **Ключевые слова и фразы**

FMF; *E. coli*; пробиотик; метилирование; ДНК; IBD; кишечная микробиота.

## **Introduction**

It is also known that the intake of particular food might provide predictable shifts in gut bacterial communities in diseases (Singh et al., 2017). On the other hand, probiotics are suggested to restore the unfavourable changes in gut microbiota (Sreeja et al., 2013). Moreover, food enriched with specific probiotics might be the basis of certain diets, but the selection of probiotics and its targeted delivery through food requires serious scientific-technological approaches to stimulate/keep the growth of probiotic through synbiotic nutrition (Terpou et al., 2019).

Although the precise role of gut bacteria in PD pathogenesis is not clear yet, the acceptance of the importance of host-microbiota dialogue in the diseased gut increase (Maynard et al., 2012; van Baarlen et al., 2013). The experiments have identified bacterial DNA and its unmethylated CpG motifs as another microbial stimulus, which can be sensed by cells of the innate immune system, inducing synthesis of an array of cytokines by immune cells (Peter, 2010; Pone et al., 2012).

It is commonly accepted now that gut microbiota maintains the human health-diseases balance (Lozupone et al., 2012) via its interaction with the immune system (Craig et al., 2012, Pepoyan et al., 2018; Galstyan et al., 2018) and can potentially be the target of a well-defined diet for the prevention of various diseases. Noninfectious somatic “nutrition”-relevant diseases like obesity, diabetes type II, metabolic (MD) and cardiovascular diseases (CVD) are also dependent on both the diet and gut microbiota (Tremaroli & Bäckhed, 2012). Candidate mechanisms initiating these pathologies are described (Manco et al., 2010). Moreover, microbiome (genomic), proteomic and metabolomic studies allowed more sophisticated analysis and sampling of these complex systems by culture-independent methods (Weinstock, 2012).

This study aims to clarify if the investigations on DNA methylation of gut commensal *E. coli* in FMF disease have actuality for evaluating host-microbiota dialogue.

## **Material and Methods**

Following keywords: gut microbiota, *E. coli*, gut, FMF, probiotics and DNA methylation were used to collect data from PubMed (1990-2021).

## Results

300 to 500 different species of commensal bacteria that colonize the gastrointestinal tract of mammals (Salzman et al., 2009; Kamada et al., 2013) play an important role in maintaining human health by preventing colonization by pathogens, degrading dietary and *in situ* produced compounds, producing nutrients, shaping and maintaining the normal mucosal and systemic immunity (Lee & Mazmanian, 2010; Clemente et al., 2012; Stecher et al., 2013). Other essential functions of commensal microbiota became apparent, including the influence on the lipid metabolism of the host (Wall R. et al., 2009) and therefore association with obesity (Ley et al., 2006; Turnbaugh et al., 2006, DiBaise et al., 2008) and more peripheral also with intestinal homeostasis, repair and angiogenesis (Sekirov, 2010).

Quorum-sensing systems are widespread in the bacterial world, existing in both Gram-negative and Gram-positive bacteria (Henke & Bassler, 2004; Dubey & Ben-Yehuda, 2011). The populations of bacteria employ a range of signalling strategies to exchange information, like the secretion of quorum-sensing autoinducers and contact-dependent signalling mechanisms (Zeuthen et al., 2006). Certain bacteria carry out collective activities using different quorum-sensing molecules, such as tracking their cell numbers and synchronizing gene expression. Furthermore, Quorum sensing is used to regulate to limit bacterial pathogenesis such as virulence-factor secretion, biofilm formation, conjugation, and antibiotic production (Konga et al., 2006; Feng & Zhou, 2012).

The extensive research materials collected so far witness the relevance of the intestinal microbiota to the pathogenesis of IBD and FMF. It is now generally accepted that stimuli coming from the commensal microbiota influence the immune cells of the gut (Blango & Mulvey, 2009). In healthy individual bacteria-immune cell interactions leads to gut immune homeostasis accompanied by tolerance to the microbiota. The immune system of healthy individuals can discriminate appropriately between pathogens toward which an active immune response should be elicited and harmless bacteria that should be tolerated by the active down-regulation of the immune response. An immune system abnormality in response to normal bacteria has been linked to conditions like food allergies and Crohn's disease (CD) (Shanahan et al., 2004).

Nowadays, enteric microbiota is recognized as an attractive therapeutic target in treating IBD, as dysbiosis is a frequent condition in IBD patients. Interestingly, it has been shown that the bacterial flora of CD patients is different from the one of healthy individuals and also of ulcerative colitis patients (Elinav et al.; 2011; Hao et al.; 2013). The modulation of the gut microbiota with probiotic microbes and prebiotic factors seems to prove helpful in preventing and controlling human diseases (Gill & Guarner, 2004). Based on many clinical and experimental observations, it would be feasible to hold that the characteristics of the luminal milieu embedding the luminal prokaryotic cells influence the balance between luminal prokaryotic and the mucosal eukaryotic human cells and that consequent immunological and humoral local or systemic responses take part in the pathophysiology of Crohn's disease. Therefore, bacteriotherapy seems to play a relevant role in its treatment and prevention.

Furthermore, recent experiments have identified bacterial DNA, and unmethylated CpG motifs in particular, as another microbial stimulus that can be sensed by cells of the innate immune system and induce the synthesis of an array of cytokines by immune cells

(Hotamisligil, 2010; Pone et al., 2012). It is essential to point out that bacteria vary and hence differ in immunostimulatory DNA content.

The DNA of many bacterial (and eukaryotic) species contains 5-methylcytosine (5mC) in addition to cytosine. In *Escherichia coli*, some adenine and cytosine bases are modified to 6-methyladenine and 5-methylcytosine. These modified bases are products of reactions catalyzed by three enzymes that are specified by the host specificity (*hsd*), DNA adenine methylation (*dam*), and DNA cytosine methylation (*dcm*) genes. The methylation reaction occurs on double-stranded DNA in the presence of AdoMet.

Mechanisms of interactions of pathogenic bacteria with the host are well established, but very little is known about the interaction of commensal bacteria with the host. There are some indications only that gut commensals can downregulate the inflammatory responses. The importance of gut commensal *E. coli* was described in several studies (Mirzoyan et al. 2007; Stepanyan et al. 2007; Gasparyan et al. 2013; Pepoyan et al. 2015). The evaluation of the duration of the growth phases for the predominant gut commensal *E. coli* in familial Mediterranean fever (FMF) disease patients revealed that the duration of the preparatory growth phase for the *E. coli* "diseased" strains was shorter. In contrast, the duration of the logarithmic growth phase was longer ( $P < 0.03$ ) than the appropriate growth parameters for the "healthy" isolates (Pepoyan et al., 2017). Moreover, the effects of probiotic strain Narine on the growth of commensal *E. coli* isolates in FMF patients were described (Pepoyan et al., 2017).

Thus, taking into account the above-mentioned information, it is possible to conclude that DNA methylation of gut commensal *E. coli* might be important in the clarification/evaluation of host-microbiota dialogue in FMF disease.

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**PROTECTIVE EFFECT OF BACTERIAL MELANIN ON SUBSTANTIA  
NIGRA IN PARKINSON'S DISEASE**

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**Abstract**

Parkinson's (PD) disease is a common movement disorder in a wide range of neurodegenerative diseases, often associated with gradual personality degradation. The major reason for PD is the progressive disturbance of dopaminergic neurons of the substantia nigra pars compacta. Therefore, therapy aimed at slowing the death of dopaminergic neurons can be effective. In the treatment of neurodegenerative diseases, various kinds of neuroprotectors are successfully used, after which the recovery of lost functions of the central nervous system is accelerated. In the present study, bacterial melanin was used for this purpose.

A comparative study of the morphofunctional state of the cell structures of the compact substantia nigra in rats was conducted on the rotenone model of PD and in combination with the administration of bacterial melanin.

For the morphological and histochemical study, we used the method of detecting the activity of  $\text{Ca}^{2+}$  - dependent acid phosphatase.

The data analysis showed that during rotenone intoxication of the brain, neuronal death and substantia nigra depigmentation are observed, sharp morphological changes in intracellular structures occur, which indicates gross metabolic and morphological



disorders. With the introduction of bacterial melanin, there is a tendency to preserve the typical morphological picture of the neurons of the substantia nigra pars compacta compared to the model of PD. Obtained data give reason to suggest bacterial melanin acts as a neuroprotective agent.

**Keywords and phrases**

Substantia nigra pars compacta, bacterial melanin, PD model.

**ԲԱԿՏԵՐԻԱԼ ՄԵԼԱՆԻՆԻ ՊԱՇՏՊԱՆԻՉ ԱԶԴԵՑՈՒԹՅՈՒՆԸ ՍԵՎ ՆՅՈՒԹԻ ՎՐԱ ՊԱՐԿԻՆՍՈՆԻ ՀԻՎԱՆԴՈՒԹՅԱՆ ԺԱՄԱՆԱԿ**

**ՄԱՐԳԱՐԻՏԱ ԴԱՆԻԵԼՅԱՆ**

ավագ գիտաշխատող

ՀՀ ԳԱԱ ակադ. Օրբելու անվան ֆիզիոլոգիայի ինստիտուտ  
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**Համառոտագիր**

Պարկինսոնի հիվանդությունը համարվում է լայն տարածում ունեցող շարժողական խանգարում և դասվում է նեյրոդեգեներատիվ հիվանդությունների շարքին: Այն հաճախ կապված է անձի անհատականության աստիճանական խաթարման հետ: Պարկինսոնի հիվանդության հիմնական պատճառներն են սև նյութի կոմպակտ մասի դոֆամիներգիկ նյարդաբջիջների պրոգրեսիվ քայքայումն ու մահը: Դոֆամիներգիկ նյարդաբջիջների մահվան դանդաղեցումը կարող է արդյունավետ բուժման եղանակ լինել: Նեյրոդեգեներատիվ հիվանդությունների բուժման համար կիրառում են տարբեր նյարդապաշտպան միջոցներ, որոնց

ներարկումը արագացնում է կենտրոնական նյարդային համակարգի կառույցների գործառույթների վերականգնումը: Կատարվել է առնետների սև նյութի կոմպակտ մասի բջջային կառույցների մորֆոֆունկցիոնալ վիճակի համեմատական հետազոտություն Պարկինսոնի հիվանդության մոդելում՝ համակցված բակտերիալ մելանինի ներարկմամբ: Մորֆոհիստաքիմիական ուսումնասիրության համար օգտագործվել է  $Ca^{2+}$  կախյալ թթու ֆոսֆատազի ակտիվության հայտնաբերման մեթոդը: Ստացված տվյալները ցույց են տվել, որ ուղեղի ռոտենոնային թունավորման ժամանակ նկատվում են նեյրոնի մահ և սև նյութի գունազրկում, տեղի են ունենում ներբջջային կառուցվածքների կտրուկ մորֆոլոգիական փոփոխություններ, ինչը վկայում է նյութափոխանակության և մորֆոլոգիական կոպիտ խանգարումների մասին: Իսկ բակտերիալ մելանինի ներարկման ժամանակ դիտվում է սև նյութի կոմպակտ մասի նյարդաբջիջների նորմալ մորֆոֆունկցիոնալ պատկերի պահպանման միտում՝ ի տարբերություն Պարկինսոնի հիվանդության մոդելի: Ստացված տվյալները հիմք են հանդիսանում եզրակացնելու, որ բակտերիալ մելանինը գործում է որպես նյարդապաշտպան գործոն:

#### **Բանալի բառեր և բառակապակցություններ**

Սև նյութի կոմպակտ բաժին, բակտերիալ մելանին, Պարկինսոնի հիվանդության մոդել:

## **ЗАЩИТНОЕ ДЕЙСТВИЕ БАКТЕРИАЛЬНОГО МЕЛАНИНА НА ЧЕРНУЮ СУБСТАНЦИЮ ПРИ БОЛЕЗНИ ПАРКИНСОНА**

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### **Аннотация**

Болезнь Паркинсона является распространенным двигательным расстройством в широком спектре нейродегенеративных заболеваний, нередко связанная с постепенной деградацией личности. Основной причиной болезни Паркинсона является прогрессирующее разрушение и гибель дофаминергических нейронов компактной части чёрной субстанции. Поэтому эффективной может стать терапия, направленная на замедление гибели дофаминергических нейронов. При лечении нейродегенеративных заболеваний успешно применяются разного рода нейропротекторы, после введения которых ускоряется восстановление утраченных функций структур центральной нервной системы. В настоящем исследовании с этой целью был использован бактериальный меланин. Было проведено сравнительное изучение морфофункционального состояния клеточных структур компактной части чёрной субстанции крыс на ротеноновой модели болезни Паркинсона и в сочетании с введением бактериального меланина. Для морфогистохимического исследования использовали метод выявления активности  $Ca^{2+}$ -зависимой кислой фосфатазы. Анализ полученных данных показал, что при ротеноновой интоксикации мозга отмечаются гибель нейронов и депигментация черной субстанции, происходят резкие морфологические изменения внутриклеточных структур, что свидетельствует о грубых метаболических и морфологических нарушениях. При введении же бактериального меланина наблюдается тенденция к сохранению нормальной морфологической картины нейронов компактной части чёрной субстанции по сравнению с моделью болезни Паркинсона. Полученные данные дают основание полагать, что бактериальный меланин действует в качестве нейропротекторного агента.

### **Ключевые слова и фразы**

Компактная часть черной субстанции, бактериальный меланин, модель болезни Паркинсона.

## Introduction

Parkinson' disease is the most common form of parkinsonism, a group of neurological disorders associated with movement problems such as stiffness, sluggishness, and tremors. More than 6 million people worldwide suffer from PD. It is a heterogeneous disease with rapidly and slowly progressive forms [1]. Studies have shown that the main cause of PD is the progressive destruction and death of neurons that produce the neurotransmitter dopamine [2], which are located in the substantia nigra pars compacta (SNc), as well as their nerve endings located in the striatum [3]. Damage to nerve cells occurs according to the so-called abiotrophic type, manifested in a progressive loss of viability, gradual degeneration, leading to pathological conditions and loss of functions, and are mainly manifested in the formations included in the extrapyramidal and vegetative nervous systems [4].

Dopaminergic neurons SNc are pigmented due to the accumulation of oxidative metabolism of the neurotransmitter dopamine, the precursor neuromelanin. Neuromelanin in SNc is sensitive to a wide range of toxic agents, acting as a system capable of providing neuronal damage [5]. It has been established that inflammatory factors can lead to the death of dopaminergic SNc neurons. Acceleration of death of dopaminergic neurons SNc is triggered by the processes that include sources of oxidative stress [6]. Combination therapy aimed at slowing the death of dopaminergic neurons and excluding the progression of non-dopaminergic symptoms that develop in the last stage of PD can be effective [7]. In recent decades, various types of neuroprotectors have been successfully used in the treatment of neurodegenerative diseases, after the introduction of which the restoration of the lost functions of the structures of the central nervous system is accelerated. In the present study, bacterial melanin (BM) was used for this purpose.

The water-soluble BM obtained biotechnologically can be a potential biological, medical product for treating neurodegenerative diseases (including PD). BM has a high biological activity and bio stimulating effect [8]. The example of the lateral hypothalamus of rats showed that the melanin-concentrating hormone suppresses the synaptic activity of glutamate and GABAergic neurons [9]. BM can promote the survival of neurons in SN under the influence of toxic factors and suppress the inflammatory process [10]. The restoration of the balancing movement of the paralyzed limb in rats was studied using various models of neurodegeneration. It was shown that the introduction of BM reduces the recovery time of the conditioned reflex several times. The ability of melanin to stimulate regeneration processes in the nervous tissue was proved, and it was shown that BM promotes sprouting of nerve fibres, restores conductivity in the motor tract after its damage. Under the influence of BM, vascularization of the cortex is enhanced

due to the expansion of the lumen of the vessels and the opening of new branches in the capillary network, which leads to a significant increase in brain tropism, ensures the safety of nerve cells, which contributes to the rapid restoration of impaired motor functions [11]. BM may promote the rapid activation of stem cell division since it exhibits those qualities necessary for the structural and functional recovery of the central nervous system after trauma [12]. Studies using BM have shown that the substance does not cause microgliosis and has no toxic side effects [13].

This work aimed to study the effect of BM on the morphofunctional state of the substantia nigra using an experimental model of PD. A morphofunctional study of the compact part of the substantia nigra of intact rats after rotenone intoxication (PD model) and in combination with BM injections was carried out.

### **Material and methods**

The rotenone PD model is used to study the mechanisms of damage to dopaminergic neurons and assess neurochemical, behavioural, and cognitive manifestations, particularly up to 4 weeks of survival [14]. The experiments were carried out on 15 white male rats (220-250 g.) in three series:

1) intact rats (n = 5); 2) on the model of PD induced by unilateral administration of rotenone and kept for 4 weeks (n = 5); and 3) unilaterally injected with rotenone, similar to series (2), in combination with i.p. injection of bacterial melanin (175 mg / kg, optimal tolerated dose for rats) every other day for 4 weeks - 7 injections (n =5). Rotenone was administered under anesthesia (pentobarbital, 40 mg / kg, i.p., 12 µg in 0.5 µl Dimexide at a rate of 1 µl / min) in a medial forebrain bundle at coordinates (AP + 0.2; L ± 1.8; DV + 8 mm) stereotaxic atlas [15]. The animals were kept under the same conditions during the entire postoperative time (4 weeks) before the acute experiment. The experimental protocol satisfied the provisions of the European Communities Council Directive (2010/63/UE). The Ethics Committee approved Yerevan State Medical University after Mkhitar Heratsi (N4 IRB APPROVAL, 15 November 2018).

Morphological and histochemical studies were carried out by the method of revealing of

Ca<sup>2+</sup>-dependent acid phosphatase activity [16]. The method is a variation of Nissl staining and Golgi silver impregnation. For morphohistochemical study in animals under anaesthesia (40 mg/kg, i.p.), the brain was taken, which was fixed in a 5% solution of neutral formalin, prepared in 0.1 M phosphate buffer (pH = 7.4), for 48 hours at + 4 ° C. Frozen frontal sections, 40-50 µm thick, were prepared from the brain blocks, which, according to the requirements of further processing, were transferred into a freshly prepared incubation mixture. The finished preparations were analyzed under a

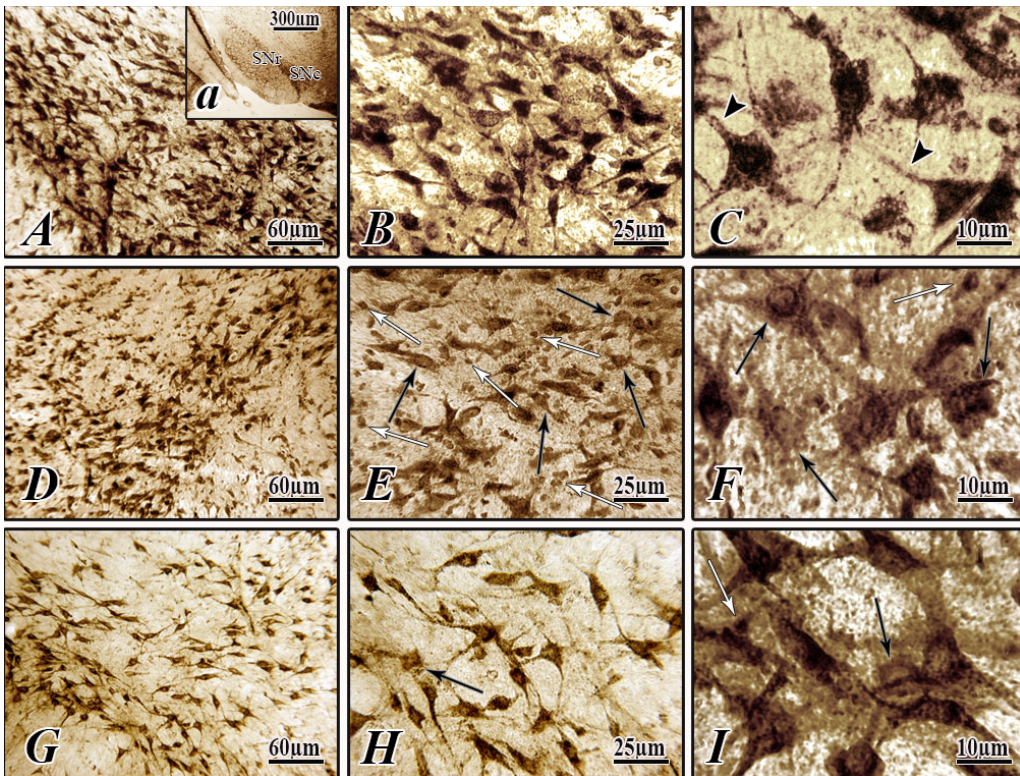
light-optical microscope. The subsequent shooting of the obtained preparations was carried out using a photo attachment (*Model FMA050, Amscope MU800 8 MP (USA)*) through a microscope *OPTON (West Germany)*.

## **Results and discussion**

The substantia nigra refers to the extrapyramidal system. It has a complex structure and abundant blood supply, which indicates the significant role of its components in the coordination system of vital functions. It consists of three parts, the main of which are the pars reticulata and pars compacta (Fig. 1 a). Analysis of morphohistochemical data showed that in intact animals, triangular, elongated and polygonal neurons, rich in neuromelanin pigment, are found in the SNc (Fig. 1 A-C). Fine-grained or clumpy melanin diffusely fills almost the entire cytoplasm of SNc nerve cells (Fig. 1 C). Nerve cells have long axons, several branching processes (Fig. 1 B, C). In the axons of multipolar SNc cells, alternating light and dark areas are observed, which gives the impression of cross-striation (Fig. 1 C). Most likely, these dark areas correspond to regions of high acid phosphatase activity. SNc neurons are intensely coloured, which is explained by a high level of metabolism, which, apparently, is associated with the pigment-forming function of this structure [17]. Among SNc neurons, a moderate reaction of glial cell nuclei is observed (Fig. 1 A), which is characteristic of the norm.

Under conditions of rotenone intoxication, there is a decrease in the density of SNc neurons, a violation of cytoarchitecture compared to the norm (Fig. 1 D, E). In the cytoplasm of the nerve cell, lysis of the granules of the chromatophilic substance is noted up to its clarification. Neuronal damage occurs in varying degrees of severity (Fig. 1 E, F). There is depigmentation of SNc neurons, and there are cells with a complete absence of melanin. That is, there is a release of the melanin from damaged cells. The cells have a disrupted characteristic polygonal shape; there is no clear delineation of cell groups (Fig. 1 E, F). Some polygonal SNc cells acquire a spherical shape because they swell, the cell body increases in size and processes shorten or disappear (Fig. 1 F). But most neurons have an elongated or triangular shape, the contours of the cells become irregular, indistinct, the border between the body and processes is not visible. They react with long shoots, in which the precipitate of lead phosphate is dusty or fine-grained. The cytoplasm shows a swollen nucleus with an eccentrically located dark nucleolus (Fig. 1 F). In some neurons, a coarse-clumpy precipitate of lead phosphate is unevenly distributed in the cell body, which indicates a possible complete decay; dendrites are thickened and shortened. Among degenerated SNc neurons, homogeneously stained nuclei of glial cells are clearly distinguished in significant numbers (Fig. 1 E, F).

Thus, with rotenone intoxication of the brain, neuronal death and SNc depigmentation are noted, and abrupt morphological changes in intracellular structures occur, indicating gross metabolic and morphological disorders. There are different degrees of damage to the SN cell structures. The morphological picture of SNc neurons after rotenone intoxication reveals changes in the nerve cell's primary stimulation. Usually, this condition is a reversible cellular process; however, with the deepening of the neurodegenerative process, the cell can die, undergoing vacuolization, lysis or pyknosis.



*Figure 1.* Micrographs of cellular structures of the substantia nigra pars compacta of intact (A-C) and experimental (D-I) rats (D-F - in conditions of rotenone intoxication; G-I - in conditions of rotenone intoxication in combination with regular administration of bacterial melanin). D-F - violation of the shape, size and contours of cells, clarification of the cytoplasm, gliosis; G-I - positive changes in the structural properties of neurons, high phosphatase activity in the cytoplasm and processes of neurons, clear contours) (black arrow - chromatolysis; white arrow - glial nuclei; black head of the arrow - cross-striation in the processes of neurons). SNc - the substantia nigra pars compacta; SNr - substantia nigra pars reticulata.

Magnification.: ×25 (a); ×160 (A, D, G); ×400 (B, E, H); ×1000 (C, F, I).

In animals that received an injection of rotenone in combination with melanin injections, the characteristic shapes and sizes of SNc cells were largely preserved. The cytoplasm is intensely coloured; a light-coloured centrally located nucleus is visible in it. Neurons show thin, long processes (Fig. 1 G-I). In SNc, along with cells that retained their shape and size, affected neurons are rarely detected. CP activity is weak, processes are not detected, but the nucleus is centrally located (Fig. 1 I).

In some cases, cells with short processes are observed; they are light -coloured, and their nuclei are eccentrically located (Fig. 1 H). In general, under the influence of bacterial melanin, the morphological picture of SN neurons is observed, which is close to normal. In the intercellular space, against the background of preserved or partially damaged SN neurons, glial nuclei are locally found. A protective reaction of glial cells in relation to neurons occurs (Fig. 1 I).

### **Conclusions**

Research results show that lesions of the neurons of the substantia nigra pars compacta in Parkinson's disease occur according to the so-called abiotrophic type [18]. The affected nerve cells undergo pronounced atrophy, significant changes in the cytoplasm and nucleus occur inside the cells, and pathological changes in the neuroglia are noted. With the regular introduction of bacterial melanin after rotenone injection, positive changes in the structural properties of neurons are observed in the substantia nigra pars compacta compared to the rotenone model of PD. The morphological picture of neurons is close to normal, the shape and size of the cells are preserved, the reaction of the glial nuclei is moderate. In most neurons of the substantia nigra, long processes react, which is important for maintaining intercellular contacts. An increase in phosphatase activity is observed in the cytoplasm of cells, which indicates the activation of metabolic processes aimed at maintaining the body's homeostasis, disturbed as a result of rotenone intoxication. The therapeutic effect of bacterial melanin use is apparently due to a beneficial effect on the modulation of the secondary inflammatory process and inhibition of microgliosis, and an improvement in the tropism of brain tissue [19]. The data obtained allow us to conclude that bacterial melanin plays a certain neuroprotective role, accelerating compensatory recovery in the central nervous system against the background of developing neurodegenerative changes inherent in PD.



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02.04.2021 թ.:

**ВЛИЯНИЕ МАГНИТНОГО ПОЛЯ НА СВЕРХПРОВОДЯЩИЕ И НОРМАЛЬНЫЕ  
ХАРАКТЕРИСТИКИ ПОЛИКРИСТАЛЛОВ  $YBa_2Cu_3O_x$ , ПОДВЕРГАЮЩИХСЯ  
ВРЕМЕННОЙ ДЕГРАДАЦИИ**

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**Аннотация**

Изучено влияние постоянного магнитного поля на сверхпроводящие и нормальные характеристики поликристаллов  $YBa_2Cu_3O_x$  ( $Y123$ ), длительное время содержащихся при комнатной температуре, пользуясь кривыми удельного сопротивления  $r(T)$  при постоянном транспортном токе 10mA в температурном интервале (77-290)K. В качестве сверхпроводящих характеристик рассмотрены ширина сверхпроводящего перехода ( $\Delta T_c$ ) и его критическая температура ( $T_c$ ). Причем  $T_c$  определена по температурам, соответствующим началу, середине и концу перехода ( $T_c^{on}$ ,  $T_c^{0.5}$  и  $T_c^0$ ). А в качестве нормальной характеристики рассмотрена магнитно-полевая зависимость удельного сопротивления (магнитосопротивление) в флуктуационном диапазоне ( $T_c^0 < T < T_c^{on}$ ). Показано, что в зависимости от магнитного поля все рассматриваемые характеристики проявляют монотонное поведение. Причем параллельно увеличению магнитного поля критическая температура не только уменьшается, но и проявляет аномальный рост, максимальное значение

которого для  $T_c^{on}$ ,  $T_c^{0.5}$  и  $T_c^0$  составило соответственно 5.3K, 4.2K и 2.9K, что означает, что в зависимости от магнитного поля наиболее нестабильна  $T_c^{on}$ . А в зависимости от магнитного поля синхронное изменение  $T_c^{on}$  свидетельствует о том, что обе характеристики обусловлены одним и тем же механизмом. Выявлено, что поведение магнитосопротивления в флуктуационном диапазоне строго зависит от температуры. Выяснилось, что при 92K во всем диапазоне примененного магнитного поля наблюдается отрицательное магнитосопротивление. Тогда как при более высоких температурах наблюдается как отрицательное, так и положительное магнитосопротивление. Помимо этого, выяснилось, что изменение сверхпроводящих и нормальных характеристик в зависимости от магнитного сопротивления протекает обратными фазами, т.е. в случае изменения магнитного поля рост одного сопровождается одновременным сокращением другого, и наоборот.

Разъяснение полученных результатов произведено в рамках модели структурных неоднородностей на микроскопическом уровне в образцах, подвергнутых временной деградации.

#### **Ключевые слова и фразы**

Высокотемпературный сверхпроводник (ВТСП), сверхпроводящий переход (СП), ширина СП, температура начала, середины и конца СП ( $\Delta T_c$ ,  $T_c^{on}$ ,  $T_c^{0.5}$  и  $T_c^0$ ), магнитосопротивление.

### **ՄԱԳՆԻՍԱԿԱՆ ԴԱՇՏԻ ԱԶԴԵՑՈՒԹՅՈՒՆԸ ԺԱՄԱՆԱԿԱՅԻՆ ԴԵԳՐԱԴԱՑԻԱՅԻ ԵՆԹԱՐԿԱՎԱԾ $YBa_2Cu_3O_x$ ԲԱԶՄԱԲՅՈՒԵՂՆԵՐԻ ԳԵՐՀԱՂՈՐԴՉԱՅԻՆ ԵՎ ՆՈՐՄԱԼ ԲՆՈՒԹԱԳՐԵՐԻ ՎՐԱ**

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ՀՀ ԳԱԱ գիտակրթական միջազգային կենտրոնի  
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### Համառոտագիր

Ուսումնասիրվել է արտաքին հաստատուն մագնիսական դաշտի կիրառման ազդեցությունը սենյակային պայմաններում երկարատև պահված  $YBa_2Cu_3O_x$  բազմաբյուրեղների (Y123) գերհաղորդչային և նորմալ բնութագրերի վրա՝ օգտվելով ջերմաստիճանների (77-290)K տիրույթում 10mA հաստատուն տրանսպորտային հոսանքի դեպքում որոշված տեսակարար դիմադրության  $r(T)$  կորերից: Իբրև գերհաղորդչային բնութագրեր՝ դիտարկվել են գերհաղորդչային անցման լայնությունը ( $\Delta T_c$ ) և նրա կրիտիկական ջերմաստիճանը ( $T_c$ ): Ընդ որում,  $T_c$ -ն որոշվել է անցման սկզբին, միջնակետին և վերջին համապատասխանող ջերմաստիճաններով ( $T_c^{on}$ ,  $T_c^{0.5}$  և  $T_c^0$ ): Իսկ որպես նորմալ բնութագիր դիտարկվել է տեսակարար դիմադրության մագնիսադաշտային կախվածությունը (մագնիսադիմադրություն) ֆլուկտուացիոն տիրույթում ( $T_c^0 < T < T_c^{on}$ ): Ցույց է տրվել, որ դիտարկվող բոլոր բնութագրերն էլ մագնիսական դաշտից կախված դրսևորում են ոչ մոնոտոն վարքագիծ: Ընդ որում, մագնիսական դաշտի մեծացմանը զուգընթաց կրիտիկական ջերմաստիճանը ոչ միայն նվազում է, այլ նաև դրսևորում է անոմալ աճ, որի առավելագույն չափը  $T_c^{on}$ -ի,  $T_c^{0.5}$ -ի և  $T_c^0$ -ի համար համապատասխանաբար կազմել է 5.3K, 4.2K և 2.9K, ինչը նշանակում է, որ մագնիսական դաշտից կախված ամենամեծ անկայունություն ունի  $T_c^{on}$ -ն: Իսկ մագնիսական դաշտից կախված  $T_c^{on}$ -ի և  $\Delta T_c$ -ի համափոփ փոփոխությունը վկայում է այն մասին, որ երկու բնութագրերն էլ պայմանավորված են միևնույն մեխանիզմով: Բացահայտվել է, որ ֆլուկտուացիոն տիրույթում մագնիսադիմադրության դրսևորած վարքագիծը խստորեն կախված է ջերմաստիճանից: Պարզվել է, որ 92K-ում կիրառված մագնիսական դաշտի ամբողջ տիրույթում դիտվել է բացասական մագնիսադիմադրություն: Մինչդեռ ավելի բարձր ջերմաստիճաններում դիտվում է ինչպես բացասական, այնպես էլ դրական մագնիսադիմադրություն: Բացի դրանից, բացահայտվել է, որ գերհաղորդչային և նորմալ բնութագրերի փոփոխությունը, մագնիսական դաշտից կախված, ընթանում է հակառակ փուլերով, այսինքն՝ մագնիսական դաշտի փոփոխության դեպքում մեկի աճը ուղեկցվում է մյուսի համաժամանակյա նվազումով, և՛ հակառակը:

Ստացված արդյունքների մեկնաբանությունը կատարվել է ժամանակի ընթացքում դեգրադացված նմուշներում միկրոսկոպիկ մակարդակով առկա կառուցվածքային անհամասեռությունների մոդելի շրջանակներում:

## **Բանալի բառեր և բառակապակցություններ**

Բարձր ջերմաստիճանային գերհաղորդիչ (ԲՋԳՀ), գերհաղորդչային (ԳՀ) անցում, ԳՀ անցման լայնություն, ԳՀ անցման սկզբի, միջնակետի և վերջի ջերմաստիճան՝ ( $\Delta T_c$ ,  $T_c^{on}$ ,  $T_c^{0.5}$  և  $T_c^0$ ), մագնիսադիմադրություն:

## **THE INFLUENCE OF THE MAGNETIC FIELD ON SUPERCONDUCTING AND NORMAL CHARACTERISTICS OF YBA2CU3OX POLYCRYSTALS SUBJECT TO TIME DEGRADATION**

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## **Abstract**

The effect of a constant magnetic field on the superconducting and normal characteristics of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub> (Y123) polycrystals, preserved at room temperature for a long time, was examined using the resistivity curves  $r(T)$  at a constant transport current of 10mA in the temperature range (77-290) K. The width of the superconducting transition ( $\Delta T_c$ ) and its critical temperature ( $T_c$ ) were considered as superconducting

characteristics. Moreover, TC was determined by the temperatures corresponding to the onset, middle, and end of the transition ( $T_c^{on}$ ,  $T_c^{0.5}$ , and  $T_c^0$ ).

Given the fact that the magnetic-field dependence of resistivity (magnetoresistance) is considered as a normal characteristic in the fluctuation range ( $T_c^0 < T < T_c^{on}$ ), it is shown that all the characteristics under consideration expose monotonic behavior depending on the magnetic field. Moreover, parallel to the increase in the magnetic field, the critical temperature not only decreases but also shows an anomalous growth, the maximum value of which for  $T_c^{on}$ ,  $T_c^{0.5}$  and  $T_c^0$  was accordingly 5.3K, 4.2K and 2.9K, which means that depending on the magnetic field,  $T_c^{on}$  is most unstable. Depending on the magnetic field, asynchronous change in  $T_c^{on}$  indicates that both characteristics are conditioned by the same mechanism. It has been revealed that the behavior of the magnetoresistance in the range of fluctuation is strictly temperature-dependent. It has also been found out that negative magnetoresistance is observed over the entire range of the applied magnetic field at 92 K, whereas at higher temperatures, both negative and positive types of magnetoresistance are observed. Also, it was proved that changes in superconducting and normal characteristics, depending on the magnetic resistance, occur in reverse phases, i.e. in the case of a change in the magnetic field, the growth of one is accompanied by a simultaneous contraction of the other and vice versa.

The results obtained were observed within the framework of the model of structural inhomogeneities at a microscopic level in samples subjected to temporary degradation.

### **Keywords and phrases**

High-temperature superconductor (HTS), superconducting transition (ST), ST width, onset, the middle and final temperature of ST ( $\Delta TC$ ,  $T_c^{0.5}$ ,  $T_c^{0.5}$  and  $T_c^0$ ), magnetoresistance.

### **Предисловие**

Механизм сверхпроводимости на микроскопическом уровне, действующий в высокотемпературных сверхпроводниках, до сих пор полностью не выявлен, и это затрудняет синтез новых сверхпроводящих образцов с высокими критическими характеристиками, а следовательно, ограничивает их применение в различных сферах [1,2]. При наличии на микроскопическом уровне неоднородностей в ВТСП наблюдается такое аномальное проявление сверхпроводящих и нормальных свойств, как, например, формирование псевдозонального режима [1,2], увеличение критической температуры ( $T_c$ ) сверхпроводящего перехода [3,4] и появление

отрицательного магнитосопротивления в примененном постоянном магнитном поле [5]. Анализ работ в этом направлении показал, что эти явления чувствительны в отношении размеров сверхпроводящих крупинок исследуемых образцов, различного вида и количества структурных дефектов, присутствующих в них, внешних давлений, тепловых воздействий, а также транспортных токов [1,2,6,7]. Известно, что после синтеза в приповерхностных частях крупинок сверхпроводящих поликристаллов, длительное время содержащихся в комнатных условиях (“состарившихся”), возникает аморфный слой толщиной до 2.0 нм, который включает в себе дополнительные плоскости Си-О длиной 20 нм [9, 10]. В таких образцах изменения характеристик, наблюдаемые под воздействием внешних факторов, могут проявлять определенные особенности по сравнению со свежевывращенными образцами. Целью данной работы является изучение путем определения удельного сопротивления влияния постоянных магнитных полей на ширину сверхпроводящего перехода, критические температуры и магнитосопротивление в флуктуационном диапазоне поликристаллов  $YBa_2Cu_3O_x$  (Y123), длительное время содержащихся в комнатных условиях. Такие исследования могут способствовать расширению наших представлений о механизме сверхпроводимости и его временной деградации, действующем в высокотемпературном сверхпроводнике.

### **Подробности проведения эксперимента**

Исследуемые ВТСП Y123 образцы синтезировались стандартным методом и до измерений хранились 7 лет в комнатных условиях [11, 12]. Исследуемые образцы имели объемную плотность  $4,8 \text{ г/см}^3$ . При значениях постоянного магнитного поля 450 Ое, 1275 Ое, 1651 Ое и 1725 Ое были определены сверхпроводящие и нормальные характеристики образцов. С этой целью использовались кривые температурной зависимости удельного сопротивления  $r(T)$  в температурном диапазоне (77-290)К в случае постоянного транспортного тока 10mA и указанных магнитных полей. Исследуемые образцы имели форму прямоугольного параллелепипеда с характерными размерами  $6 \times 2 \times 1 \text{ мм}^3$ . Транспортный ток был применен параллельно к длинной стороне образца и вертикально к магнитному полю. Критическая температура сверхпроводящего перехода определялась началом ( $T_c^{on}$ ), серединой ( $T_c^{0.5}$ ) и концом ( $T_c^0$ ) перехода, когда удельное сопротивление нормального состояния образца уменьшалось соответственно на 10, 50 и 90 процентов. Первая и вторая из этих температур характеризуют начало и конец сверхпроводящего состояния крупинок, а третья – установление между ними джозефсоновского контакта, когда образец почти всем своим объемом (90%)



переходит в сверхпроводящее состояние, т.е. приобретает нулевое сопротивление. В вышеприведенных магнитных полях определялась также ширина СП перехода:  $\Delta T_c = T_c^{on} - T_c^0$  и магнитосопротивление  $r(T, H)$  при различных температурах в диапазоне  $T_c^0 < T < T_c^{on}$ .

### Полученные результаты и их обсуждение

На рис.1 изображены линии магнитополевой зависимости ширины сверхпроводящего перехода ( $\Delta T_c$ ) и критических температур ( $T_c^{on}$ ,  $T_c^{0.5}$ ,  $T_c^0$ ) для значений постоянного магнитного поля 0, 450 Ое, 1275 Ое и 1725 Ое. А на рис.2 приведены кривые магнитосопротивления  $r(H, T)$  для различных температур в диапазоне  $T_c^0 < T < T_c^{on}$ .

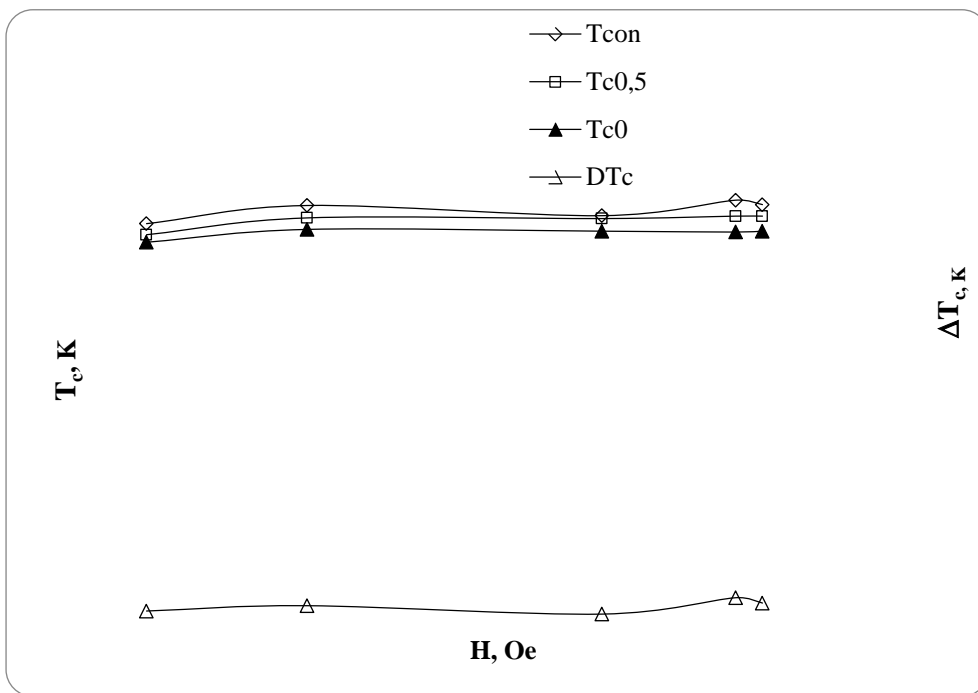


Рис.1. Зависимость ширины сверхпроводящего перехода ( $\Delta T_c$ ) и критических температур ( $T_c^{on}$ ,  $T_c^{0.5}$  и  $T_c^0$ ) от магнитного поля.

Из этих рисунков видно, что в зависимости от магнитного поля все исследуемые характеристики проявляют немонотонное поведение. Так, когда магнитное поле растет в диапазоне от 0 до 1725 Ое, то для  $T_c^{on}$ ,  $T_c^{0.5}$  и  $T_c^0$  наблюдаются соответственно следующие значения: [91.7К, 95.8К, 93.5К, 97К, 96К], [89.2К, 93К, 92.85К, 93.4К, 93.4К], и [87.5К, 90.4К, 90К, 89.8К, 90К]. Во всем диапазоне приложенных магнитных полей максимальный рост  $T_c^{on}$  по

отношению к начальному значению составляет 5.3К, тогда как для  $T_c^{0.5}$  и  $T_c^0$  он составляет соответственно 4.2К и 2.9К. Таким образом, по сравнению с температурами  $T_c^{0.5}$  и  $T_c^0$   $T_c^{on}$  в зависимости от магнитного поля проявляет более сильно выраженное нестабильное поведение (Рис.1). Отметим, что немонотонное поведение кривой магнитолевой зависимости ширины перехода ( $\Delta T_c$ ) свидетельствует о неопределенности образца (Рис.1). Об этом свидетельствуют также кривые магнитосопротивления при различных температурах (Рис.2). Отметим также, что синхронное поведение кривых  $\Delta T_c(H)$  и  $T_c(H)$  означает, что за изменение этих характеристик отвечают одни и те же механизмы. Ширина перехода обусловлена уровнем упорядоченности атомов в сверхпроводящих крупинках (плоскости  $CuO_2$ ) и в пространстве между крупинками. Он в основном определяется концентрацией атомов кислорода, присутствующих в указанных позициях пространственной решетки системы Y123 и сдвинувшихся от своих ключевых позиций [13]. Когда вследствие воздействия некоторых внешних факторов эта концентрация растет или уменьшается, то сверхпроводящие и нормальные характеристики соответственно сокращаются или растут.

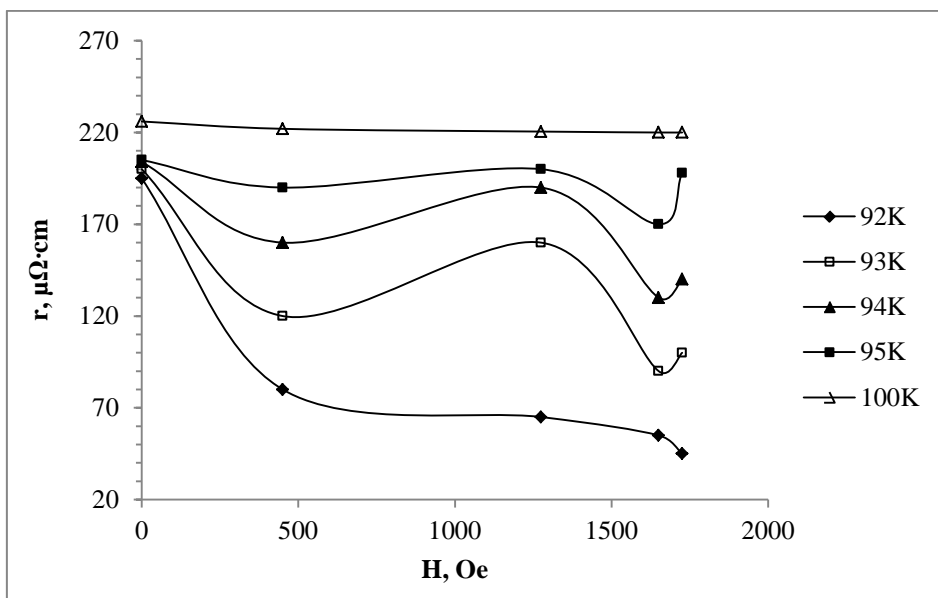


Рис.2. Зависимость удельного сопротивления от приложенного магнитного поля (магнитосопротивление) при разных температурах

При увеличении внешнего магнитного поля наблюдалось аномальное явление: критическая температура вместо уменьшения растет [3,4]. Так, в образцах  $Y_{1-x}Pr_xBa_2Cu_3O_{7-\delta}$  ( $x=0.25$ ;  $x=0.5$ ) рост  $T_c$ , наблюдаемый при увеличении поля в интервале 5-100 Oe, относится к структурным изменениям, происходящим в плоскостях Cu-O<sub>2</sub>. В многофазных висмутовых ВТСП образцах, хранившихся при температуре 77К и наличии постоянного магнитного поля 1500 Oe, наблюдался рост  $T_c$ , соответствующий различным сверхпроводящим фазам [4]. Показано также, что в хранящихся при 77К образцах увеличивается напряжение как в границах межфазного разделения, так и на концах сверхпроводящих крупинок, что способствует увеличению плотности дефектов и усилению пиннинга вихрей Абрикосова. Недавно выяснилось, что замещение ионов  $Y^{3+}$  ионами  $Tm^{3+}$ , действительно, приводит к увеличению собственного пиннинга магнитных бурь в монокристаллах в магнитном поле 400 Oe [14]. Это близко к тому значению поля (450 Oe), когда нами наблюдается рост критических температур (Рис.1), который сопровождается резким одновременным уменьшением удельного сопротивления (Рис.2). Аналогичное явление (когда  $H=0$ ) ранее наблюдалось нами после подвержения кратковременной тепловой обработке состарившихся образцов Y123 и приписывалось сокращению роли взаимодействия электрон-фонон в механизмах рассеивания. Стоит упомянуть, что ранее облучение малыми дозами быстрых нейтронов также приводило к росту критических температур и уменьшению сопротивления образцов Y123. Изменение обеих этих характеристик сопровождается ростом сигнала электронного парамагнитного резонанса, связанным с возникновением центров  $Cu^{2+}$  и перемещением зарядов от поверхностей Cu(1) к поверхностям  $CuO_2$  [16]. Отметим также, что в указанной работе предварительные и постоблученные характеристики как сверхпроводящего, так и нормального состояния с большой точностью совпадают с соответствующими характеристиками, полученными в данной работе для образцов с применением магнитного поля. Причем изменения  $T_c^{on}$  в зависимости как от дозы облучения, так и от величины приложенного магнитного поля проявляют строго выраженное осцилляционное поведение. Тогда как для  $T_c^{0.5}$  оно достаточно близко к монотонному. Сравнение показывает, что увеличение дозы облучения и рост приложенного внешнего магнитного поля при низких температурах (92К) приводили к монотонному сокращению удельного сопротивления нормального состояния образца. Отметим, что при высоких температурах эти изменения в обоих случаях протекают немонотонным образом (Рис.2). То есть, если при 92К на всем участке магнитного поля наблюдается отрицательное магнитосопротивление, то при более высоких температурах параллельно увеличению поля сферы отрицательного магнитосопротивления чередуются один за другим. И при 100К зависимость

удельного сопротивления от магнитного поля вообще аннулируется (Рис.2). Толкование полученных результатов можно выполнить в границах модели неоднородного распределения структурных дефектов, присутствующих в сверхпроводящих крупинках. Как уже было отмечено в предисловии, в приповерхностных частях крупинок иттриевых образцов, состарившихся в результате длительного нахождения на воздухе, возникает аморфный слой толщиной 2 нм, включающий в себя дополнительные плоскости Cu-O длиной 20 нм [9]. Одновременно в образцах возникают также сверхпроводящие фазы, бедные и богатые кислородом, которые обнаруживают соответственно малое и большое значение критической температуры и поля [10]. По нашим результатам можно предположить, что СП крупинки каждой из этих фаз внешне покрыты аморфным слоем, как в многофазных висмутовых образцах [17]. Аморфный слой, окружающий сверхпроводящие крупинки, для абрикосовых вихрей до 450 Oe служит центром пиннинга, который осложняет их проникновение в крупинки и, следовательно, предотвращает диссипационные процессы. А это приводит как к увеличению критической температуры, так и к увеличению удельного сопротивления в магнитном поле (Рис.1 и 2). Однако в случае большого магнитного поля (1275 Oe) и более высоких температур вихри, отрываясь от этих центров, начинают свободно перемещаться в сверхпроводящих крупинках (плоскости  $\text{CuO}_2$ ), что приводит к распаду сверхпроводящих пар, а следовательно, к дальнейшему увеличению сопротивления и уменьшению  $T_c$ . А в случае дальнейшего роста магнитного поля (1650 Oe) в процессе начинает участвовать богатая кислородом сверхпроводящая фаза, имеющая более высокую  $T_c$  и большое критическое поле крупинок и магнитные вихри захватываются поверхностным слоем, обуславливая рост  $T_c$  и уменьшение сопротивления. Для следующего значения примененного поля (1725 Oe) происходит обратный процесс: рост сопротивления и сокращение  $T_c$ . Как видим, магнитосопротивление весьма зависит от температуры (Рис.2). Причем, если при 92K в зависимости от магнитного поля оно проявляет монотонное поведение, то параллельно с увеличением температуры приобретает сильно выраженное немонотонное поведение, а при 100K становится независимым от магнитного поля. При 92K наблюдаемое монотонное сокращение удельного сопротивления в случае роста магнитного поля обусловлено также тем, что объемная плотность наших образцов равна 4,8 г/см<sup>3</sup>, при которой связи между крупинками, установившиеся в системе Y123, самые прочные, имеют максимальную однородность и критическая температура самая высокая – 92K [18]. Она почти совпадает с критической температурой наших образцов:  $T_c^{\text{on}}=91.7\text{K}$  (Рис.1). Стоит отметить следующие особенности. Сравнение сверхпроводящих характеристик и магнитопольевых кривых удельного сопротивления показывает, что они изменяются обратными фазами

(Рис.1 и 2). То есть в случае изменения магнитного поля рост одного сопровождается одновременным сокращением другого, и наоборот. Структурные дефекты, возникшие в поликристаллических сверхпроводниках Y123, хранившихся 7 лет в комнатных условиях после облучения малыми дозами ( $10^{11}$ ,  $10^{12}$ ,  $10^{13}$  н/см<sup>3</sup>) быстрыми нейтронами и синтезирования, весьма схожи своим характером. Интересно отметить, что в работе [10] показано, что образцы Y123, хранящиеся 10 лет после синтезирования в комнатных условиях, проявляют такое же структурное состояние, какое устанавливается в них после подвержения 100-часовой тепловой обработке при 200 °С. Магнитное поле не в состоянии прямо вызвать в ВТСП структурные дефекты. Однако оно может обнаружить уже присутствующие в образцах дефекты. Магнитное поле может возбудить диссипационные процессы, в результате чего могут стимулироваться процессы перераспределения атомов кислорода, что и приведет к изменению характеристик ВТСП [7,16]. Для полноценного комментария полученных результатов требуется дальнейшая работа.

### Заключение

Таким образом, в образцах Y123, длительное время после синтезирования хранившихся в комнатных условиях, изучено воздействие внешних магнитных полей на ширину его сверхпроводящего перехода, критической температуры и магнитосопротивления. Выяснилось, что увеличение магнитного поля привело как к увеличению, так и к уменьшению ширины перехода. Наблюдается также аномальный рост критической температуры, а магнитосопротивление проявило сильную зависимость от температуры. Наблюдаемые результаты объясняются в границах модели неоднородного распределения структурных дефектов, присутствующих в образцах на микроскопическом уровне. Полученные результаты позволяют составить представление об эволюции механизма сверхпроводимости в состарившихся образцах, а также способствуют разработке технологии получения образцов со стабильными и высокими характеристиками в магнитных полях.

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**EXPRESS ANALYSIS OF UNKNOWN ORGANIC SUBSTANCES****SUREN GHARAJYAN**

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**Abstract**

Conducting chemical experiments and analyzing them take up most of the time from all the work of scientists. Any chemist can mix and dissolve reagents, but for some research and experiments, you need to repeat the same manipulations hundreds of times while maintaining the accuracy of the proportions of the reagents. Besides, a considerable amount of effort is spent combining reagents with each other and fixing the results obtained. All these processes are similar in that they require repeating the same actions with a slight difference in the variables.

Of course, modern instrumental methods of chemical analysis come to the rescue. They are highly accurate, based on the latest principles of contemporary science, and often require modern equipment and highly specialized service personnel. The work of the laboratory staff is based on the analysis of the received samples of raw materials and products. At the same time, working in a chemical laboratory can be dangerous, and specific standards and requirements for equipment and reagent storage have been developed to protect the personnel.

Therefore, to achieve the best results, it is necessary to make substantial financial and labour intensive investments in chemical laboratories. This is fully justified in a number of forensic and innovative research laboratories, where each study is unique and often has several legal implications.

However, a large number of chemical laboratories carry out routine work daily. A fully equipped chemical laboratory allows you to study the properties of individual substances and materials, to observe the course of the interaction of reagents. The main goal of the employees of chemical laboratories is to create and implement express



methods for the analysis of samples, which allow for quality control in the "field" conditions. Work is constantly underway to speed up the preparation of samples for research, and screening methods of analysis are being introduced. These laboratories need daily rapid tests that can be performed quickly and inexpensively. Using relatively inexpensive chemical reagents, the simplest physicochemical, color, and other tests presented in the article, the laboratory will quickly and efficiently complete its daily task while avoiding expensive equipment.

We hope that this work will be helpful, especially for environmental and chemical laboratories with limited resources and factory and various industrial laboratories, because as a result, both material resources and, most importantly, time are saved.

### **Keywords and phrases**

Organic compounds, solvent, solubility, aliphatic and aromatic hydrocarbons, alcohols, aldehydes, ketones.

## **ԱՆՀԱՅՏ ԾԱԳՄԱՆ ՕՐԳԱՆԱԿԱՆ ՆՅՈՒԹԵՐԻ ԷՔՍՊԵՐՏ ՎԵՏԱԶՈՏՈՒԹՅՈՒՆ**

### **ՍՈՒՐԵՆ ՂԱՐԱԶՅԱՆ**

մագիստրանտ

Հայաստանի ազգային պոլիտեխնիկական համալսարանի լեռնամետալուրգիական  
և քիմիական տեխնոլոգիաների ընդհանուր քիմիայի և քիմիական  
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### **ՆԵՒԵՆ ԿՈՎՈՒՆՆԻՍՅԱՆ**

դոցենտ

Հայաստանի ազգային պոլիտեխնիկական համալսարանի լեռնամետալուրգիական  
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### **Համառոտագիր**

Քիմիական հետազոտությունների անցկացումը և դրանց վերլուծությունները զբաղեցնում են գիտնականների ողջ աշխատանքի և ժամանակի մեծ մասը: Իրականում յուրաքանչյուր քիմիկոս կարող է լուծել և խառնել ռեակտիվները, բայց որոշ հետազոտությունների և փորձերի համար հարկավոր է հարյուրավոր անգամ կրկնել նույն մանիպուլյացիաները՝ պահպանելով ռեակտիվների համամասնությունների ճշգրտությունը: Բացի այդ, հսկայական ջանքեր են ծախսվում

ռեագենտները միմյանց հետ համատեղելու և ստացված արդյունքները գրանցելու վրա: Այս բոլոր գործընթացները խիստ միանման են և պահանջում են կրկնել միևնույն գործողությունները փոփոխականների փոքր տարբերությամբ:

Իհարկե, օգնության են հասնում քիմիական վերլուծության ժամանակակից գործիքային մեթոդները, որոնք օժտված են բարձր ճշգրտությամբ, հիմնված են արդի գիտության նորագույն սկզբունքների վրա, միևնույն ժամանակ պահանջում են ժամանակակից, թանկարժեք սարքավորումների և բարձր մասնագիտացված սպասարկող անձնակազմի առկայություն: Ուստի լավագույն արդյունքի հասնելու համար անհրաժեշտ է հսկայական ֆինանսական և աշխատատար ներդրումներ կատարել քիմիական լաբորատորիաներում: Դա լիովին արդարացված է որոշ դատաբժշկական, դատաքիմիական և այլ հատուկ լաբորատորիաներում, ինչպես նաև նորարարական հետազոտական լաբորատորիաներում, որտեղ յուրաքանչյուր ուսումնասիրություն եզակի է և հաճախ ունի մի շարք իրավական հետևանքներ: Այնուամենայնիվ, մեծ թվով քիմիական լաբորատորիաներ ամեն օր իրականացնում են սովորական, կրկնվող աշխատանք: Այս լաբորատորիաներին անհրաժեշտ են ամենօրյա արագ փորձարկումներ, որոնք հնարավոր է կատարել արագ, արժանահավատ և առանց էական ծախսերի: Օգտագործելով հողվածում ներկայացված պարզ ֆիզիկաքիմիական, գունային և այլ թեստերը, ինչպես նաև համեմատաբար էժան քիմիական ռեակտիվներ՝ լաբորատորիան շատ արագ և արդյունավետորեն կարող է իրականացնել իր ամենօրյա խնդիրները՝ միևնույն ժամանակ խուսափելով թանկարժեք սարքավորումների օգտագործումից: Հուսով ենք, որ այս աշխատանքը օգտակար կլինի հատկապես սահմանափակ ռեսուրսներ ունեցող բնապահպանական և քիմիական լաբորատորիաների, ինչպես նաև գործարանային և արդյունաբերական տարբեր լաբորատորիաների համար, քանի որ արդյունքում խնայվում են և՛ նյութական ռեսուրսները, և՛, որ ամենակարևորն է, ժամանակը:

### **Բանալի բառեր և բառակապակցություններ**

Օրգանական միացություններ, լուծիչ, ալիֆատիկ և արոմատիկ ածխաջրածիններ, սպիրտեր, բարձրամոլեկուլային ալդեհիդներ, կետոններ:

## ЭКСПРЕСС-АНАЛИЗ НЕИЗВЕСТНЫХ ОРГАНИЧЕСКИХ ВЕЩЕСТВ

**СУРЕН КАРАДЖЯН**

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### **Аннотация**

Проведение химических экспериментов и их анализ занимают у ученых большую часть времени от всей работы. Смешивать и растворять реагенты может любой химик, но для некоторых исследований и экспериментов нужно сотни раз повторить одни и те же манипуляции, при этом сохранив точность пропорций реагентов. К тому же огромное количество сил уходит на сочетание реагентов между собой и фиксацию полученных результатов. Все эти процессы схожи в том, что они требуют повторения одних и тех же действий с небольшой разницей переменных.

Конечно, приходят на помощь современные инструментальные методы химического анализа. Они обладают высокой точностью, основаны на новейших принципах современной науки, при этом часто предполагают наличие современного оборудования и высокоспециализированного обслуживающего персонала. Работа персонала лаборатории строится на анализе полученных проб сырья, продукции и материалов. В то же время работа в химической лаборатории может быть опасна, и для защиты персонала разработаны определённые стандарты и требования к оборудованию и хранению реагентов.

Поэтому для достижения наилучших результатов необходимо делать огромные финансовые и трудоемкие вложения в химические лаборатории. Это полностью оправдано в ряде судебно-медицинских лабораторий, а также в инновационных научно-исследовательских лабораториях, где каждое исследование уникально и часто имеет ряд юридических последствий.

Однако большое количество химических лабораторий ежедневно выполняют рутинную работу. Полноценно оборудованная химическая лаборатория позволяет

исследовать свойства отдельных веществ и материалов, наблюдать за ходом взаимодействия реагентов. Основная цель сотрудников химических лабораторий – создание и внедрение экспресс-методов анализа образцов, позволяющих проводить контроль качества в «полевых» условиях, ведутся работы по ускорению подготовки образцов к исследованию, внедряются скрининговые методы анализа. Такие лаборатории нуждаются в ежедневных быстрых тестах, которые будут выполняться быстро и без особых затрат. Используя относительно недорогие химические реактивы, простейшие физико-химические, цветовые и другие тесты, представленные в статье, лаборатория очень быстро и качественно выполнит свою повседневную задачу, при этом избегая использования дорогостоящего оборудования.

Надеемся, что данная работа будет полезной, особенно для экологических и химических лабораторий с ограниченными ресурсами, а также для заводских и разных производственных лабораторий, потому что в результате экономятся как материальные ресурсы, так и самое главное – время.

### **Ключевые слова и фразы**

Органические соединения, растворитель, алифатические и ароматические углеводороды, спирты, высокомолекулярные альдегиды, кетоны.

## **Introduction**

The basis of express analysis of unknown organic substances is qualitative reactions - these are reactions that make it possible to prove the presence of a particular substance (ion) in a medium or the presence of a functional group in a substance.

Analyzed substances can be in various states of aggregation (solid, liquid and gaseous). Based on the observed effects, all reactions can be divided into several groups: formation of characteristic precipitation, dissolution of a substance, appearance (change) of colour, the evolution of gases, change in smell, coloring the flame.

This work presents the qualitative reactions used in analytical chemistry, with the help of which the elemental and functional analysis of organic compounds is carried out, i.e., what elements and functional groups are included in the organic compound.

In addition, the basic concepts of identification are considered in detail: sensitivity, selectivity and specificity of analytical reactions; methods of fractional and systematic analyzes are described. Particular attention is paid to the choice of analytical reactions and methods of their implementation, and the requirements for qualitative reactions.

## **Theoretical - methodological bases**

Preliminary research (characteristics of appearance) can often greatly simplify further work, although, in itself, it does not always lead to a complete solution to the problem posed. Preliminary research begins with a description of the external properties of the substance.

The most important stage of the theoretical and methodological bases of express analyses of unknowns, including organic substances, are chemical colour reactions - a change in the colour of a substance on various macro- and microscopic structures of the samples under certain circumstances chemical reagents. This chemical research method is used in the identification of samples of substances to distinguish between different functional groups. A taxonomic trait can be either a positive or negative test result and variations in the color change in positive reactions, since the same reagent can give different staining for different functional groups.

Also, the determination of the solubility of a substance in water and various non-aqueous solvents will help draw a conclusion about which class of organic compounds refers to this substance.

It is also necessary to test the stability of the test substance when heated. In this case, all observed changes in the substance should be noted: melting, sublimation, colour change, odour release or decomposition. If the substance is flammable, it may be helpful to record the colour of the flame.

Identifying substances by the nature of their smell requires a certain amount of experience and skill. For example, the smell of simple monohydric phenols, lower aliphatic alcohols, ketones and aldehydes, lower fatty acids of aromatic mononitro derivatives is usually quite characteristic and can give a clue to their identification.

## **Research methods**

When the test object is burned on the flame of an alcohol burner, a characteristic smoky flame is observed during the combustion of high molecular weight aromatic hydrocarbons. At the same time, when burning simple hydrocarbons, the smell of burnt sugar is felt. If the object burns without residue, it means that it does not contain metal ions in its composition.

The solubility (level of solubility) of the test object in the water and other (organic) solvents makes it possible to determine to which class (group) of organic compounds it belongs. Depending on the difference in the solubility of an object in the water and ether, organic compounds can be divided into four classes:

- a) soluble in water and ether:

lower aliphatic alcohols, aldehydes and ketones, low and medium carboxylic acids, aliphatic amines, polyhydric phenols, aminophenols;

b) insoluble in water and ether:

aliphatic and aromatic hydrocarbons, high amines, sulfamides, sulfanilic acid;

c) soluble in water, insoluble in ether:

polyhydric alcohols, polybasic acids, carboxylic acids, aliphatic amino acids, sulfates, salts, carbohydrates.

d) insoluble in water, soluble in ether:

Hydrocarbons, alcohols (C5 and more), high molecular weight aldehydes, ketones, higher (over 10 atoms - palmitic, stearic, oleic) and medium (4-9 atoms - citric) carboxylic acids, acid anhydrides, halogenated hydrocarbons, ethers and esters, phenols, higher amines, nitro compounds.

The solubility of the object in 55% solutions of NaOH and NaHCO<sub>3</sub> is also investigated:

1) Carboxylic acids and some acidic phenols (nitrophenols) dissolve in these two solvents. In addition, in the presence of carbonic acid in the composition of the test object, when dissolved in a dilute solution of sodium bicarbonate, the release of CO<sub>2</sub> is observed;

2) Phenols, primary and tertiary aliphatic nitro compounds dissolve only in NaOH solution;

3) Alcohols do not interact with alkalis; therefore, water-insoluble alcohols are also insoluble in alkalis.

When the test object is heated in a 10-20% NaOH solution, a yellow colouration is observed in aldehydes, alcohols, reducible sugars, and in the presence of polyhydric phenols, a brown-black colouration is observed.

## Obtained results

Identification of functional groups.

Determining functional groups in the composition of the investigated object allows you to determine which class of organic compounds it belongs to. For this, a functional analysis is carried out, i.e., determining atomic (functional) groups with a certain reactivity.

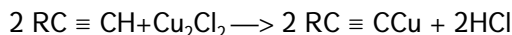
Saturated hydrocarbons can be distinguished from other organic compounds by their low reactivity with most reagents used in the laboratory. Their identification is carried out mainly by determining the physical constants (melting point, boiling point, refractive index).

Unsaturated hydrocarbons or hydrocarbons of the ethylene series are identified by the detection of the  $C = C$  double bond in the following ways:

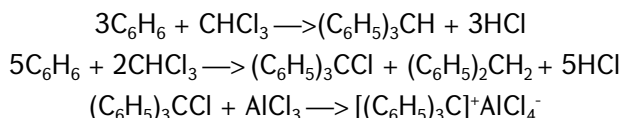
1. The reaction of the addition of bromine. Compounds with a double bond combine with bromine. If double bonds are present in the test object, then the reaction leads to discolouration of bromine;

2. Reaction with potassium permanganate (Wagner reaction). For a qualitative determination of the presence of a double bond, potassium permanganate is added to the test object. The disappearance of the purple hue (fuchsia colour) and the simultaneous formation of a cotton-like precipitate ( $MnO_2$ ) indicate the presence of a double bond.

Unsaturated hydrocarbons of the acetylene series are identified by triple bond detection. The identification of these substances as unsaturated compounds is carried out in the same way as ethylene hydrocarbons. However, unlike hydrocarbons of the ethylene series, the hydrogen atom of acetylene and its derivatives can be easily replaced with metal ions to form acetylides with a characteristic colour.



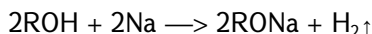
To detect aromatic hydrocarbons, the test object is alkylated with chloroform in the presence of aluminium chloride. In addition to the target product, complex salts of a typical colour are formed.



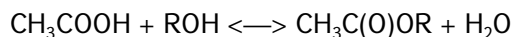
In the object of research, hydrogen halides are detected by the formation of copper halides, which colour the flame of an alcohol burner green or bluish-green. It should be remembered that nitrogen-containing compounds in the absence of halides also give such a picture.

To detect compounds containing a hydroxyl group (OH) (aliphatic alcohols, phenols, naphthols, etc.), we carried out the following:

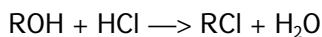
1. the interaction of the object under study with metallic sodium, as a result of which, in the presence of alcohols and phenols, sodium alcoholates and sodium phenates are formed, and hydrogen is released.



2. the interaction of the test object with glacial acetic acid (ice vinegar) in the presence of sulfuric acid. As a result, an ester is formed; when diluted with water, it passes into the upper layer of the mixture.

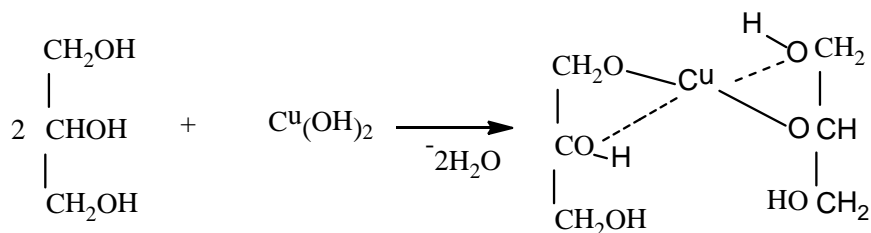


3. to determine primary, secondary and tertiary alcohols, Lucas's reagent (anhydrous  $\text{ZnCl}_2$  in concentrated hydrochloric acid) is added to the test object. As a result, water-insoluble chloroalkanes are formed.

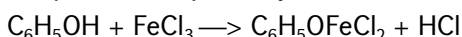


Depending on the structure of the alcohol, the reaction proceeds at different rates. Tertiary alcohols react at a high rate to form insoluble chloroalkanes. Primary alcohols interact only under heating conditions; secondary alcohols occupy an intermediate position.

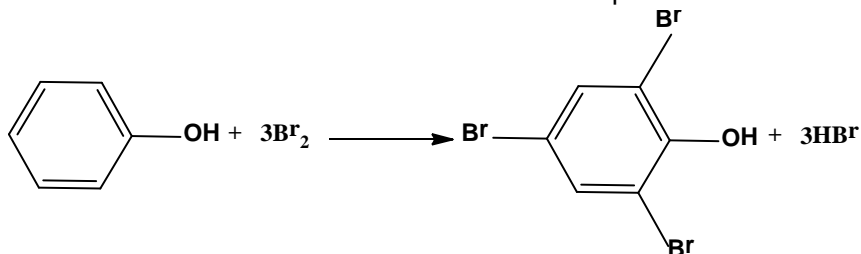
4. Detection of polyhydric alcohols is carried out with copper (II) hydroxide due to the interaction of freshly prepared copper (II) hydroxide with polybasic alcohols, white complex salts with a bluish tint are formed.



To determine the presence of phenols, iron (III) chloride is added to the test object, as a result of which intensely colored complex salts are formed. In the presence of monohydric phenols, violet colour is usually observed. In the case of diatomic phenols, green, black, violet and yellow colours are observed, characteristic of pyrocatechol, resorcinol, hydroquinone, respectively.

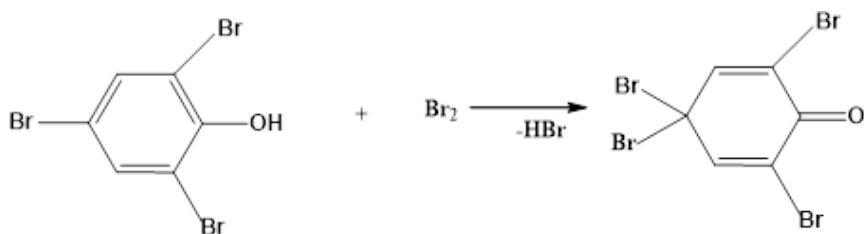


In order to identify phenols, the test object is treated with "bromine water", the disappearance of bromine colouration is the result of the replacement of bromine.

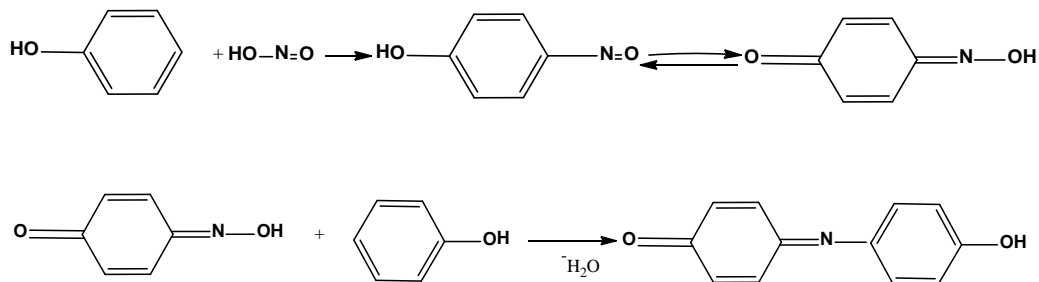


In the case of an excess of "bromine water", the resulting tribromophenol is oxidized to 2,4,4,6-Tetrabromocyclohexa-2,5-dienone ( $\text{C}_6\text{H}_2\text{Br}_4\text{O}$ ), which has a yellow colour.





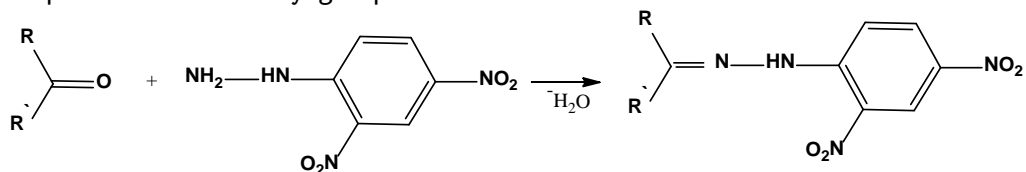
Most phenols that do not contain substituents in the para-positions react with nitric acid to form nitrophenols. In the presence of concentrated sulfuric acid, they condense with excess phenol, resulting in pinkish reaction products.



For the qualitative determination of naphthols in a test object of unknown origin, an interaction with iron (III) chloride in the presence of ethanol is carried out. If  $\alpha$ -naphthols are present in the test object, the mixture turns purple with dark purple flakes. In the presence of  $\beta$ -naphthols, a yellowish-green colour is observed, followed by the formation of a white precipitate.

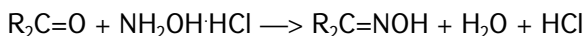
The detection of carboxylic acids is based on their ability to replace and combine. Aldehydes and ketones appear in almost the same way, in some cases as a result of reactions at different rates.

To detect and quantify aldehydes and ketones, a reaction with 2,4-dinitrophenylhydrazine is used. The formation of a yellowish or red precipitate indicates the presence of a carbonyl group.



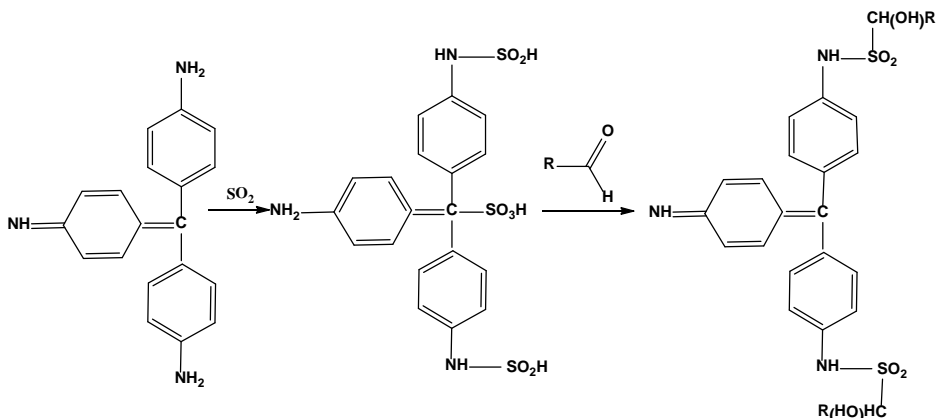
R, R' = H, alkyl, aryl groups

As a result of the interaction of carbonyl compounds with hydroxylamine hydrochloride, oxime is formed, and HCl is released.



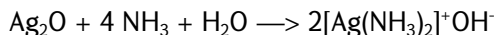
The change in the acid-base environment can be determined by the change in the colour of the methyl orange indicator.

Only aldehydes are characterized by the interaction of the test object with Schiff's reagent (aqueous solution of fuchsin sulfuric acid). In the presence of aldehydes, grey colour is observed.



Aldehydes are strong reducing agents that reduce trivalent copper to bivalent copper and oxidize them to the corresponding carboxylic acids. Fehling's reagent ( $\text{CuH}_2\text{O}_4\text{S}$ ) is used as a reagent containing the  $\text{Cu}^{2+}$  ion. In the presence of aldehydes, a brick-red precipitate ( $\text{Cu}_2\text{O}$ ) is formed.

All aldehydes reduce the ammonia-water solution of silver oxide. In the case of an excess of an ammonia-water solution,  $\text{Ag}_2\text{O}$  goes into solution in the form of an ammonia complex.

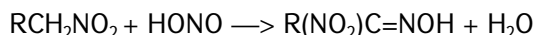


Aldehydes are easily oxidized and reduce silver complex compounds to metallic silver. The following reaction occurs:

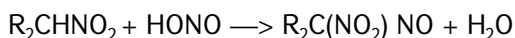


Qualitative reactions of nitro compounds are based on the ability of primary, secondary, tertiary nitro compounds to react with nitrous acid or on the ability to form aci-forms of primary and secondary nitro compounds (nitronic acids).

Primary nitro compounds with nitrous acid give a blood-red colour. The following reaction occurs:

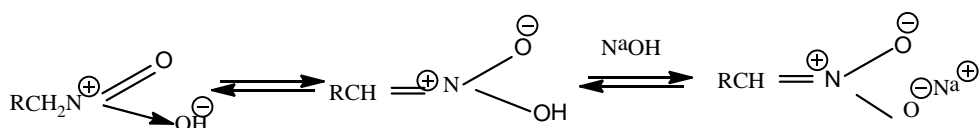


Secondary nitro compounds with nitrous acid give a bluish tint. The following reaction occurs:



Tertiary nitro compounds do not interact with nitrous acid.

Primary and secondary aliphatic nitro compounds interact with concentrated sodium hydroxide solution to form aci-forms of nitro compounds of sodium salts.



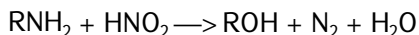
The interaction of the obtained compounds with ferric chloride leads to a reddish or brownish-red colour.

For the qualitative determination of nitro compounds, a few drops of a solution of diphenylamine in sulfuric acid are added to the test samples. If the solution turns blue, it may contain nitrate and/or nitrite ions.

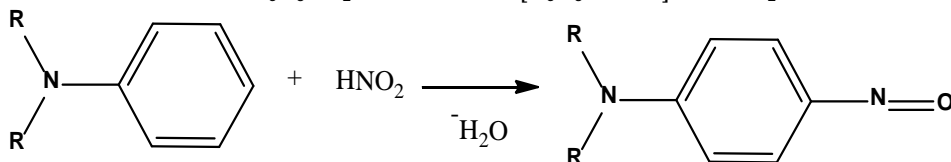
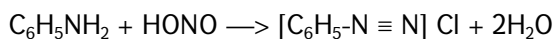
To detect aromatic nitro compounds, the test object interacts with a certain amount of phenol, water, and potassium hydroxide. The appearance of a brownish-red hue indicates the presence of aromatic nitro compounds.

Amines, as bases, show an alkaline reaction on a litmus test. Primary, secondary and tertiary amines show different reactivity with nitrous acid.

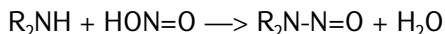
When primary aliphatic amines react with nitrous acid, nitrogen is released.



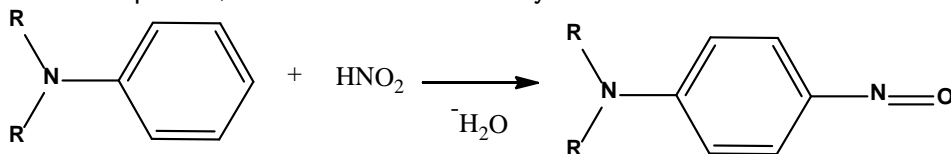
Primary aromatic amines react with nitrous acid to form diazonium salts, which combine with  $\beta$ -naphthols in solution. The formation of an orange or orange-red hue indicates the presence of primary aromatic amines.



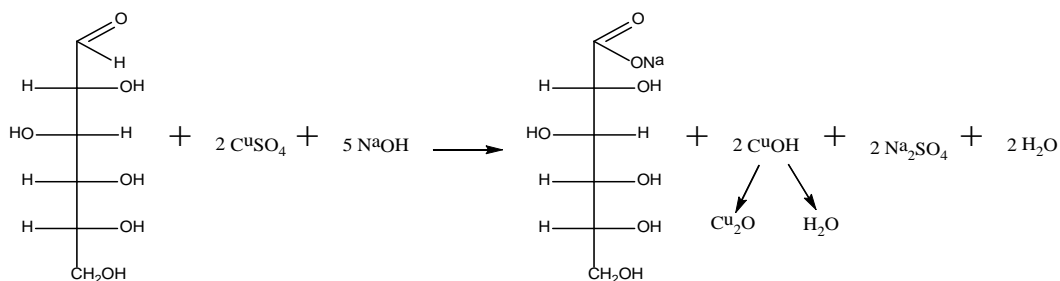
Secondary aliphatic and aromatic amines with nitrous acid form nitrosamine as a dark oil.



Tertiary fatty-aromatic amines with the addition of nitrous acid form C-nitroso compounds, which colour the solution yellow-brown.



To determine carbohydrates, aqueous solutions of sodium hydroxide (NaOH) and copper sulfate ( $\text{CuSO}_4$ ) are added to the test samples. These mixtures are heated to a boiling point; as a result in the presence of carbohydrates, a yellow precipitate of copper hydroxide ( $\text{CuOH}$ ) is formed. Upon further heating of the solution, a red precipitate of copper oxide ( $\text{Cu}_2\text{O}$ ) is formed.



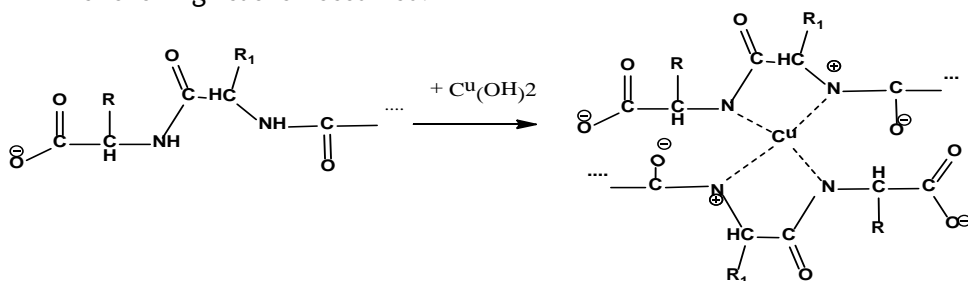
The qualitative determination of fructose is based on Seliwanoff's test. When fructose (and other ketosis) is heated with hydrochloric acid, oxymethylfurfural is formed (the reaction lasts 30-60 seconds). Oxymethylfurfural with resorcinol forms a reddish compound as a result of condensation.

To determine glucose, the sample is heated in a solution of acetic acid with o-toluidine. The green colour of the solution indicates the presence of glucose. The intensity of the colour is proportional to the glucose content. The latter is determined in a liquid form in which proteins have previously been removed.

A few drops of 1% iodine solution are added to a certain amount of the test sample to determine starch. The formation of an intense blue colour indicates the presence of starch in the test sample.

To determine the presence of proteins, the test sample is treated with a 5% aqueous solution of sodium hydroxide (NaOH) and then a few drops of a 10% solution of copper sulfate. As a result, in the mixture, in the presence of proteins, a violet hue is observed - this is the formation of a complex between copper (II) hydroxide  $\text{Cu}(\text{OH})_2$  and protein molecules.

The following reaction occurred:



A few drops of the test sample are dropped onto filter paper to determine the presence of fat, and a characteristic trace is observed. When the filter paper is heated on a heater, the trace does not disappear in the presence of fat. Fats do not dissolve in water, they dissolve well in benzene, chloroform, acetone, and partially in alcohols.

For a qualitative determination, fat emulsification is performed. Mixtures of the test samples are prepared in test tubes, respectively, with distilled water, 2% aqueous

solution of sodium carbonate, 2% aqueous solution of soap. The tubes were shaken vigorously. In the presence of fats, the first solution forms an unstable emulsion in water, and in the remaining test tubes a stable emulsion is observed due to emulsifiers, which are adsorbed on the fat droplets, giving them the same charge, reducing the surface tension.

### **Conclusions**

In addition to the research methods listed above, the samples submitted for research can be examined by other scientifically grounded instrumental methods, which, however, involve the use of expensive equipment. However, the described methods are very reliable, inexpensive, fast, applicable in open areas or in any other conditions, and thus, they turn chemical science into a true friend and helper of other specialists.

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 21.04.2021թ.:

## SOCIO-PSYCHOLOGICAL CHARACTERISTICS OF GROUP RELIABILITY OF PHYSICIANS IN EMERGENCIES COVID-19 PANDEMIC

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### **Abstract**

This article presents the scientific hypothesis that the socio-psychological profile of group reliability of physicians in emergencies is formed mainly by active professional-personal qualities of group members, such as sincerity, personal responsibility and awareness and work efficiency. To prove the presented hypothesis, we studied the peculiarities of demonstrating the group reliability of physicians and the features forming the concept of their group reliability – a comparative empirical analysis of the medical support group's reliability criteria was conducted.

The practical value of the research presented in this article lies in the fact that the ideas about group reliability gained during empirical-theoretical research are a methodological basis for developing social-psychological programs and training aimed at increasing the effectiveness of physicians' activities. This may be done by bettering group cohesion, improving the staff's communicative qualities, and harmoniously developing human resources.

This research also reveals an essential aspect of professional reliability that relates to the psychological effects of teamwork while working in a group, which tends to reduce team stress and aid in personal job functions. In this regard, let's note such aspects as:

- Psychological features of persons engaged in joint professional activities.
- Mechanisms of organizing work in a single psychological field take into account the different professional functions and individual characteristics of employees.

## **Keywords and phrases**

Group reliability, sincerity, personal responsibility, awareness, work efficiency, emergencies.

## **ԲԺԻՇԿՆԵՐԻ ՀՈՒՍԱԼԻՈՒԹՅԱՆ ՍՈՑԻԱԼ-ՀՈԳԵՔԱՆԱԿԱՆ ԲՆՈՒԹԱԳՐԱԿԱՆԸ COVID-19 ՀԱՄԱՎԱՐԱԿԻ ԱՐՏԱԿԱՐԳ ԻՐԱՎԻՃԱԿՈՒՄ**

### **ՆԱԻՐԱ ՀԱԿՈԲՅԱՆ**

ՀՀ ԳԱԱ ԳԿՄԿ գիտահետազոտական աշխատանքների գծով փոխտնօրեն  
հոգեբանական գիտությունների դոկտոր, պրոֆեսոր  
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### **ԱՆՆԱ ԽԱՉԱՏՐՅԱՆ**

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ՀՀ ԳԱԱ ԳԿՄԿ  
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## **Համառոտագիր**

Այս հոդվածը ներկայացնում է գիտական վարկածն առ այն, որ COVID-19 համավարակի արտակարգ իրավիճակի պայմաններում բժիշկների խմբում հուսալիության սոցիալ-հոգեբանական պրոֆիլը ձևավորվում է հիմնականում խմբի անդամների ակտիվ մասնագիտական և անձնային հատկությունների՝ անկեղծության, պատասխանատվության, տեղեկացվածության և աշխատանքի արդյունավետության միջոցով: Ներկայացված վարկածը հաստատելու համար մենք ուսումնասիրել ենք բժիշկների խմբի հուսալիության դրսևորման առանձնահատկությունները: Բժշկական աջակցության խմբում իրականացվել է հուսալիության չափանիշների համեմատական էմպիրիկ վերլուծություն:

Սույն հոդվածում ներկայացված հետազոտության գործնական արժեքը նրանում է, որ էմպիրիկ-տեսական հետազոտության ընթացքում խմբերի հուսալիության վերաբերյալ բացահայտված գաղափարները հանդիսանում են արդյունավետության բարձրացմանն ուղղված սոցիալ-հոգեբանական ծրագրերի և դասընթացների մշակման մեթոդաբանական հիմքը: Դրան կարելի է հասնել խմբի համախմբվածության բարելավման, անձնակազմի հաղորդակցական հմտությունների կատարելագործման և մարդկային ռեսուրսների ներդաշնակ զարգացման միջոցով:

Այս հետազոտությունը բացահայտում է նաև մասնագիտական հուսալիության կարևոր կողմ՝ կապված թիմային աշխատանքի հոգեբանական արդյունավետության հետ, որն իր հերթին նվազեցնում է թիմում լարվածությունը և նպաստում է



աշխատանքային գործառույթների իրականացմանը: Այս կապակցությամբ նշվում են այնպիսի ասպեկտներ, ինչպիսիք են՝

- համատեղ մասնագիտական գործունեությամբ զբաղվող անձանց հոգեբանական առանձնահատկությունները,

- Աշխատանքի կազմակերպման մեխանիզմները՝ հաշվի առնելով աշխատակիցների տարբեր մասնագիտական գործառույթները և անհատական առանձնահատկությունները:

### **Բանալի բառեր և բառակապակցություններ**

Խմբային հոսալիություն, անկեղծություն, պատասխանատվություն, տեղեկացվածություն, աշխատանքի արդյունավետություն, արտակարգ իրավիճակներ:

## **СОЦИАЛЬНО-ПСИХОЛОГИЧЕСКИЕ ХАРАКТЕРИСТИКИ ГРУППОВОЙ НАДЕЖНОСТИ ВРАЧЕЙ В ЧРЕЗВЫЧАЙНОЙ СИТУАЦИИ ПАНДЕМИИ COVID-19**

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### **Аннотация**

В статье представлена научная гипотеза о том, что социально-психологический профиль групповой надежности врачей в условиях чрезвычайной ситуации пандемии COVID-19 формируется, в основном, активными профессионально-личностными качествами членов группы, такими как искренность, личная ответственность, осведомленность и эффективность работы. Для подтверждения представленной гипотезы были изучены особенности демонстрации групповой надежности врачей - проведен сравнительный эмпирический анализ критериев надежности группы медицинского персонала.

Практическая ценность исследования, представленного в данной статье, заключается в том, что представления о групповой надежности, полученные в ходе

теоретико-эмпирического исследования, являются методологической базой для разработки социально-психологических программ и тренингов, направленных на повышение эффективности деятельности врачей. Это может быть достигнуто за счет улучшения показателей сплоченности группы, улучшения коммуникативных качеств персонала и гармоничного развития человеческих ресурсов.

Это исследование также выявляет важный аспект профессиональной надежности, связанный с психологической эффективностью командной работы, что, в свою очередь, снижает командное напряжение и помогает выполнять рабочие функции. В этой связи отметим такие аспекты, как:

- психологические особенности лиц, занимающихся совместной профессиональной деятельностью;
- механизмы организации работы в едином психологическом поле, учитывающие разные профессиональные функции и индивидуальные особенности сотрудников.

#### **Ключевые слова и фразы:**

Групповая надежность, искренность, ответственность, осведомленность, эффективность работы, чрезвычайные ситуации

### **Introduction**

Professional or work reliability is understood by some authors as a person's inherent readiness to avoid mistakes during work, a person being ready to perform a certain job or certain operative functions by displaying appropriate behaviour aimed not only at meeting his individual needs but also the needs of the whole group. Often, a person's job reliability is described as an indicator of their uninterrupted performance over a period of time, which becomes the demonstration of the entire team's efficiency during the work.

According to E.A. Milleryan (Milleryan, 1974), special attention should be given to their abilities and skills that continue to function smoothly even in emergencies when describing the employee's reliability. In doing so, according to the author, it is possible to describe best the operational standards that continue to be relevant in extreme conditions. These standards go on to be considered the most reliable and necessary. Many other authors (Chortok, Hakobyan, Khachatryan & Starchenko, 2019; Zavalova, 1971) understand "reliability" as the ability of a person to maintain working qualities in the face of difficult working conditions also show a similar position on the issue.

It should be noted that modern psychological studies of reliability take the theoretical-methodological emphasis to a new level. Thus, some authors (Everdij &

Blom, 2006; Flyer, 1965; Hollnagel, 1989) point out that today the analysis of professional reliability in the field of nuclear energy needs to be moved to a methodically new level to include the term "safety culture" in the whole system of reliability training.

This means that reliability has begun being seen as a measure of a person's potential reserves and their effectiveness – as a measure of certain personal qualities. That is why, for several authors, reliability is primarily interpreted as an indicator of a person's work efficiency in an emergency or unusual situations.

As we can see, the term personal reliability mainly relates to the psychological aspects of professional productivity in various areas of work. In general, the concept of personal reliability particularly reveals the qualitative features of an individual activity only indirectly related to group reliability. According to some researchers (Altman, 1996; Flinn, Flyer & Holdrege, 1963; Gertman, 2004; Wiskoff, 1987), reliability is a strong trait of a person, which characterizes him by the predictability of behaviour in the work process, compliance with social norms, social standards necessary for the implementation and development of social relations in society. Therefore, the psychological description of reliability is used in a special cognitive-behavioural way.

According to the experts in the field, professional reliability is characterized by infallibility, excellence, the ability to act promptly, which is aimed at the strategy to achieve the goal during a certain interaction. Professional reliability is essentially the sum of functional properties in the workplace that provide the quality needed to ensure dynamic stability in the performance of work responsibilities. Thus, a systemic feature of reliability can be considered the diligence of employees, ensuring inclusion in work activities.

The group factor of reliability is a combination of professional, psychological, physiological, anthropological and social features typical for the entire or predominant staff.

Examining the issue of reliability in military psychology (Crook, 2011), the author singled out the factor of personal reliability in the professional activity of the personnel. From this point of view, the author singles out the features of the behaviour following the rules of ethics, which are most in line with the goals of maintaining and developing the professional-working indicators of the personnel. Only in this case, the appropriate solution to work problems is possible.

We see the same conclusion in the research by I. Altman, a psychologist at the School of Marine Medicine (University of Utah) since the mid-1960s. It relates to behaviour of male groups isolated from their families and private life. H. Abrams, in turn, considered that the main task of development of professional-working functions is to study the problems of staff reliability to increase the level of reliability. Abrams

suggested that certain measures be taken to achieve a higher level of staff reliability, measures to improve the staff monitoring system: medical examinations, personal interviews with candidates, completion of standardized tests, control of alcohol and drug abuse, and so on (Abrams, 1987; Altman, 1996).

### **Methodological bases**

From a methodological point of view, the study of group reliability by Hollnagel proposed several evaluation criteria to identify group organization, based on the system-functional approach (Hollnagel, 1993). He set the following criteria to assess the group's reliability:

a) Compatibility, which requires the existence of relatively homogeneous elements within a single social structure, their actual interaction as one of the essential conditions for the existence of that structure;

b) The degree of intensity with which the modernization of functions takes place as a guarantee for the maintenance of a social structure, regardless of the intra-system structure;

c) Neutralization of dysfunctions as a basis for maintaining the balance of the system;

d) Concentration of functions, which reflects the need to coordinate them for achieving the desired result.

Of particular interest in the field of social psychology is the theoretical-methodological study of the group reliability of medical personnel in emergencies or conditions caused by the COVID-19 pandemic. It is noteworthy that this socio-psychological issue has been covered or researched in relatively minimal scopes. Some publications are devoted to the study of socio-psychological consequences of emergency stress (Hakobyan & Khachatryan, 2018; Hakobyan & Khachatryan, 2020a). It is known that some researchers (Kirwan, Kennedy, Taylor-Adams & Lambert, 1997) paid great attention to the social-psychological factors of stress formation. They drew the scientific community's attention to the level of interpersonal relationships, which is a source of stress. As the main cause of distress, the authors mention the stress that arises from the need to share social space with others in the workplace. So, the authors suggest seeing the solution in re-evaluating the overall group goals, thus increasing the level of group reliability.

Reliable groups express a strong social position aimed at the optimal organization of joint activities, flexible equipping of the management process at work according to the new requirements and goals. Thus, in such reliable groups, developed algorithms of

social behaviour appear, which can meet the organizational and socio-psychological needs of the group not only in ordinary but also in extreme conditions.

The next component of group reliability is voluntary group self-regulation. It turns out that in the presence of extreme conditions during joint activities, there is a tendency to mediate voluntary efforts expressed on a personal level with more developed group activities. In other words, certain compensatory mechanisms are introduced, which maintain the efficiency of the activity as well as significantly increase it during the development of joint activities. As a result, the group maintains its organizational structure.

The next important component of reliability is the person's social position on the successful resolution of the situation in conditions of organizational uncertainty (Vicente, 2002). It turns out that one of the most important factors in overcoming extreme conditions is the socio-psychological conviction of the group members that the current uncertain situation can be successfully resolved, in which a reliable internal working style plays a unique role. In many cases, the most challenging moment for people in such situations psychologically ends not when the problem is objectively corrected, but sooner, as soon as a favourable psychological position is formed among the group members – the belief that everything will end well.

Thus, in the sum of the analyses mentioned above, it can be concluded that the socio-psychological problems that arise during joint group activities are more easily overcome when there is an intra-group organization, which becomes an effective anti-stress tool through group reliability criteria.

Being a subject of joint activity, the group can express itself only in the conditions of realization of existing opportunities. Proportional means of organizing the given activity created by the group members act as a guarantor of group reliability in the conditions of joint activity. Moreover, the proportionality of means is reflected in both internal and external conditions of the environment (Adams, 1982; Benedek, Everett & Holstege, 2011).

Therefore, the reliable group stands out with the following characteristics:

- a) Higher efficiency of joint activities;
- b) Group behaviour in the structure of joint activities;
- c) Ability to take joint action, develop and implement a plan aimed at maintaining effective cooperation.

Thus, a reliable group stands out in extreme conditions, such as the professional environment of physicians working during the COVID-19 pandemic, with the ability to centralize functions maintaining modernization, a positive attitude and organizational values, as well as motivation in the field of social improvement. In other words, the ability of a group to function in a tense or extreme environment is manifested in the

characteristics of group reliability, which are characterized by the effectiveness of the group, the interaction of group members, and the coordination of actions Hakobyan & Khachatryan, 2020b).

Thus, as a result of the social-psychological analysis of group reliability in the conditions of the coronavirus, we have come to the following conclusions.

1. To date, there is no common, universally accepted definition of group reliability in the psychological discipline.

The two most common types of definitions are procedural-summative. The procedural point of view is the dynamics of reliability, the idea of developing reliability as a component of joint activities that stand out in different groups. This aggregate view is valid based on the results at the end of the joint operation.

However, studying the idea of group reliability as a social psychological phenomenon, scientists working on the topic have identified a number of components that can be attributed to the criteria that express the essence of the problem. They are personal, organizational, technological, psychophysiological, professional, methodological, and affective components.

2. Diversity of interpretations of the concept of group reliability and their significantly different parameters indicate the insufficient study of the problem in the social-psychological discipline. On the one hand, this fact can harm the results of decisions aimed at the implementation of theoretical-applied research tasks in extreme conditions. On the other hand, the need to study the tense or extreme conditions of joint activity in this light may intensify this study process, as required in many areas.

3. One of the most effective views is the view that reliability is the system for providing the integral quality of the group, which is upgraded in extreme conditions.

Group reliability in terms of content includes:

- 1) Sustainable results, despite changing conditions of joint activity;
- 2) Ability to make immediate decisions on joint activities in extreme conditions;
- 3) Ability to carry out joint activities without error in extreme conditions;
- 4) Psychological stability aimed at neutralizing the negative factors of the environment and the stressful conditions;
- 5) The ability of group members to work in extreme situations.

4. Theoretical analysis of the work on this issue has shown that most studies are characterized by a predominance of a static approach to the problem. This approach assumes that the impact of the extreme conditions on the group's activities can only be exerted to the extent that the members of the group can foresee changes in processes.

5. When considering the issue of reliability, most of the authors study the peculiarities of joint activity, or group behaviour, in extreme conditions, paying attention to the stability of interpersonal relations and related concepts: "stress resistance", "noise

resistance", "resistance". We believe that stability analysis needs to be complemented by a dynamic approach that makes it possible to study intragroup changes and intragroup behaviour in a given situation.

6. The dynamic approach to the problem mentioned above was substantiated by K. Lynn in "The Conflict between Aristotle and Galilean Thoughts in Modern Psychology" and noted by R. Nemov (Nemov, 2002). In the context of this approach, it is not necessary to make abstract observations instead of aiming to study the dynamic side of a specific event, which will not be related to the isolated object but to the processes arising in the given situation.

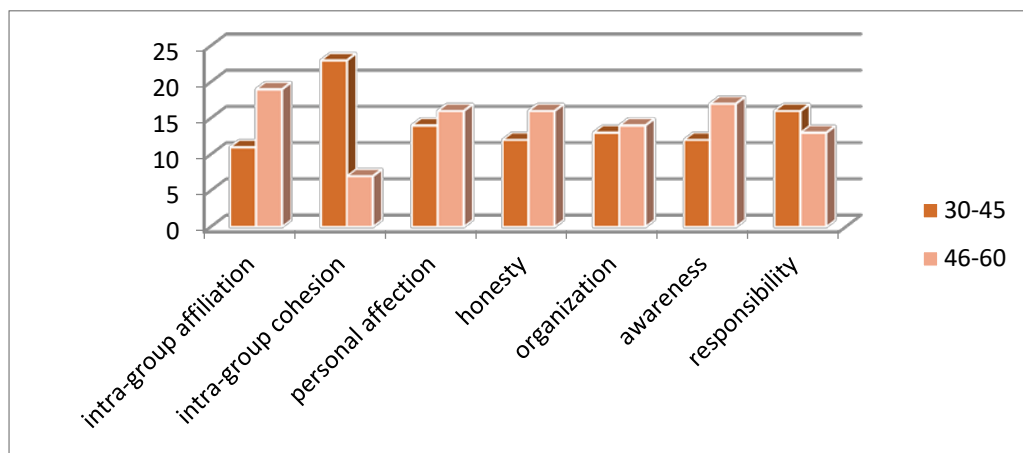
### Research methods

The experimental research was conducted through the following methodological elaborations: R. Nemov's "Social-psychological self-assessment of the team" method, A. Lutoshkin's "Assessment of the team psychological atmosphere" method, V. Khashchenko's "Video-analog" scale (Khashchenko & Juravlev, 1990; Lutoshkin, 1978; Nemov, 2002).

Now let's present the results derived from the first method.

For the medical staff by the age of 30-45, the order of assessments showed the following picture. Except for the intragroup cohesion test, where the average score was higher, all other criteria were approximately the same. The next age group (46-60) showed a higher assessment of intra-group affiliation in relation to the rest of the indicators (Figure 1).

**Figure 1. Social-psychological self-assessment of the team**



The results of the first method by gender are as follows.

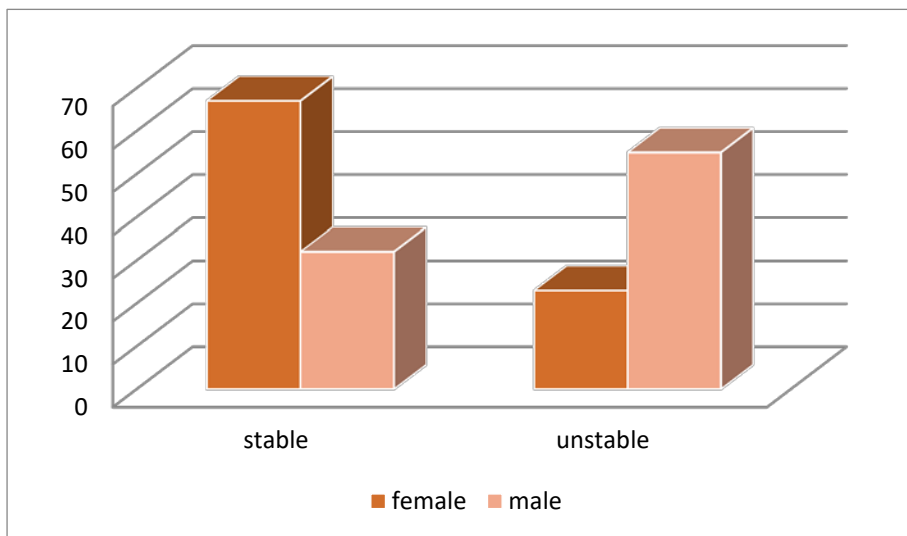
Women showed equal indicators with a slight prevalence of high scores. The only exception was the intragroup cohesion index, with which almost everyone was unhappy and chose the average rating.

For men, the differences were sharper. The indicators of intragroup cohesion were averaged, and the opinions on the indicators of personal intragroup affiliation, organization and responsibility were shared.

From the above, it can be assumed that in the extreme situation caused by COVID-19, in the team group of physicians, such characteristics as organization and responsibility are not perceived as criteria of group reliability but rather as individual traits. However, the desire to maintain group integrity and affiliation was highly valued in all sample groups. Another important factor is that the intragroup cohesion index has emerged as the most sensitive criterion for all. Therefore, this conclusion already suggests that the factor of intragroup cohesion underlying the hypothesis of group reliability is indeed considered an important factor – a criterion worthy of special attention.

The next method, the results of which are presented below, is the method of characterizing the psychological climate, the numerical indicators of which we show as well (Figure 2).

**Figure 2. Description of the psychological climate by gender**



As can be seen from Figure 2, most physicians consider the current psychological climate to be determined by the gender of the respondents. This chart clearly shows that men tend to find the psychological atmosphere of doctors more unstable than women do. As for the age groups, the opinions are almost equal here.

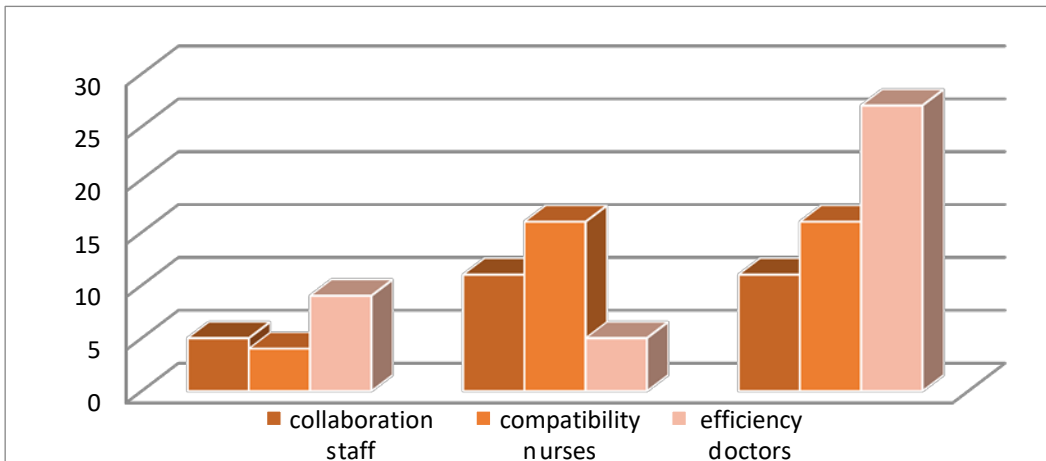


The next method, which was used to examine the group reliability of medical staff, is the "Video-analog" scale. Here the survey was organized according to three criteria:

1. Collaboration.
2. Compatibility
3. Efficiency.

With this scale, the respondents were offered to evaluate the above-mentioned criteria on a 100-point scale based on which they think are more characteristic for the group. The answers were averaged and categorized as low (0-40%), medium (41-70%) and high (71-100%) points (Figure 3).

**Figure 3. Video-analog scale**



As we can see from Figure 3, group reliability is maximized by the efficiency of group work. The compatibility criterion is, on average, equated with group reliability.

As for the individual groups, it should be noted that among female employees, the average scores again exceed all three criteria, and in addition to the compatibility criterion for men, which has an average image, the other two criteria are sharply emphasized in terms of efficiency. In terms of age, efficiency and cohesion prevail in the first age group, while in the second age group, only efficiency is emphasized as a measure of group reliability.

This proves our hypothesis that the conceptual framework of group reliability of physicians in COVID-19 emergencies is shaped not as much by intragroup cohesion and work compatibility criteria as by active professional and personal qualities of group members such as sincerity, individual responsibility and awareness and work efficiency.

## **Obtained results**

The results of theoretical and empirical research brought us to the following main conclusions:

1. The conceptual framework of group reliability of physicians is of particular importance due to the presence of other members of the medical staff representing different professions in the professional group - nurses, service staff and administrative staff. Therefore, when mentioning a professional working group of medical staff, we mean, in addition to doctors, the administrative staff of the treatment organization, the service staff, the nurses, who act as members of the support team.

2. The peculiarity of group reliability of medical staff is that it is often manifested in extreme situations such as the coronavirus pandemic. Hence, the mechanisms and technologies of social training for the development of group reliability of physicians are imperative in improving work efficiency based on the principles of a person's value system and self-control.

## **Conclusion**

In conclusion, the research confirms the scientific hypothesis that the socio-psychological profile of group reliability of medical staff is formed mainly by active professional-personal qualities of group members, such as sincerity, individual responsibility, awareness, and work efficiency, among others.

The practical value of the research lies in the fact that as a result of the socio-psychological analysis of the group reliability of medical staff, specific recommendations can be given to specialists in the field to further increase the level of group reliability, taking into account the need to modernize intragroup cohesion.

The identified features make it possible to purposefully organize social-psychological training sessions, seminars on communication skills and capacity development of medical staff.

The scientific-practical significance of this field is very urgent. The importance of research in the international social context of the spread of the epidemic is to focus on the harmonious development of human resources and the development of methodological tools for the study of the communicative qualities of medical staff.

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## EDUCATION IN THE CONDITIONS OF THE NEW CORONAVIRUS, TRAINING OF FOREIGN LANGUAGES IN THE DAYS OF PANDEMIC

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*They cannot stop me. I will get my education, if it is in the home, school, or anyplace. –*

***Malala Yousafzai***

### **Abstract**

In 2019 the spread of the new coronavirus in the world affected all spheres of life. The education sector suffered greatly as the shift to distance learning caused great psychological difficulties. Besides, the problem of technological equipment and access to the Internet arose. Many people around the world couldn't afford to use their computers or smartphones for distance education. The pandemic, however, was an opportunity to acquire new knowledge. In global lockdowns, people started to look for alternative methods for the teaching and learning process to continue. Thus, online learning became not an option but a necessity; people could acquire new knowledge without leaving home and spending resources.

In the course of our work, we conducted surveys among students, and with the help of research, discovered the effectiveness of teaching foreign languages in the context of a pandemic; we highlighted the role of foreign language knowledge in the modern era and studied the model of distance learning in the Republic of Armenia.

### **Keywords and phrases**

COVID-19 pandemic, online learning, distance learning, foreign language teaching, distance education in Armenia.

**ԿՐԹՈՒԹՅՈՒՆԸ ՆՈՐ ԿՈՐՈՆԱՎԻՐՈՒՍԱՅԻՆ ՀԱՄԱՎԱՐԱԿԻ  
ՊԱՅՄԱՆՆԵՐՈՒՄ, ՕՏԱՐ ԼԵԶՈՒՆԵՐԻ ՈՒՍՈՒՑՈՒՄԸ ՊԱՆԴԵՄԻԱՅԻ  
ՕՐԵՐԻՆ**

**ԳՈՀԱՐ ԳՐԻԳՈՐԱՆ**

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**Համառոտագիր**

2019 թվականին աշխարհում տարածված նոր կորոնավիրուսային համավարակն իր ազդեցությունն ունեցավ կյանքի բոլոր ոլորտների վրա, մեծապես տուժեց կրթական համակարգը, քանի որ անցումը հեռավար կրթության նախ մեծ դժվարություններ առաջ բերեց հոգեբանական առումով: Բացի այդ առաջ եկավ նաև տեխնոլոգիական սարքավորումների ու համացանցի հասանելիության խնդիրը: Ամբողջ աշխարհում քիչ չէր այն մարդկանց թվաքանակը, ովքեր ի վիճակի չէին ունենալու սեփական համակարգիչը կամ սմարթֆոնը՝ կրթությունը հեռավար եղանակով շարունակելու համար: Համավարակը, սակայն, նաև հնարավորություն էր նոր գիտելիքների ձեռքբերման համար: Համաշխարհային “lockdown”-ի պայմաններում մարդիկ առանց տնից դուրս գալու և ռեսուրսներ ծախսելու կարող էին նոր գիտելիքներ ձեռք բերել: Աշխատանքը կատարելիս ուսանողների շրջանում կատարել ենք հարցումներ և հետազոտությունների միջոցով պարզել ենք համավարակի պայմաններում օտար լեզուների ուսուցման արդյունավետությունը, կարևորել ենք օտար լեզվի իմացության դերը արդի ժամանակաշրջանում, ուսումնասիրել ենք հեռավար կրթության մոդելը ՀՀ-ում:

**Բանալի բառեր և բառակապակցություններ**

COVID-19 համավարակ, առցանց ուսուցում, հեռավար ուսուցում, օտար լեզուների դասավանդում, հեռավար կրթություն Հայաստանում:

## ОБРАЗОВАНИЕ В УСЛОВИЯХ НОВОГО КОРОНАВИРУСА, ОБУЧЕНИЕ ИНОСТРАННЫМ ЯЗЫКАМ В ПЕРИОД ПАНДЕМИ

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### **Аннотация**

Распространившаяся во всем мире с 2019 года эпидемия коронавируса оказала влияние на все сферы жизни, в частности, весьма пострадала образовательная система, поскольку переход на дистанционное образование вызвал большие затруднения в психологическом смысле. Кроме того встали проблемы технического оснащения и доступности интернета. Во всем мире немало людей, которые не в состоянии иметь собственный компьютер или смартфон для продолжения образования в дистанционной форме. Эпидемия, однако, стала также возможностью получения новых знаний. В условиях мирового локдауна, не выходя из дома и без затраты ресурсов, люди могли получать новые знания. При выполнении работы были проведены опросы среди студентов и путем исследований была выявлена эффективность обучения иностранным языкам в условиях эпидемии с учетом важности знания иностранных языков на современном этапе, исследована модель дистанционного образования в РА.

### **Ключевые слова и фразы**

Эпидемия COVID 19, онлайн-обучение, дистанционное обучение, преподавание иностранных языков, дистанционное образование в Армении.

### **Introduction**

On 31 December, 2019, a new type of coronavirus infection was registered in Wuhan, China, which in a short period began to spread around the world and affect everyone's life. The rapid spread of the infection, not yet known to humanity, led to

various forms of information dissemination. Coronavirus belongs to viruses that cause different respiratory diseases; from asymptomatic or mild to severe illnesses and death.

As early as 11 March 2020, the World Health Organization described the new coronavirus as a global pandemic and called on the world to participate in the process of overcoming it [1].

Studies have shown that new coronavirus infection is transmitted in different ways, and measures have been taken worldwide to prevent the spread of the virus. The outbreak in China began to spread throughout the world. To prevent the spread of infection, borders were closed, flights were suspended, public gatherings, public transportation, educational institutions were banned, and the use of medical masks became mandatory for everyone. Thus, the new COVID-19 restricted the activities of all sectors, forcing the world to seek new ways to continue a normal life.

Taking into account the urgency of the topic, we have set the following objectives .

- To Explore alternative ways of organizing education throughout the new Coronavirus pandemic;
- To Consider the strengths and weaknesses of distance learning;
- To Discover the new opportunities offered to humanity by the pandemic;
- To Study the model of distance education in the Republic of Armenia.

### **Education and COVID-19**

This public health crisis has had a dramatic impact on the education system. One of the first steps to prevent the spread of the epidemic was the closure of educational institutions. According to UNESCO, 1.5 billion children and youth have been affected by school closures in 195 countries, ranging from pre-school to higher education [2]. The world began to switch to distance learning, and webinars were organized to train teachers and lecturers to enable them to develop and successfully implement distance-learning programs. States faced the challenge of ensuring the sustainability of education in the face of an epidemic threat to national security, so the priority was given to the online platforms. Online learning has thus challenged alternatives to traditional classroom learning. Along with the organization of distance education, several difficulties were more psychological for both students and professors. Problems arose with the interpersonal contacts of students, the perception of the students' material, the individual characteristics of students, and the correct organization of the distance learning process. However, some studies have shown that distance education is a new form of education that provides a wide range of educational services to the general public through educational media.



One of the most commonly used terms throughout the epidemic is the concept of a «new norm». In order to meet the new standards of education, it was necessary to provide education through online learning tools. COVID-19 brought new ways of teaching. Educational institutions around the world moved to online learning platforms to further the learning process of students. Digital education became an indispensable resource for students and schools around the world. For many educational institutions, this was an entirely new form of education that they had to adopt. Like any other type of learning, distance learning has its pros and cons. Research and analysis of these advantages and disadvantages will enable educational institutions to develop new strategies for more effective education delivery.

### **The advantages of distance education**

- Distance education is much more accessible and flexible. Online learning for working students can be available in 24/7 format at the time, place, and reasonable price. Organizations save about 50% to 70% on training when they introduce online learning over instructor-led training due to reduced travel costs and non-requirement of logistics [3]. Online classes do not require physical presence, which helps reduce costs.
- Online education knows no geographic boundaries. Students from all over the world can assemble in an online classroom without crossing borders.
- Distance learning has no age limit. People of different age groups interested in any field of science can participate in online courses and register success.
- Distance learning provides a wide range of opportunities for people with disabilities, women raising children, those who do not have the chance to interrupt their primary work, and those living in remote areas.
- Online learning can be a source of motivation. Feedback from faculty students leads to increased self-confidence, encouraging students to participate more actively in the learning process. It can increase the effectiveness of learning.
- Distance learning is individual. That is, the learner decides the learning process. The distance learning student acquires skills and becomes more independent and self-responsible. Distance learning makes the learning process more creative and individual, thus facilitating the student's self-expression.
- In online learning, various video/audio materials, such as multimedia, can be combined with the materials provided, facilitating the understanding of the training materials. It is impossible only by the use of textbooks.

## **Disadvantages of distance education**

- The first disadvantage of distance education is the availability of technological equipment for everyone. It is difficult for vulnerable segments of society to obtain a computer or smartphone for online courses. For example, In Denmark, Slovenia, Norway, Poland, Lithuania, Iceland, Austria, Switzerland and the Netherlands, over 95% of students report that they have a computer to use for working at home, but in Indonesia, it is only 34% [4]

- In addition to technological equipment, Internet connectivity and stability is a significant problem. Failures in the Internet connection cause a learning process to fail, resulting in inefficient lesson time.

- Online education has reduced collaboration between students and teachers, leading to isolation as dependence on technological equipment increases.

- The remote system gradually leads to a lack of communication skills, resulting in students being unable to communicate and share knowledge.

- In online education, the emphasis is mainly on theoretical knowledge; practical skills are relegated to the background, as academic lectures are easier to implement in distance learning. In the case of language instruction, the teaching of spelling suffers greatly.

- In the case of online learning, there are several fields of education that are left out of competition, as this form is more suitable for social and humanitarian areas. For example, for medicine, mathematics, all branches of art, it is entirely ineffective.

- Due to the rapid spread of the virus, it was almost impossible to train all the teachers to organize distance learning courses properly.

- In online education, the objectivity of the assessment is also a big problem, as control is incomparably more complex, fraud detection is more complicated than in the case of traditional procedures.

- One of the main tasks of online learning is to find out the learner's identity during the knowledge test, as it is difficult to say who is on the other side of the connection. The use of cameras is recommended to address this problem but is not a complete solution.

## **COVID 19 and Armenia**

Along with the transition to distance education, dissatisfaction among the population due to being isolated increased. At the same time, however, we must be acknowledged that the distance learning model is a promising avenue for the

development and accessibility of education. Distance learning can be considered a self-learning tool of the 21st century. However, learning a foreign language during an epidemic can be very effective in preventing isolation, as mentioned above. Learning a new language during COVID-19 was an opportunity to continue everyday life and gain new skills.

On 1 March 2020, the first case of coronavirus infection was officially confirmed in the Republic of Armenia by a citizen from Iran. All those who had had contact with the latter were isolated, educational institutions were suspended until 9 March. On 16 March, a state of emergency was declared in Armenia, imposing several restrictions in all spheres of life [5]. Freedom of movement was restricted, rallies, vehicles, events and educational institutions were prohibited.

The declaration of an emergency state was, first of all, an excellent trial for the educational system of the Republic of Armenia. On 13 March 2020, the Minister of ESCS Arayik Harutyunyan, taking into account the need for measures to prevent the spread of coronavirus and instructions from the Ministry of Health, spoke about the suspension of classes on his Facebook live stream.

The Minister of ESCS called on all educational, cultural and sports organizations to organize themselves, to develop the most effective mechanisms not only to prevent the spread of the coronavirus but also to organize the educational process remotely on those days [6]. Along with online education, a crisis started in the RA education system, as not everyone was ready to switch to distance education. One of the first Armenian universities, where online education had already long been present via the Moodle learning platform, was the International Scientific-Educational Center of the National Academy of Sciences of the Republic of Armenia (ISEC NAS RA). After the educational institutions' suspension, ISEC NAS RA immediately switched to distance learning and resumed the online lessons.

The platforms mentioned above offer a number of services to their audience, aiming to modernize online education further.

Let's try to identify the advantages and disadvantages of the above-mentioned online platforms through research, compare the more widely used ZOOM and Google Meet remote platforms.

Following the introduction of online education under the emergency, ZOOM offered its free services. Various educational institutions in many countries began to use the Zoom Meetings Remote Management Platform to provide distance learning.

Concerning videoconferencing, ZOOM has a slight advantage over Google Meet. The most expensive paid version of ZOOM allows collecting the largest number of participants.

The most basic version of ZOOM is free, but in some cases, there are some limitations. It is noteworthy that we can organize videoconferences of up to 100 participants, which can last only 40 minutes.

Outside of the work program, ZOOM has unique solutions for education. Zoom Education licenses are intended for student, faculty, staff and alumni for pedagogical interaction within a classroom environment or the administration thereof and may not be used for any commercial purpose [7]. The educational program is available to a maximum of 149 hosts; each host has the possibility to organize an unlimited number of meetings, which can be accessed by more than 300 students. Google Meet is another online platform for remote meetings, video calls, and communication. Here, we have several options from which we can choose the one that best suits us. Although the free version of Meet is not very available, Google now allows you to use this version with some limitations. To unlock more features, you'll need to pay for Google Meet as part of a subscription to [Google Workspace](#) (formerly G Suite). Like Zoom, Google also offers education-specific Google Meet solutions [8].

#### **Similarities and differences**

- Both ZOOM and Google Meet have a screen sharing option that allows viewers to see what the presenter sees on the screen.
- Both platforms have the ability to record the lesson.
- Participants in Meet and Zoom can also raise their hands if they have to say something in a class or company meeting.
- In ZOOM, even with the free plan, you can [record a call](#), [mute participants](#), chat, share documents or your screen, make HD video calls, use a whiteboard or virtual backgrounds, send emojis, and a lot more: In case of Google Meet, G Suite subscribers can record meetings.
- From blurred to still photos and video backgrounds, Zoom has them all. Google Meet has none.
- One of the advantages of the ZOOM is the breakout rooms feature. If you're teaching groups, this is a must. This feature allows you to open multiple "rooms" and assign students to them for a set amount of time. You could use this to get students speaking in role-play tasks. Ensuring students are in smaller groups means that everyone is more likely to talk for longer than, say, a big group of 10, meaning students only get a few minutes speaking each lesson.
- The next advantage is the sound share. This enables students to hear the sounds that your computer is playing, whether they are music, or recorded dialogue, or the sounds from a video, or any other sound file you wish to have students hear during the class.

- When teaching/learning languages, professionals also use video-sharing. It's important not to over-use videos in the Zoom language classroom. Short, strategic use of videos is essential — not only to benefit language-learning but also to not overload the bandwidth requirements of your Zoom session.

- ZOOM is more suitable for remote oral examinations. You can organize your oral exams in the same manner you would organize them in the face-to-face classroom environment. Here ZOOM has another advantage; you can record the examination process if you wish to review it later for a more careful assessment of language produced by students.

It can be concluded from the above studies that it is more appropriate to use ZOOM to learn a foreign language, as the latter has many possibilities that can effectively contribute to language learning. The correct use of a remote platform can encourage students to learn new languages. However, we must note that the pandemic and many obstacles have also created opportunities for many people to improve and acquire new knowledge. In global isolation, people had the chance to use their free time at home to acquire new knowledge. Foreign Languages and Intercultural Communication Club of the National Academy of Sciences of the Republic of Armenia has not ceased its activities even during the days of the pandemic. Foreign languages such as English, Turkish, French and Azerbaijani continued to be taught online. During this period, there has been an increase in the number of applicants. New groups were formed, which quickly began to adapt to the learning process. Students were very enthusiastic about learning foreign languages online, as this allowed them to learn languages more interactively through alternative means. The online meetings were full of exciting video and audio courses, multimedia, various schemes and schedules. Students had the opportunity to strengthen their knowledge of the language more effectively through different methods.

Later, an alternative course was created to teach a foreign language, in particular, Azerbaijani. An attempt was made to allow students to learn a new foreign language in an alternative way. A channel was created on Telegram that allowed those interested in the language to unite to learn the language for free, at preferred hours on preferred terms [9]. It enabled people to learn any foreign language at home, without any age restrictions, without spending any resources. A survey of students following the channel showed that the language training was practical enough and attracted a lot of interest. The training is conducted in many interactive ways; video clips are posted, which help learn the correct pronunciation of foreign words, inquiries are made through quizzes, which further strengthens the taught material, and quizzes are performed to test the acquired knowledge. The only drawback of such education is that it suffers from the teaching of spelling.

Research has shown that efforts to learn languages were practical during the pandemic. A large number of students interested in foreign languages was an explicit confirmation of this. Many young people have started to participate actively in distance education, taking advantage of opportunities to acquire new knowledge.

### Conclusion

The new coronavirus has had an irreversible impact on people's lives. Especially the ideas about the traditional model of education changed. Nevertheless, learning effectively in various conditions remains a common goal for academics and university students. The traditional classrooms gave way to online platforms, and physical contact to gain new knowledge was no longer lost. Distance learning had both positive and negative effects. It can be said to allow students to receive an education that meets their needs. It is, therefore, necessary to build an open learning system based on distance learning technologies, the more advanced it is, the more effective it will be.

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## THE EFFICIENCY OF ANTI-CRISIS MEASURES FOR OVERCOMING THE ECONOMIC CRISIS CAUSED BY COVID-19 IN RA

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### **Abstract**

Due to the coronavirus pandemic, the world economy has entered a phase of another crisis at a fairly rapid pace since the beginning of 2020. The COVID-19 crisis has governments worldwide operating in a context of radical uncertainty and faced with difficult trade-offs given the health, economic and social challenges it raises.

The economic crisis caused by the coronavirus pandemic is unique; it is difficult to predict its possible depth. Governments in almost every country in the world have tried, and continue to try, to find the right balance between saving lives and saving national economies. Many governments at all levels have reacted quickly, applying a place-based approach to policy responses and implementing appropriate measures in response to the COVID-19 crisis.

In general, the effectiveness of the anti-crisis measures taken by the Government can be preliminarily evaluated by analyzing the financial allocations volume and GDP ratio index and the range of beneficiaries of these measures.

The most effective way to overcome the current economic crisis is to inject sufficient liquidity into the economy, which will help avoid a sharp decline in both aggregate supply and demand; otherwise, the economy will inevitably end up in a long period of decline.

To overcome the economic crisis, the Government of the Republic of Armenia developed and implemented a number of anti-crisis measures, which did not stand out with high efficiency due to small allocations for anti-crisis measures well as due to the narrow range of beneficiaries.

### **Keywords and phrases**

Economic crisis, coronavirus pandemic, anti-crisis measures, financial resources, efficiency.



**COVID-19-Ի ԱՐԴՅՈՒՆՔՈՒՄ ԱՌԱՋԱՑԱԾ ՏՆՏԵՍԱԿԱՆ ՃԳՆԱԺԱՄԻ  
ՀԱՂԹԱՀԱՐՄԱՆ ՄԻՋՈՑԱՌՈՒՄՆԵՐԻ ԱՐԴՅՈՒՆԱՎԵՏՈՒԹՅՈՒՆԸ ՀՀ-ՈՒՄ**

**ԿԱՐԵՆ ՍԱՐԳՍՅԱՆ**

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**Համառոտագիր**

Կորոնավիրուսային համաճարակի պատճառով սկսած 2020 թվականից համաշխարհային տնտեսությունը բավականին արագ տեմպերով թևակոխել է մեկ այլ ճգնաժամի փուլ: COVID-19 ճգնաժամը աշխարհի կառավարություններին, որոնք առերեսվել են դժվարին փոխզիջումների՝ կապված առողջապահական, տնտեսական և սոցիալական մարտահրավերների հետ, ստիպում է գործել բացարձակ անորոշության պայմաններում:

Կորոնավիրուսային համավարակի պատճառած տնտեսական ճգնաժամը եզակի է իր բնույթով և դժվար է կանխատեսել դրա հնարավոր խորությունը: Աշխարհի գրեթե բոլոր երկրների կառավարությունները փորձել են և շարունակում են փորձել գտնել ճիշտ հավասարակշռություն մարդկային կյանքերը և ազգային տնտեսությունները փրկելու միջև: Բազմաթիվ երկրների բոլոր մակարդակների կառավարությունները արագ արձագանքել են՝ արձագանքման քաղաքականության համար կիրառելով տեղային մոտեցում և իրականացնելով համարժեք միջոցառումներ՝ COVID-19-ի ճգնաժամին հակազդելու համար:

Ընդհանուր առմամբ, Կառավարության կողմից ձեռնարկված հակաճգնաժամային միջոցառումների արդյունավետությունը կարելի է նախնական գնահատել՝ վերլուծելով ֆինանսական հատկացումների ծավալը և ՀՆԱ հարաբերակցության ցուցիչը, ինչպես նաև այդ միջոցառումների շահառուների շրջանակը:

Ներկայիս տնտեսական ճգնաժամի հաղթահարման ամենարդյունավետ միջոցը տնտեսության մեջ բավարար իրացվելիություն ներարկելն է, ինչը կօգնի խուսափել ինչպես համախառն առաջարկի, այնպես էլ համախառն պահանջարկի կտրուկ անկումից, հակառակ դեպքում տնտեսությունն անխուսափելիորեն հայտնվելու է անկման երկար փուլում: Տնտեսական ճգնաժամը հաղթահարելու համար ՀՀ կառավարությունը մշակեց և իրականացրեց հակաճգնաժամային մի շարք միջոցառումներ, որոնք չառանձնացան բարձր արդյունավետությամբ հակաճգնաժամային միջոցառումների գծով փոքրածավալ հատկացումների, ինչպես նաև դրանց շահառուների նեղ շրջանակի պատճառով:

## **Բանալի բառեր և բառակապակցություններ**

Տնտեսական ճգնաժամ, կորոնավիրուսի համավարակ, հակաճգնաժամային միջոցառումներ, ֆինանսական միջոցներ, արդյունավետություն:

## **ЭФФЕКТИВНОСТЬ АНТИКРИЗИСНЫХ МЕР ПРЕОДОЛЕНИЯ ЭКОНОМИЧЕСКОГО КРИЗИСА ВЫЗВАННОГО COVID-19 В РА**

### **КАРЕН САРГСЯН**

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### **Аннотация**

Из-за эпидемии коронавируса мировая экономика вступила в очередную фазу кризиса, причем довольно быстрыми темпами, начиная с 2020 года. Кризис COVID-19 вынуждает правительства всего мира действовать в полной неопределенности, сталкиваясь с трудными компромиссами в отношении здоровья, экономических и социальных проблем.

Экономический кризис, вызванный коронавирусом, носит достаточно уникальный характер, его возможную глубину предсказать сложно. Правительства почти всех стран мира пытались и продолжают пытаться найти правильный баланс между спасением жизней и «национальной экономикой». Многие правительства быстро отреагировали на всех уровнях, используя местный подход к политике реагирования и принимая адекватные меры для реагирования на кризис COVID-19.

В целом эффективность антикризисных мер, принимаемых Правительством, можно оценить заранее, проанализировав объем финансовых ассигнований, их соотношение ВВП к ВВП, а также круг бенефициаров этих мер.

Самый эффективный способ преодоления текущего экономического кризиса - это вливание в экономику достаточной ликвидности, которая поможет избежать резкого падения как совокупного предложения, так и совокупного спроса, в противном случае экономика неизбежно окажется в длительной фазе спада.

Для выхода из экономического кризиса Правительством Республики Армения был разработан и реализован ряд антикризисных мер, которые не отличались высокой эффективностью, небольшими ассигнованиями на антикризисные меры, а также узкими рамками круга бенефициаров.

## **Ключевые слова и фразы**

Экономический кризис, эпидемия коронавируса, антикризисные меры, финансовые средства, эффективность.

## **Introduction**

Due to the coronavirus pandemic, the world economy has entered a phase of another crisis at a fairly rapid pace since the the beginning of 2020. The COVID-19 crisis has governments worldwide operating in a context of radical uncertainty and faced with difficult trade-offs given the health, economic and social challenges it raises. Within the first three months of 2020, the novel coronavirus developed into a global pandemic. Earlier, in February, the International Monetary Fund announced that in 2020, a global recession is likely to occur, which may be even more severe than the global financial crisis of 2008.

More than half of the world's population has experienced a lockdown with strong containment measures –the first time in history that such measures are applied on such a large scale. Beyond the health and human tragedy of COVID-19, the latter caused global economic challenges for almost all world countries.

It is already visible that in 2020 the world economy is expected to experience a sharp decline due to the severe quarantine and severe economic restrictions imposed by many countries to prevent the spread of the pandemic. In most places, whereas the incidence of the virus is still prevalent, Governments face the difficult choice between public safety and reviving the economy. This is particularly prominent in countries with workforces comprised largely of informal workers, where (rather than whereas) countries lack in capacities to balance the effects of the lockdown economically, and with the vulnerable and marginalized communities bearing the negative impacts of the economic and the health losses(1).

## **Theoretical and methodological bases**

The crisis is defined as "a turning point in the development of the structure of the system during its transition to a qualitatively different state"(2). It is characterized by a special instability and nonlinearity of the parameters of the system. The coincidence of time even the weakest (and for this reason not taken

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(1)Putting the UN framework for socio-economic response to COVID-19 into action: Insights/UNDP, Brief#2- June 2020

(2)Mim S. (2009) *Disadvantages of Capitalism. Thought. 2009. № 3 (39). Available from: www.idea-magazine.com.ua.(in Russian)*

into account in conditions of stable development) of external influences can cause the imposition of these unaccounted weak influences and lead to strategic changes, to a complete restructuring system(3).

The openness of national economies and the globalization of world economic processes contributed to the fact that in the shortest possible time any manifestation can rapidly spread economic instability in one country and around the world, and taking more and more complex forms, turn into a global economic crisis. Their seriousness and the negative consequences of the crises on each national economy largely depends on the economic policy conducted by the given state and the anti-crisis policy efficiency(4).

It should be noted that the coronavirus itself is not as terrible for the economy as the steps that almost all countries in the world have to take to protect themselves from it. Stringent containment measures and non-pharmaceutical interventions effectively contained the spread of the coronavirus disease (COVID-19) and limiting fatalities, ensuring that the medical systems around the world were not overwhelmed. Stringent containment measures and non-pharmaceutical interventions were effective in containing the spread of the coronavirus disease (COVID-19) and limiting fatalities, ensuring that the medical systems around the world were not overwhelmed(5). While the lives saved have laid the foundation for a resumption of growth in the medium term(6), the Great Lockdown resulted in large short-term economic losses and a decline in global economic activity not seen since the Great Depression(7).

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(3) Acemoglu, D., Robinson, J. (2012). *Why Nations Fail: The origins of Power, Prosperity and Poverty First Edition*. New York: Crown Business. 529 p.

(4) Sargsyan K.S. *The economic impacts of covid-19 and the issues of its overcoming in the republic of Armenia./Scientific Proceedings, Shirak State University/N2 2020, pp.58-68*

(5) Deb P., Furceri D., Ostry J. and Tawk N. *The Effects of Containment Measures on the COVID-19 Pandemic. Covid Economics.// Vetted and Real-Time Papers.2020. 19. P. 53–86.*

(6) Barro R. J., Ursúa J. F. and Weng J. *The Coronavirus and the Great Influenza Pandemic: Lessons from the „Spanish Flu“ for the Coronavirus“s Potential Effects on Mortality and Economic Activity. NBER Working Paper 26866.2020.*

(7) Baldwin R, and Weder di Mauro. *Mitigating the COVID Economic Crisis: Act Fast and Do whatever it Takes. London: CEPR Press. 2020*

the vulnerable and marginalized communities bearing the negative impacts of the economic and the health losses.

### **Investigation methods**

In general, the effectiveness of the anti-crisis measures taken by the Government can be preliminarily evaluated by analyzing the financial allocations volume and GDP ratio index and the range of beneficiaries of these measures.

At the same time, there are some peculiarities in overcoming the crisis. Governments face a complex trade-off: managing the economic recovery and mitigating the impact of a second wave of the virus. The COVID-19 crisis has a strong territorial dimension with significant policy implications for managing its consequences.

Two central considerations for policymakers are:

- The regional and local impact of the crisis is highly asymmetric within countries. Some regions, particularly the more vulnerable ones, such as deprived urban areas, have been harder hit than others. Certain vulnerable populations, too, have been more affected. In economic terms, the impact of the crisis is differing across regions, at least in its initial stages. Differentiating factors include a region's exposure to tradable sectors, its exposure to global value chains and its specialization, such as tourism.

- Subnational governments – regions and municipalities –are responsible for critical aspects of containment measures, health care, social services, economic development and public investment, putting them at the frontline of crisis management. Because such responsibilities are shared among levels of Government, coordinated effort is critical(8).

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(8) <http://www.oecd.org/coronavirus/policy-responses/the-territorial-impact-of-covid-19-managing-the-crisis-across-levels-of-government-d3e314e1/>

## Results Obtained

The economic impact of the COVID-19 crisis differs across regions, depending on the region's exposure to tradable sectors and global value chains. For example, regions with economies that are heavily dependent on tourism will be more affected by the coronavirus than other regions. Capital regions or other metropolitan regions show a relatively higher risk of job disruption than other regions<sup>(9)</sup>. The crisis' impact on regional employment may also vary significantly across regions within countries. Regions with large shares of non-standard employment can help explain within-country differences arising from the COVID-19 crisis. Evaluating the share of jobs potentially at risk from a lockdown is one way to assess the territorial impact of the COVID-19 crisis.

In the short term, tourist destinations and large cities are suffering the most from COVID-19 containment measures. The importance of tourism and local consumption – including large retailers, general-purpose stores, and businesses in the hospitality industry, such as coffee shops and restaurants – partially explains this. The extent to which activities have recovered during the high tourist season is essential to determine the actual economic decline in tourist destinations.

The more prolonged and more stringent the containment measures, the higher the risk for regional economies. In summer 2020, targeted (localized) lockdowns were adopted in several countries to minimize the costs of national lockdowns. In autumn 2020, some countries were going back to national confinement measures to mitigate the impact of the second wave of cases. Possible stop-and-go measures are expected in the coming months until vaccination is available. The full effect for 2020 is yet to be calculated. Previous OECD work shows that the recovery of OECD regions after the 2008 global financial crisis took years. In more than 40% of OECD and EU regions, even seven years after the start of the crisis, per capita GDP was still below pre-crisis levels.

The economic impact of the COVID-19 crisis first reverberated through the financial markets as international investors started to withdraw investments from the region. The yield curves for government bonds of all EaP governments rapidly grew steeper in March, as the severity of the crisis became apparent. The currencies of Georgia, Moldova and Ukraine lost over 10% of their value relative to the dollar by April. The lockdown measures saved countless lives but brought economic activity to a halt except for Belarus, where authorities did not impose a national lockdown. Closed borders disrupted trade and tourism flows and prevented many seasonal workers,

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(9) <http://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-eu-eastern-partner-countries-7759afa3/>

especially in the agricultural sector, from going abroad for work. At the same time, the fall in global commodity prices directly affected Azerbaijan, Armenia and Belarus, in particular. In contrast, the fall in remittance inflows compounded the adverse negative effects across the region. The economic impact in the second quarter of 2020 surpassed the severity of the Global Financial Crisis. According to EBRD estimates, the output will fall by 4.5% this year in the EaP region (10).

The stringent containment measures to combat the spread of the virus led to significant short-term declines in output. During the period of national lockdowns, several service sectors, such as those related to tourism and proximity services that require direct contact between customers and service providers, saw virtually all of their revenues disappear due to the restrictions on movement and the requirements of social distancing. Most retailers and restaurants were closed for extended periods. Increasing in their online and take-away sales did not compensate for the massive drop in demand, particularly in places where internet penetration is lower and cyber-commerce less developed. Moreover, non-essential construction work was affected by limited labour mobility and reductions in investment.

Altogether, the most affected sectors account for 30-40% of total output in the EaP economies. The impact of containment measures on annual GDP growth will ultimately depend not only on how long these measures remained in place but also on other factors, such as the speed or magnitude of policy responses, activity in other sectors of the economy, changes in the terms of trade, and any indirect/second-order effects of the drop in sectoral output. Based on the assumption of complete or partial lockdowns in selected sectors, the immediate impact on any given economy for the duration of the lockdown is estimated to be between 20 and 30% of GDP depending on the structure of economy. For example, Georgia's economy, which is mostly driven by the services sector, can be expected to contract by around 30%, while economies driven more by extractive (Azerbaijan) and manufacturing sectors (Ukraine) will be confronted with a more minor direct impact of containment measures. However, developments in external markets will add to the impact (e.g. drop in oil prices will have important effects on Azerbaijan). Google Mobility reports (for Belarus, Georgia, Moldova, and Ukraine) and the Yandex Mobility Index (excluding Ukraine) show how the pandemic is affecting people's movement in EaP countries. In Georgia and Moldova, the number of visits and time spent at grocery stores and pharmacies declined by over 60% compared to normal during the period of lockdown, and visits to workplaces by over 70%. The Yandex Mobility Index highlighted similar trends in Armenia and Azerbaijan in April. In Belarus, the slowdown was less

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(10) <http://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-eu-eastern-partner-countries-7759afa3/>

dramatic, with about a 30% drop in the number of visits to grocery stores and a 20% drop in the number of visits and time spent at workplaces. During the summer, mobility patterns started to return to pre-crisis baselines, but the number of visits to workplaces continued to remain 20% under normal levels in Belarus, Georgia, Moldova and Ukraine(11).

There are several ways in which the COVID-19 crisis affected the business community. On the supply side, the public health crisis and lockdowns caused shortages of labour, as workers felt unwell or had to stay at home with children during the closures of schools. Also, international and domestic supply chains were disrupted, causing shortages in intermediate goods. However, more severe and longer-term consequences of the crisis will be felt on the demand side. Lockdowns resulted in a dramatic loss of demand in so-called non-essential sectors, causing liquidity shortages, especially to SMEs, often undercapitalized.

Moreover, recession in all the EaP countries, accompanied by layoffs and higher uncertainty, will likely result in lower consumption and firms' revenues in the coming months. Early evidence of this impact is provided by a World Bank Enterprise Survey conducted in June 2020 in four EaP countries. More than 50% of respondent firms reported experiencing decreases in their monthly sales compared to the previous year, ranging from 56% in Belarus to more than 90% in Moldova. Moreover, the volume of sales declines was unprecedented, averaging 57% in the four countries covered by the survey. The drop in revenues resulted in layoffs, for example in Georgia where 25% of companies had reduced employment since the outbreak of the crisis

In response to COVID-19, Armenia adopted 25 anti-crisis measures to support households and businesses. As of 10 September, the Government had spent AMD 163.4 billion (USD 340 million or 2.5% of GDP), exceeding the initially approved AMD 150 billion (approx. USD 313 million) support package(12).

Measures to support enterprises include efforts to mitigate liquidity risks by co-financing and refinancing loans, as well as interest rate subsidies. Businesses can apply for loans with preferential conditions to pay for salaries, equipment, food imports and raw materials, taxes, duties and utilities. The maximum amount of the financial package for single businesses has amounted to AMD 500 million (approx. USD 1 million). An additional programme was introduced for SMEs in tourism, agriculture, food and manufacturing, allowing them to obtain loans of AMD 2.5 to 50 million with a six-month grace period and no interest during the first two years, though a 12% rate would be

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(11) <http://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-eu-eastern-partner-countries-7759afa3/>

(12) <https://www.gov.am/am/covid-19-cragrer/>



applied during the third year. By mid-May, loan applications worth USD 17 million had been approved for 744 entities.

Further sector-specific measures were adopted: agricultural entities and co-operative farms benefit from interest rate subsidies and co-financing mechanisms, while grape suppliers and brandy and wine companies can apply for loans with full interest subsidies. For transport companies operating in the tourism sector, the state will cover 75% of the interest unpaid since April 2020 on existing loans until March 2021. Moreover, the Government fosters entrepreneurship through one-time grants in the IT sector and interest-free loans to help individuals launch their business.

Armenia also encouraged job retention through wage subsidies: businesses with 2 to 50 employees received one-time grants to cover the salaries of every fifth employee (for businesses with less than five employees, the amount of the support equals the monthly payroll fund divided by the number of employees). A similar measure was implemented in May for businesses with up to 100 employees, provided that they had maintained employment since February. Tourism-related enterprises that have maintained over 70% of their staff or 25% of payroll will benefit from wage subsidies for every third employee for nine months.

Armenia has also introduced social support measures, such as one-time payments worth AMD 68,000 (approx. USD 140) for citizens with limited income who lost their jobs between mid-March and 1 June. Further financial assistance was introduced for pregnant women, low-income families, students, and individuals working in sectors particularly affected by the crisis (incl. hospitality, tourism and retail). The Government has approved an additional assistance package to create 1,000 temporary jobs in the agriculture sector.

As for monetary policy while crisis caused by pandemic, the Central Bank of Armenia (CBA) gradually reduced the policy rate up to 4.25 percent as of September 2020. The interbank market has been active. The central bank has easily met liquidity needs so far and provided a few foreign exchange swap operations to assure sufficient liquidity in dram and foreign currency. The exchange rate has been allowed to adjust flexibly and has appreciated to pre-pandemic level against the USD. No balance of payment or capital control measures have been adopted (13).

For the year 2020, Armenia's economy GDP shrank by 7.6%. It was the sharpest decline in economic activity since 2009. The volume of construction decreased by 6.6%, the volume of industrial production by 3.4%, the trade turnover by 11.7%, the volume of

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(13) Sargsyan K.S. *The economic impacts of covid-19 and the issues of its overcoming in the republic of Armenia./Scientific Proceedings, Shirak State University/N2 2020, pp.58-68*

services by 9.3%, accommodation and public catering 45.1%, Culture, entertainment and Recreation by 28.4%, transportation and storage by 33.7%, etc. (14).

The Government has committed GEL 3.55 billion (approx. USD 1.1 billion or 7.1%) to help the economy weather the impact of the pandemic. On 24 April, the Government presented an anti-crisis package focusing on providing social support (GEL 1.04 billion), stimulating economic growth (GEL 2.11 billion) and strengthening the healthcare system (GEL 350 million) to fight the pandemic. Sector-specific plans were introduced, notably for tourism, agriculture and construction, and additional measures were announced on 6 August.

The central bank has introduced measures to promote liquidity, while commercial banks have allowed borrowers to postpone loan repayments by up to three months and restructured loans for businesses and individuals struggling with loan repayments. The volume of VAT returns in the private sector was doubled to GEL 1.2 billion (USD 374.4 million) to supply firms with working capital. To further support access to finance, the credit guarantee scheme was increased by GEL 330 million, securing a GEL 2 billion credit portfolio with a 90% guarantee on new loans and 30% on restructuring. Moreover, businesses benefit from improved co-financing conditions on loans/leasing and a micro-grant system, while further funds were allocated to the agro-credit programme. Additional measures have been implemented for sectors that have been particularly affected by the pandemic, such as property and income tax deferrals for the tourism sector and up to 80% interest subsidies on pre-existing loans for small hotels. Reclamation debts from 2012 onwards will be written off for individuals and entities, and irrigation tax in 2020 will be exempted.

In addition, the Government offered state subsidies to employers who retained jobs through income tax exemptions worth GEL 250 million (USD 77 million), as well as lump-sum payments to 250 000 self-employed (15).

The anti-crisis package also provides for targeted social assistance: an estimated 350 000 individuals who lost their jobs or are on unpaid leave are receiving a monthly allowance of GEL 200 for six months. Financial support is granted to low-income families and vulnerable groups, pensions were increased, and will be indexed to the inflation rate starting from January 2021. Further measures have included utility bill and food price subsidies.

Regardless of their assessment of the public health risks of COVID-19 spreading in Belarus, the authorities are well aware that the country must absorb the economic shock of the crisis. At the end of April, the Government estimated its overall support

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(14) <https://www.armstat.am/am/?nid=157&id=772>

(15) <http://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-eu-eastern-partner-countries-7759afa3/>

package, both direct and indirect, at a total amount of BYN 5 to 6 billion (USD 1.9 to 2.3 billion), i.e. 3-4% of annual GDP.

To support the economy in view of the pandemic, a decree adopted on 24 April introduced measures targeting the most affected sectors: it notably foresees payment holidays and instalments, rent payment holidays, and municipal authorities' possibility to reduce property taxes. Public procurement procedures have also been temporarily simplified. As of 2 October, 47,000 entities and individual entrepreneurs had reportedly benefited from the tax reliefs in the amount of BYN 34 million (USD 13 million), while about 8 000 rent holidays worth over BYN 30 billion (USD 11.45 million) had been approved. In addition, state banks provided state-guaranteed loans of BYN 700 million (USD 267 million) in over 50 businesses. The National Bank has also asked commercial banks to delay loan and interest payments for citizens as their incomes have been affected by COVID-19, and not to raise interest fees. It relaxed certain prudential requirements, reduced the value of the capital conservation buffer to 2 percentage points and lowered the liquidity coverage ratio from 100% to 80% on 22 April, and cut its refinancing rate twice (in May and July), from 8.75% to 7.75% (16).

Further measures were implemented to support employees. Belarus initially decreed that those unable to return from abroad or work under self-quarantine are entitled to keep their jobs and are entitled to at least two-thirds of their salary. At the end of May, the state also offered subsidies to help maintain salaries of employees whose working hours had been reduced between May and July and pay dues to the state social security fund.

Regarding price increases, the initial resolution of the Council of Ministers preventing price rises for goods and services from exceeding 0.5% monthly was withdrawn. The Ministry of Antimonopoly Regulation and Trade passed a decree on 15 April, enabling the state to regulate prices for 26 essential products (mainly food and sanitary products) by limiting profitability and mark-ups on these items. This measure was extended until the end of 2020. Low-income citizens were granted the social allowance in August even if their rights were to expire in May-July.

Azerbaijan has introduced a broad economic support package worth up to AZN 3.3 billion (approx. USD 2 billion or 4% of GDP).

While targeting sectors that were expected to be hit the hardest (including tourism), the Government sought to cover tax breaks for businesses, support mortgage borrowers and transport companies, and assist with utility payments. Businesses can also apply for state guarantees for 60% of the loan amount and 50% interest rate subsidies for selected new loans, along with interest rate subsidies worth 10% of interest

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(16) <http://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-eu-eastern-partner-countries-7759afa3/>

expenses for existing loans during one year. As of 17 September, 253 loans worth AZN 52.6 million (USD 31 million) had been approved (17).

## Conclusion

Referring to the effectiveness of the anti-crisis measures taken by the Government, it should be noted that the latter can be preliminarily evaluated by analyzing the financial allocations volume and GDP ratio index and the range of beneficiaries of these measures.

The anti-crisis allocations volume and GDP ratio in Armenia is about 2.3% of Armenia's GDP. Governments worldwide have allocated significant financial resources, averaging between 7% and 15% of their GDP, to support national economies in overcoming the economic effects of the pandemic. In particular, 10% of GDP in the USA, 15% in Great Britain, 18% in Italy, 15% in Spain, 21% in France, 6.5% in Switzerland, 10% in Poland, 8% in Estonia 6%. As for EaP countries, the financial support volume amounted in Georgia 7.1%, in Belarus 4%, in Azerbaijan 4% and etc. Comparing this figure with the data of other countries, it becomes evident that in Armenia, the support measures allocations are very low to ensure high efficiency.

As for the range of beneficiaries of support measures, comparing with other regional countries, it becomes obvious that the range is quite narrow and although the Government has gradually expanded it to some extent, still many businesses and social groups have been left out of that range, which, of course, has a negative impact on the socio-economic situation of the country. Taking into account the above, we can not speak about the high efficiency of those measures.

During any economic crisis, governments are encouraged to expand the financing of the economy, both through support for various sectors and through increased budget spending. Therefore, it is not accidental that the representatives of the International Monetary Fund and other international economic organizations repeatedly urge governments to expand the injection of financial resources into the economy. Of course, this will lead to an increase in public debt, but if such steps are not taken in the future, it will take more resources and a long time period to get the economy out of deep depression. In fact, the absolute size of public debt cannot provide as much information about the economic situation as the directions of use of the funds involved and effective management of public debt risks. Along with the growth of the actual public debt in Armenia, there must

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(17) <http://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-eu-eastern-partner-countries-7759afa3/>

be significant changes in the structure of the economy, increasing its inclusiveness and stimulating large inflows of investments in the real sector of the economy.

Thus, to face further serious challenges, it is necessary to review the amount of anti-crisis measures, the allocations, and the scope of their beneficiaries. One of the most important measures to overcome the current economic crisis is to inject sufficient liquidity into the economy, which will help avoid a sharp decline in aggregate supply and aggregate demand. Otherwise, the economy will inevitably find itself in a long period of decline. As we see, it is not sufficient in Armenia at the moment.

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**Abstract**

The purpose of this paper is to introduce the importance of professional and transferable skills of the doctoral candidate, stimulate discussion about the impact and effective management of the doctorate in a context of reforms in the policies and processes of third-level higher education.

Training of professional skills gives some discussion in doctoral studies about the availability and acquisition of graduate skills at the previous levels of higher education. It is assumed that the applicant in a specific area should already have the set of skills that will be fully applicable to doctoral studies and will be satisfying for the full realization of the graduate's professional qualifications.

A doctorate graduate must have adequate professional skills in the areas of research, education, cooperation and teamwork, innovation, etc. and therefore should have the skills that can be transferred from science/research to pedagogy/education or from pedagogy/education to leadership. Thus, transferable skills are universal and are an essential tool for all aspects of the doctor's professional realization. This is why doctoral students are mostly trained in transferable rather than vocational/professional skills.

It is important to investigate the awareness of teachers and students at the universities related to the necessity to enhance creativity within and by the academic community. Therefore, today's educational programs are considered competitive, with the result that not only "academic" but also "creative skill" graduates. In this regard, special emphasis should be placed on the student's not formal but productive individual work to develop creativity, an innovation that is one of the requirements of the current Bologna process.

At present, universities are facing a challenge to revise the direction of providing educational services in such a way as to reinforce the employer-HEI bridge and the dynamic changes taking place in the labor market by taking into account. The involvement of future employer in the management processes of doctorate and career development is important.

A postgraduate student - PhD must demonstrate leadership skills in a working environment, directing the teamwork of large or small groups of employees to achieve effective outcomes. And if the traditional administrator guided the process in accordance with established organizational standards and norms, the doctor with a degree would show creative approaches here, trying to transform and develop the team management process, using his high professional qualities.

### **Keywords and phrases**

Doctorate, career management, professional and transferable skills, doctoral candidate leadership.

## **ԿԱՐԻԵՐԱՅԻ ԶԱՐԳԱՑՄԱՆ ԿԱՌԱՎԱՐՈՒՄԸ ԴՈԿՏՈՐԱՆՏՈՒՐԱՅՈՒՄ**

### **ԱՏՈՄ ՄԽԻԹԱՐՅԱՆ**

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Ֆիզիկամաթեմատիկական գիտությունների թեկնածու, դոցենտ  
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### **Համառոտագիր**

Սույն հոդվածի նպատակն է ներկայացնել դոկտորանտի մասնագիտական և փոխանցելի հմտությունների կարևորությունը, խթանել դոկտորանտուրայի արդյունավետ կառավարման ու ազդեցության վերաբերյալ քննարկումները երրորդ մակարդակի բարձրագույն կրթության քաղաքականության և գործընթացների բարեփոխումների համատեքստում:

Մասնագիտական հմտությունների ուսուցումը դոկտորանտուրայում որոշակի քննարկումների տեղիք է տալիս՝ կապված բարձրագույն մասնագիտական կրթու-

թյան նախորդ մակարդակներում արդեն իսկ շրջանավարտի հմտությունների առկայության հետ: Ենթադրվում է, որ կոնկրետ մասնագիտությամբ դիմորդ-մագիստրոսը պետք է որ արդեն տիրապետի հմտությունների այնպիսի գործիքակազմի, որը ամբողջովին կիրառելի կլինի դոկտորանտուրայում և կբավարարի հետազոտող շրջանավարտի մասնագիտական ունակությունների լիարժեք իրացմանը:

Դոկտորանտուրայի շրջանավարտը համարժեք մասնագիտական հմտություններ պետք է ցուցաբերի գիտական, կրթական, կառավարչական, նորարարությունների ընդհանրացման ոլորտներում և հետևաբար պետք է տիրապետի այնպիսի հմտությունների, որոնք փոխանցելի կլինեն գիտությունից դեպի մանկավարժություն կամ մանկավարժությունից դեպի առաջնորդություն: Այս է պատճառը, որ դոկտորանտուրայում շեշտը դրվում է ավելի շատ փոխանցելի, քան մասնագիտական հմտությունների ուսուցման վրա:

Այսօր մրցակցային են համարվում այն կրթական ծրագրերը, որոնց վերջնարդյունքներով ձևավորվում են ոչ միայն «գիտակ», այլև «ստեղծարար հմտություններով» շրջանավարտներ: Այս առումով մասնագիտական կրթական ծրագրերում ներկայումս մեծ ուշադրություն պետք է դարձվի ուսանողի ոչ թե ձևական, այլ արդյունավետ անհատական աշխատանքի վերջնարդյունքներին՝ նպատակ ունենալով սովորողի մեջ զարգացնելու ստեղծարարությունը, նորարարությունը և ինքնադրսևորումը, որը Բոլոնիայի ներկայիս գործընթացի պահանջներից մեկն է:

Ներկայումս համալսարանների առջև խնդիր է դրվում վերանայելու կրթական ծառայությունների մատուցման ուղղությունները այնպես, որ ամրապնդվի «գործատու-բուհ» կամուրջը, հաշվի առնվեն աշխատաշուկայում տեղի ունեցող փոփոխությունները: Կարևորվում է ապագա գործատուի ներգրավումը դոկտորանտուրայի կառավարման և կարիերայի զարգացման գործընթացներում:

Դոկտորը աշխատանքային միջավայրում պետք է ցուցաբերի առաջնորդի հմտություններ՝ ուղղորդելով աշխատողների մեծ կամ փոքր խմբերի թիմային գործունեությունը՝ արդյունավետ կերպով նախանշված արդյունքներին հասնելու համար: Եթե ավանդական կառավարիչը այդ գործընթացը կուղղորդեր նախօրոք սահմանված չափանիշներով և նորմերով, ապա դոկտորի աստիճան ունեցող առաջնորդը այստեղ ստեղծարար մոտեցումներ կցուցաբերեր՝ փորձելով վերափոխել և զարգացնել թիմային կառավարման գործընթացը՝ օգտվելով իր մասնագիտական բարձր որակներից:

### **Բանալի բառեր և բառակապակցություններ**

Դոկտորանտուրա, կարիերայի կառավարում, մասնագիտական և փոխանցելի հմտություններ, ասպիրանտի առաջնորդություն:



## УПРАВЛЕНИЕ РАЗВИТИЕМ КАРЬЕРЫ В ДОКТОРАНТУРЕ

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#### Аннотация

Рассмотрено значение профессиональных и передаваемых навыков докторанта/аспиранта, стимуляция обсуждений эффективного менеджмента и влияния докторантуры в контексте политики и реформ процессов третьего уровня высшего образования.

Изучение профессиональных навыков в докторантуре служит поводом для дискуссий, связанных с наличием умений, приобретенных на предыдущих уровнях высшего профессионального образования. Предполагается, что претендент-магистр по конкретной специальности уже должен владеть таким инструментарием навыков, которые будут применимы в докторантуре и достаточны для реализации профессиональных навыков исследователя.

Окончивший докторантуру специалист должен проявлять профессиональные навыки в научной, образовательной, управленческой сферах, а также в сфере инновационных обобщений, следовательно, должен обладать такими навыками, которые могут передаваться от науки к педагогике или от педагогике к лидерству. Именно поэтому в докторантуре изучаются преимущественно передаваемые, а не профессиональные навыки.

Конкурентными сегодня считаются учебные программы, которые в результате формируют не только “знатока”, но и “носителя творческих навыков”. В этом смысле в настоящее время в образовательных профессиональных программах большое внимание должно уделяться на формальным, а эффективным конечным результатам индивидуальной работы, имея целью развитие у учащегося созидющего, инновационного подхода и самоутверждения, что является одним из требований нынешнего Болонского процесса.

В настоящее время перед университетами ставится задача пересмотра путей предоставления образовательных услуг таким образом, чтобы укрепить мост

“работодатель – вуз” так, чтобы учитывать происходящие на рынке труда изменения. Важное значение придается вовлечению будущего работодателя в процессы управления докторантурой и карьерного развития.

В рабочей среде доктор должен проявлять искусство руководителя, культивируя командную деятельность больших или малых групп работников для эффективного достижения предначертанных результатов. Если традиционный менеджер направлял бы этот процесс по заранее намеченным параметрам и нормам, то руководитель со степенью доктора проявит здесь творческий подход, пытаясь преобразовать и развить процесс командного управления, используя высокие профессиональные навыки.

### **Ключевые слова и фразы**

Докторантура, аспирантура, управление карьерой, профессиональные и передаваемые навыки, лидерство докторанта

## **Introduction**

Doctoral research plays a crucial role in driving innovation and growth of nation-states and is a significant contributor to national and international knowledge generation and research outputs [1]. Still, there is a striking absence of systematic research into the multidimensional impact of the doctorate. This paper attends to the growing preoccupation in higher education policy with the performance, outcomes, and returns on public investment in research through its concern with doctoral impact. Around the world, government and private organizations are investing considerable time, energy and resources into identifying and tracking the social and economic contributions and impact of research and the doctorate [2].

The most popular academic degree in the World is Doctor of Philosophy (PhD) after completing the doctorate. Here the word "philosophy" should be interpreted broader. In ancient Greece, that word was interpreted as "love to knowledge" applied in any current academic field. Moreover, at present, the doctorate (aspirantura) in Armenia is based on the list of aspiring professions inherited from the Soviet Union, which is extremely detailed and coded not only by fields but also by sub-fields. The use of such a practice was aimed at grouping innovations in science according to narrow scientific directions, coding, recording, archiving and putting it into practice in the state of demand.

Indeed, nowadays, this practice should be considered inappropriate and not applicable. In our reality, the state is not the only beneficiary in the field of research,

and innovative demand is shaped not only from the "top" in a centralized manner in the knowledge market. Therefore, it is time to give up detailing both the coding and detailing of doctorate specializations. Moreover, sometimes, in the case of the thesis/dissertation defence, the experts and scientific councils find it difficult to group them according to the codes of related professions.

Training of professional skills gives some discussion in the field of doctoral studies about the availability and acquisition of graduate skills at the previous levels of higher education. It is assumed that the applicant in a specific area should already have the set of skills that will be fully applicable to doctoral studies and will be satisfying for the full realization of the graduate's professional qualifications.

### **Professional and Transferable skills**

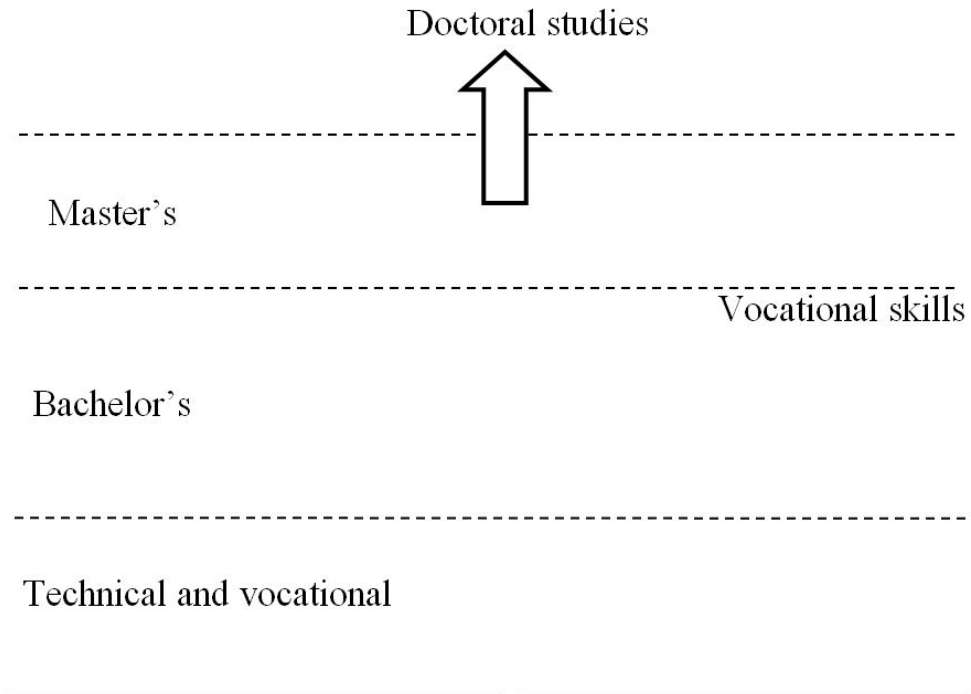
In our previous papers [3, 4], we have already discussed the need for education in a doctorate to develop the professional skills and abilities of the doctoral candidate. In this case, there is a question as to what additional skills the doctor/PhD needs, which he/she did not previously have at the Master's or Bachelor's level.

To answer this question, first, you need to understand the peculiarities of the professional skills program and why the Master's degree is the pre-qualification stage of doctoral studies. The thing is that without "master's pre-training" it would be difficult to obtain research, pedagogical or managerial skills in doctoral studies, as, first of all, the doctor-applicant should know them somehow and only then, bring in a creative approach to transferable skills.

A graduate of a third level higher education should be highly motivated in contrast to the Master's qualifications. At the same time, the acquisition of a specialist's skills is widened parallel to the increase of the educational level (see Figure 1). A doctorate graduate must have adequate professional skills in research, education, cooperation and teamwork, innovation, etc. and therefore should have the skills that can transfer from science/research to pedagogy/education or from pedagogy/education to leadership.

Thus, transferable skills are universal and are essential for all aspects of the doctor's professional realization. And this is the reason why doctoral students are primarily trained in transferable rather than vocational skills (Figure 1)

## TRANSFERABLE SKILLS



**Figure 1. The process of transferring skills at different degree levels**

The list and scope of the doctoral thesis/dissertations are different in universities, but in general, they are summarized in the following groups:

### **Problem-solving skills:**

- Definition of the problem and the solution curve;
- Generating creative ideas;
- Development of a wide range of information;
- Research source analysis;
- Propagation of scientific hypotheses.

### **Individual and leadership skills:**

- Organization of group discussions and decision-making;
- Self-assessment and self-organization skills;
- Grants and Grant Management Skills;
- Developing motivation environment for project implementation;
- Ensuring feedback and timely communication;
- Implementation of conflict skills in group work.

**Project management and organization:**

- Conducting uninterrupted implementation of the program;
- Implementing flexible managerial decisions in changing situations;
- Searching alternative financial sources;
- Harmonization of negotiation skills;
- Mapping of targeted access targets.

**Research Creative Skills:**

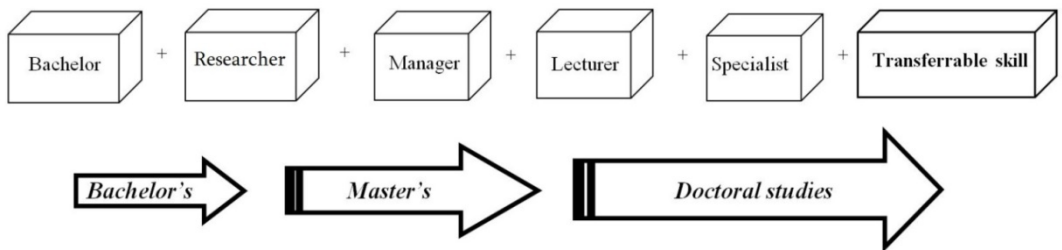
- Skills for developing and presenting scientific novelty,
- Development and presentation of innovative ideas and hypotheses;
- Skills in publications and publications in scientific circles;
- Uninterrupted development of research tools;
- The culture of participation in scientific and research debates.

**Working skills:**

- Undertaking guidance;
- Organization of effective work in the conditions of end-time and high-quality standards;
- Demonstration of ideas about the introduction of concepts and overcoming obstacles;
- Providing creative approaches to work duties;
- Conducting an in-depth analysis of the access to employment outcomes;
- Career management;
- Ensuring intellectual property protection;
- Maintaining copyright in inventions and rationalization proposals.

If we compare the professional skills of the doctor with the general professional skills of the person with the higher education presented in the previous paragraph, then it will become clear that the doctorate differs from the previous education levels by providing the graduate with the extracurricular skills (Figure 2), which form the basis of personality attributes such as:

- High level of self-governance;
- Create a high level of activity;
- The flexibility of decision making;
- Quality of research analyzes.



**Figure 2. Quality of Doctoral Qualifications: the formation process at the degrees of higher education**

The guideline for the competitiveness of vocational education should also be considered as the formation of creative thinking among students. The experience shows that the Bachelor's or Master's degree programs in Armenia are devoid of innovation. In some parts of the student and academic staff, mechanical perceptions of the educational process are still dominant when the student is mainly viewed as transferring knowledge through a lecture and then testing it during the exam.

Consequently, in this case, some of the faculty and student community still pursue an educational process, not as a process of thinking, but as a knowledge, a form of learning. However, within the capabilities of today's university graduate, not only professional knowledge but also the ability to manifest itself in creativity and innovation are highlighted.

It is important to investigate the awareness of teachers and students at the universities related to the necessity to enhance creativity within and by the academic community [5]. Therefore, today's educational programs are considered competitive, with the result that not only "academic" but also "creative skill" graduates. In this regard, particular emphasis should be placed on the student's not formal but productive individual work to develop creativity. This innovation is one of the requirements of the current Bologna process.

### **Career Development Management and Leadership**

The partial academic education of the employer is not a priority for the graduate. In addition to professional knowledge, dimensional emphasis is placed on balanced, oriented, well-behaved, communicative, timely and fundamental decisions in the workplace. Therefore, at present, universities are facing a challenge to revise the direction of providing educational services in such a way as to reinforce the employer-

HEI bridge and the dynamic changes taking place in the labor market by taking into account.

One of the peculiarities of education in a doctorate is the length of study. During the three or four-year doctoral training, substantial changes occur in the labour market, and the university student's curriculum is definitely "curtailed" during this period. HEIs should be interested in employers' involvement in education and should be motivated by the fact that graduates choose optimistic students to graduate with a job offer. The employer, being well-informed about the training process, should take an active part in not only improving the curriculum but also in the field of educational services. The possible ways of its implementation are to introduce the best students to encouragement scholarships, organize internships, and support teaching studios, learning centres, and laboratories.

On the other hand, employers gradually realize that it is more profitable to spend their share of resources in implementing educational programs in the HEI/universities rather than to go through the re-training of the postgraduates. Taking advantage of this situation, a doctorate graduate must work closely with employers to work immediately after graduation and receiving the PhD degree.

After receiving the Master's degree, the PhD applicant must be convinced that this particular speciality will be required in the labor market. In this regard, the current focus of the Bologna process focuses on the education of targeted learning outcomes when education is fully addressed to the labor market requirements.

Studies show that among the reasons for the unemployment in higher education in the EHEA countries, besides the economic crisis, an important reason can be the lack of skills and abilities of a specialist in the learning environment to meet the business requirements [6]. In this context, universities should strive to attain the learning outcomes of the skills and abilities that are required at the next levels of higher education.

The problem is that the postgraduate student cannot have a wide range of skills or a comprehensive frame of capacities, hence not being demanded by the employer. Practically there are few cases when a wide range of professional skills gained during education does not satisfy the employer because it is "overcrowded" and is not applicable in practice. It turns out that in this case, the PhD degree is "super-qualified" by employers, and as a result, they do not go to work. The study shows that the percentage of unemployed postgraduates from Western European universities, being "overqualified", is 14-35% [7].

In this regard, interesting solutions are offered by Swedish universities. Thus, the Doctorate of Stockholm Technological University is organized in two stages. Graduates of the first stage, studying for two years, receive a degree and can work in

research institutions serving the industrial market. However, if they want to teach and conduct research at universities, they must study in a doctorate for two more years, defend their dissertations, and have a PhD degree.

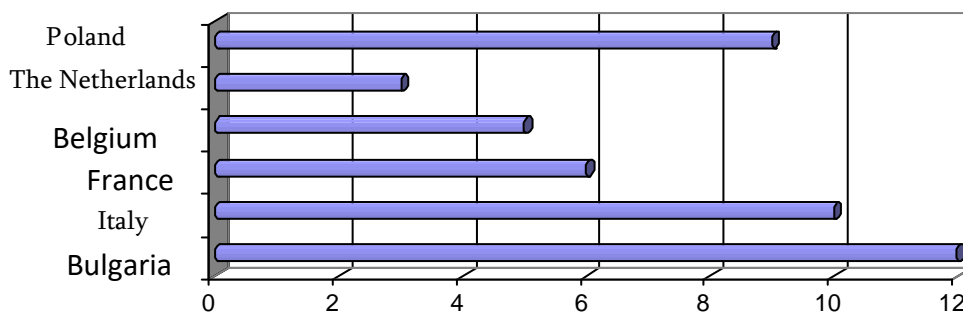
There is no such flexibility in the organization of labour-oriented doctoral studies in the Republic of Armenia. Moreover, according to official statistics, in the past few years, the highest number of unemployed persons has higher education. The level of their professional skills and capacities are rated "highly productive", but they simply do not get job offers by employers.

In this regard, it seems that despite some achievements of the Bologna Process in Armenia, the implemented reforms are mainly related to the structural characteristics of higher education and, in general, have not yet turned out to the content and quality of the educational programs. The fact that the education system generally remains "cut off" from the labor market and does not fully account for employers' demands. Professional education programs are often overwhelmingly focused on the skills and capabilities required for graduates to be taught in non-homogeneous subjects or do not include up-to-date items that would be developed the graduates' capacities to meet the employer's requirements.

The human factor is evident in the organization of the educational process. There are plenty of examples when there is enough information, opportunities, and students and professors do not use or want to use them. Consequently, universities should be urgently required to organize education based on outcomes in specific educational programs, clearly defining the scope of the subject and how it relates to the potential scientific skills of the doctoral candidate.

In this way, the curriculum will load "superfluous" items that overpower the curriculum, with new subjects as a consequence of the labor market. Targeting outcome results will greatly increase the performance of the reform in the higher education system of Armenia.

An important indicator is the duration of getting a job after graduating from the university, which is approximately is 4 months in the EHEA (Figure 3).





### **Figure 3. The duration of graduates' employment after graduating the university (months)**

Graduates of the third level higher education in the Republic of Armenia see their career growth in the university system, supplementing universities' researchers/professors and teaching staff. Only a small number of them continue their careers in scientific research institutes or government agencies after the dissertation defense. The reason is that the salary difference between the educational qualifications in our country is not so significant, and people with an academic degree prefer teaching.

However, graduates at the international level do not avoid working in the industrial market because employers estimate them by their leadership professional skills.

The emphasis on the importance of the leader is now integrated with the internal development of science. It is characteristic that most scientists necessarily include the understanding of the manager and the leader in their conclusions. According to the leading authors, the manager is effective only within the framework of the existing concepts; he can even improve the principles and rules, behavioural norms and standards of the given paradigm, but only the leader can change the paradigm to provide a transition and development. In the situations that require change, leaders succeed, not the managers.

According to traditional interpretations of "manager" and "leader", the first is the official head of the organization, relies heavily on its high position in the internal government pyramid, exercises legal levers of influence, and the latter is unofficial. It directs people through the reputation, virtuosity and respect they enjoy among the members of the organization, primarily of good-gracious leverage.

Consequently, a postgraduate student - PhD must demonstrate leadership skills in a working environment, directing the teamwork of large or small groups of employees to achieve effective outcomes. And if the traditional administrator guided the process in accordance with established organizational standards and norms, the doctor with a degree would show creative approaches here, trying to transform and develop the team management process, using the high quality of his profession.

### **Conclusion**

Thus, the efforts of leading universities to ensure the competitiveness of doctoral studies are not limited to ensuring the attractiveness of doctoral education. In the case of having a competitive doctorate, the science market is activated, scientific innovations

are addressed, are found in practical application by consumers, and significantly contribute to the country's socio-economic development.

Therefore, at present, conceptual changes in higher education must be made in Armenia, career management in all the levels must be improved.

Doctorate should not be seen as just a career development for a person. Receiving an academic degree, the doctoral candidate must bear a moral-psychological obligation for his career trajectory. The third level of higher education shapes a person both as an intellectual and public figure and as a scientist. If we manage our doctorate well, we will have good lecturers at universities and creative scientists at research institutions. Those who have obtained an academic degree will be able to easily introduce innovations both in the spheres of education/research and economic development of the country.

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ուղարկվել է գրախոսության 07.04.2021 թ., ընդունվել է տպագրության 12.04.2021  
թ.:

## COMPOUNDING IN THE WORK “ARMENIAN HISTORY” BY KIRAKOS GANGZAKETSI

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### **Abstract**

Various languages of the world have different word-formation. Depending on the stages of the language development, they may possess vivid or weakly displayed manifestations of word-formation patterns. The changes occurring in social life most of all influence the word stock of any language. Meanwhile, it is worth mentioning that word-formation models are stable; that is to say, both distinct words and word formation patterns may be transferred from one stage of the language to another.

The present paper touches upon the phenomenon of compounding and its peculiarities in the work of ‘History of Armenia’ by an Armenian historian of the 13th century Kirakos Gandzaketsi. The research covers in detail the approaches to patterns of compounding existent in linguistic literature, as well as all the types of compounds presented in the work of the historian, the compounding patterns with root words and linking vowels, any possible combinations of component stems belonging to different parts of speech.

Having analyzed the observations on the word-formation patterns of compounds in the researched work, we can conclude that they stand out due to their diversity. However, some disproportion in terms of their functional characteristics can be observed. There are patterns with the help of which tens of words can be formed, and there are patterns with only one example. Based on a comprehensive analysis of compounding peculiarities in Old Armenian and Middle Armenian, namely in the studied work, we can unequivocally state that the historian, being a representative of the Middle Armenian literature, mostly used word formation patterns of Old Armenian, applying all the types of compounding and various combinations of root words in his work.

### **Keywords and phrases**

Kirakos Gandzaketsi, 13th century, “History of the Armenians”, compounding, word formation.

**ԲԱՌԱԲԱՐԴՈՒՄԸ ԿԻՐԱԿՈՍ ԳԱՆՁԱԿԵՑՈՒ «ՊԱՏՄՈՒԹԻՒՆ ՀԱՅՈՑ»  
ԵՐԿՈՒՄ**

**ԼԻԼԻԹ ՀԱԿՈԲՅԱՆ**

Հայաստանի պետական տնտեսագիտական համալսարանի լեզուների ամբիոնի  
դասախոս

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**Համառոտագիր**

Աշխարհի տարբեր լեզուներ ունեն բառակազմական տարբեր միջոցներ, որոնք լեզվի զարգացման տարբեր փուլերում կարող են ունենալ բառակազմական օրինաչափությունների ընդգծված կամ թույլ արտահայտված դրսևորումներ: Հասարակական կյանքում կատարվող փոփոխությունները ամենից շատ ներգործություն են ունենում բառապաշարի վրա: Միաժամանակ հարկ է նշել, որ բառակազմական կաղապարները կայուն են. և՛ առանձին բառերը, և՛ բառակազմական կաղապարները կարող են փոխանցվել լեզվի մի փուլից մյուսին:

Սույն հոդվածում անդրադառնում ենք բառաբարդմանը, նրա առանձնահատկություններին և դրանց արտահայտությանը 13-րդ դարի հայ նշանավոր պատմիչ Կ. Գանձակեցու «Պատմութիւն հայոց» երկում: Հանգամանորեն ներկայացվում են բառակազմական տարբեր օրինաչափությունների վերաբերյալ լեզվաբանական գրականության մեջ առկա մոտեցումները, ինչպես նաև պատմիչի երկում վկայված բարդությունների բոլոր տեսակները, արմատի և հոդակապի տարբեր հարաբերակցությամբ բառակազմական մի շարք կաղապարներ, տարբեր խոսքի մասերի պատկանող սկզբնահիմքերի հնարավոր զուգորդություններ:

Ամփոփելով ուսումնասիրվող երկում հանդիպող բարդ բառերի բառակազմական կաղապարների մասին դիտարկումները՝ կարող ենք արձանագրել, որ դրանք աչքի են ընկնում իրենց բազմազանությամբ, սակայն ունեն գործառական խիստ անհամաչափ բեռնվածություն: Կան կաղապարներ, որոնցով մի քանի տասնյակ բառեր են վկայված, և կան մեկ օրինակով կաղապարներ: Ծանոթանալով բառաբարդման առանձնահատկություններին գրաբարում ու միջին հայերենում, դրանք դիտարկելով ուսումնասիրվող երկում՝ կարող ենք վստահաբար պնդել, որ պատմիչը, լինելով հանդերձ միջինհայերենյան շրջանի մատենագրության ներկայացուցիչ, առավելապես կիրառել է հին հայերենի բառակազմական օրինաչափությունները՝ իր երկում կիրառելով բարդությունների բոլոր տեսակները և արմատների ամենաբազմազան զուգորդություններով օրինակներ:

**Բանալի բառեր և բառակապակցություններ**

Կիրակոս Գանձակեցի, 13-րդ դար, «Պատմութիւն հայոց», բարդություններ, բառակազմություն:

# СЛОВОСЛОЖЕНИЕ В ПРОИЗВЕДЕНИИ КИРАКОСА ГАНДЗАКЕЦИ "ИСТОРИЯ АРМЕНИИ"

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## **Аннотация**

В разных языках мира существуют различные словообразовательные средства, которые на различных этапах развития языка могут иметь ярко выраженные или слабо выраженные проявления словообразовательных закономерностей. Изменения в общественной жизни больше всего оказывают влияние на словарный запас. При этом следует отметить, что словообразовательные модели устойчивы. Отдельные слова и модели словообразования можно переносить с одного уровня языка на другой.

В данной статье мы обращаемся к словосложению, его особенностям и их отражению в книге выдающегося армянского историка 13-го века Киракоса Гандзакеци «История Армении». Подробно представлены подходы, имеющиеся в лингвистической литературе по различным словообразовательным закономерностям, а также все виды сложений в словообразовании, засвидетельствованных в книге историка, ряд словообразовательных моделей с различным соотношением корня и соединительного гласного, возможные комбинации основ, принадлежащих к разным частям речи.

Суммируя исследованные в произведении наблюдения над словообразовательными моделями сложных слов, можно констатировать, что они отличаются своим разнообразием, но имеют непропорциональную функциональную нагрузку. Есть модели, на основе которых засвидетельствовано несколько десятков слов, и есть модели с одним примером. Ознакомившись с особенностями словообразования в габаре и среднем армянском языке, рассматривая их в исследуемом произведении, можем с уверенностью утверждать, что историк, будучи представителем летописания среднеармянского периода, преимущественно применил словообразовательные закономерности древнего армянского языка, в свою очередь, применяя в произведении все виды сложений и примеры с самыми разнообразными сочетаниями корней.

## **Ключевые слова и фразы**

Киракос Гандзакеци, историк 13-го века, «История Армении», словосложение, словообразование.

## Introduction

Various languages of the world have different word-formation means that, depending on the stages of the language development, they may possess vivid or weakly displayed manifestations of word-formation patterns.

The changes occurring in social life influence the most the word stock of any language. Meanwhile, it is worth mentioning that word-formation models are stable; that is to say, both distinct words and word formation patterns may be transferred from one stage of the language to another.

There are two main forms of word formation: compounding and affixation. According to the structural features, the compounds caused by word-formation can be comparative, relative or analytical. As it is known, there are two types of comparative compounds: added and natural. The 13th-century historian Kirakos Gandzaketsi's "History of Armenia" largely contains all the types mentioned above of compounds, and the word-formation patterns have mainly penetrated from Grabar.

Considering that our aim is to present the basic word-formation patterns in Gandzaketsi's work, we do not touch upon forming individual words, the internal form of words, or the degree of merging of components.

As we know, according to the method of adding the component-forming bases, the compounds can be created with the help of a linking vowel and with the method of juxtaposition [6, p. 179]. The comparative compounds evidenced in Gandzaketsi's work are presented in this paper in those two groups: with a linking vowel and juxtaposed.

H. Acharyan connects the origin of the linking vowel with thematic vowels; he calls it the vowel of the conjugation stem, in contrast to Meyer's approach, according to which the linking vowel a is a grammatical borrowing caused by the influence of words borrowed from Persian [4, p. 131].

M. Abegyan connects the origin of the linking vowel a with the vowel of root ending that is to say word stem of several specific words (tgha, erekha). The latter eventually dropped out of these words; it has survived only in the composition of compound words, which serves as a powerful element connecting two roots. Later, it was used in new compounds and turned into a linking vowel [1, p. 154]. The origin of the linking vowel is similarly explained by A. Sukiasyan [10, p. 247].

E. Agayan defines the linking vowel a as a functionally meaningless form, which does not convey any semantic change in the compounds consisting of the same components created with a linking vowel or with a juxtaposition [2, p. 262].

According to G. Jahukian, the linking vowel a is the result of the further development and transformation of Indo-European thematic bases [7, pp. 239-248]. According to him, in the pre-development period of the Armenian language, the vowel a

was the basic element for characterizing the entire conjugation of the word. In the nominative case, it has been preserved only in the composition of compounds, perceived as a linking vowel and applied on a non-a basis [9, p. 37]. In old Armenian, the components of compounds were combined in their usual basic form [8, pp. 246-247]. That is to say, the ancient compounds are the words not having a linking vowel, or they have the first component on the basis of i/a, from which a has been separated and used as a linking vowel. It is worth mentioning that other vowels also formed vowel nests: e, i, o, u (yerkotasan, hngetakan, tanuter, etc.). It is, of course, clear that this does not apply to the e resulting from the change in the sound i + a. These vowels are not linking vowels, but “vocal nests preserved from ancient times, which proves that the linking vowel was originally a nest vowel” [2, p. 263]. However, it should be noted that the vowel a is the most widespread in old Armenian as a linking vowel, which is already perceived as an independent unit.

### The results of the research

Let us provide the compounds with a linking vowel from Kirakos Gandzaketsi's work “History of Armenia”.

SjS<sup>18</sup> - մեծապայծառ/metsapaytsar (196), ձիատուրակ/dziatoprak (60), օտարացեղ/otaratsegh (378), մեծածայն/metsadzayn (180), մեծահանդէս/metsahandes (270), դաշտավայր/dashtavayr (203), քաղաքագիւղ/qaghaqagyugh (282), սիւնածն/syuandzev (398), մայրաքաղաք/mayraqaghaq (254)

S jS - բազմալոյս/bazmaloy (16), բազմահանճար/bazmahanchar (6), բազմամարդ/bazmamard (396), տաճկահաւատ/tachkahavat (373), թրքաժողով/trqajoghov (71)

SjS<sup>f</sup> - ականատես/akanates (384), ամենագէտ/amenaget (383), աշխարհակալ/ashkharhakal (394), խոնարհամիտ/khonarhamit (392), չարախորհ/charakhorh (38), ողորմատես/voghormates (50), մեծատուր/metsatur (232), դիւրընթաց/dyuryntac (303), լայնատարած/laynatarac (88), ընծայաբեր/yntsayaber (85), հրամանաբեր/hramanaber (170), խորշակահար/khorshakahar (293), բեռնակիր/bernakir (173), շրջակայ/shrjaka (187), նոսխասէր/vosokhaser (33), փափագատես/phaphagates (89)

S jS<sup>f</sup> - քննասէր/qnnaser (3), պատմագիր/patmagir (6), քաղցրախօս/khaghtsrakhos (27), ամրափակ/amraphak (27), տիրաննեց/tiraneng (15), դիմադարձ/dimadardz (18), լուսատու/lusatu (27)

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<sup>18</sup> In the mentioned patterns, S is a base with a changed vowel, j is a linking vowel, S<sup>f</sup> is a base with a grammatical form, SjS is a compound created with reduplication, c is a conjunction, p is a preposition.

SjS - բարեպաշտ/barepasht (16), բարեհամ/bareham (21), բարեկամ/barekam (150), Ոսկեբերան/Voskeberan (112)

There are words that do not have the vowel *i* of the final syllable, but they may show similar phonetic changes in compounds. Such structures are very common in Middle Armenian [3, p. 170].

SjS - կերակուր/kerakur (386)

SjS - մեծամեծ/metsamets (374)

In the work of the historian, there are examples in which the function of the linking vowel is performed by conjunctions and prepositions. In linguistic literature, such components are called connecting and juxtaposed compounds. It is essential to mention that it was a distinctive feature of the word-formation in Grabar [5, p. 114].

According to G. Jahukyan, the compounds with conjunctions u and e are the types of coordinating compounds. He labels them additional elements and notes that this type of compounds is different from the other, because the components that make up them and those compounds belong to the same part of the speech forming a noun compound with noun components and an adjective compound with adjectives [9, p. 218].

In Gandzaketsy's work, the conjunctions u, e were used as linking vowels.

ScS - այբուբեն/aybuben (27), այրուձի/ayrudzi (94), ութևտասն/utievtsan (198)

ScS - մի և կէս/mi yev kes (197), քսան և հինգ/qsan yev hing (198), հինգ հարիւր քսան և ութ/hing haryur qsan yev ut (199)

In the work that we have studied, there is a large number of examples of reduplicative compounds, in which between the components or in the beginning of the compound there is a preposition. This means that those compounds were created by repeating the same component, and “ի”, “զ”, “ընդ”, “ըստ” prepositions functioned as connecting-vowels. The components were written both together and separately.

SpS - օր ըստ օրէ/or yst ore (117), փոյթ ընդ փոյթ/phuit ynd phuit (202), ընդ ժամանակս ժամանակս/ynd jamanaks jamanaks (15), ի տեղիս տեղիս/l teghis teghis (208), ի կերպս կերպս/l kerps kerps (227) etc.

In all the stages of the development of Armenian linking vowel compounds were a lot. It is important to mention that linking vowels were also used in a number of prefixed and suffixed words.

In the studied work, we came across very few juxtaposed compounds (119 words). Let us introduce them according to the feature of a stem component having an initial vowel or initial consonant.

Juxtaposed compounds with a stem component having an initial vowel: այլազգ/aylzag (3), ողջանդամ/voghjandam (390), նորընծա/noryntsa (200), մեծիմաստն/metsimastn (5), դիւրընթաց/dyuryntats (303), ձեռնարար/dzernarar (60), քարայր/qarayr (243), շուրջան/shurjar (247) etc.



Juxtaposed compounds with a stem component having an initial consonant: արևմուտ/arevmut (41), բուրվառ/burvar (306), ձեռնհաս/dzernhas (4), մոգպետ/mogpet (34), օրէնսդիր/orensdir (60), Կապուտքար/Kaputqar (84), ձեռնտու/dzerntu (216) etc.

In juxtaposed compounds, the type made with a verb and with a word that functions as a verb attribute is very common. In Gandzketsy's work, the existing large number of juxtaposed verbs (137 words) are juxtapositions created with **noun + verb** pattern. Let us introduce some of them.

Հրաման ետ/hraman yet (376), ետ փառս/yet phars (14), հրկէզ եղեալ/hrkez egheal (22), երկիր պագանէր/yerkir paganer (397), ձայն արկեալ/dzayn arkeal (42), ծաղր արարին/tsaghr ararin (52), այց արար/ayts arar (39), գերի վարել/geri varel (207), ահ արկ/ah ark (313), ողջոյն ետ/voghjuin yet (64) etc.

There are also examples with **adjective+verb** construction in the work, but in comparison to noun + verb construction, they don't make up a large number (24 words). Some examples from the original work are անջինջ լինել/andzindj linel (8), յայտնի եղև/haytni yeghev (14), անյայտ լինէր/anhayt liner (15), հմուտ լինել/hmut linel (207), ուրախ արար/urakh arar (109) etc.

The comparative verbs compared to juxtaposed verbs do not make up a large number in K. Gandzaketsi's work "History of Armenia". In Grabar, a verbal in the past tense is involved in the formation of the comparative verb. In this case, the first of the components is usually a verbal in the past tense, and the second is the finite form of the verb. In the previously mentioned work, a large number of comparative verbs is made with that same pattern. Although it is necessary to mention that in the same work there are comparative verbs that are not made with that construction. Let us provide certain examples: երթեալ մտանէր/verteal mtaner (379), ելեալ գնացաք/yeleal gnatsaq (329), տարեալ եմոյձ/tareal ymoyts (176), առեալ տարան/areal taran (181), առեալ բերին/areal berin (181), ելեալ հանիցեն/yekeal hanitsen (188), ցանեալ ցրուեաց/tsaneal tsveats (194), etc. But it is necessary to mention that in the same work, there are examples of comparative verbs which were created based not on this pattern. Here are some of them. Եկին իջին/yekin ijin (203), անցին գնացին/antsin gnatsin (204), երթալ առնուլ/yertal arnul (206), երթեալ վառեալ/verteal vareal (180) etc.

Comparative verbs mainly form **neutral+neutral** or **intransitive+intransitive** constructions, that is to say, they can be claimed to be homogeneous, as խաղաղին գնացին/khaghatsin gnatsin (292), ելեալ գնացաք/yeleal gnatsaq (329), երթեալ մտանէր/verteal mtaner (379), տարեալ ամուսնացոյց/tareal amusnatsoyts (189), առեալ բերին/areal berin (181) etc.

However, in K. Gandzaketsi's work there are also some examples of comparative verbs that are of different genders combined with **neutral + intransitive** and **intransitive + neutral** verbs, as եկեալ հանիցեն/yekeal hanitsen (188), աճապարեալ ժողովեաց/achapareal joghoveats (161), տարեալ նստուցին/tareal nstutsin (117), ջարդեալ մեռալ/jardeal merav (102), etc.

Nominal juxtaposed compounds are formed with nouns, adjectives, adverbs, numerals, conjunctions and modal verbs. K. Gandzaketsi does not use many nominal reduplicative juxtapositions in his work (17 words). In the examples, the components of reduplicative compounds are represented by **noun+noun** and **adjective + adjective** patterns according to the parts of speech they form, for example: ազգաց ազգաց/azgats azgats (27), կողմանս կողմանս/koghmans koghmans (234), սակաւ սակաւ/sakav sakav (237), անդամ անդամ/andam andam (257), ամի ամի/ami ami (269), ճշմարիտ ճշմարտի/tshmarit tshmarti (332), անտեսանելի անտեսանելի/antesaneli antesanelvoin (332) etc.

In Armenian, the pattern of composing a new word by reduplicating the same component or complicating the root by itself has always been viable. With the very pattern, adverbs have been formed from nouns.

Let us consider the possible combinations of components belonging to different parts of speech.

According to the parts of speech, the generating and constituting bases of the selected real compounds are presented by the following patterns:

a. Nouns and adjectives are formed with the structure **noun + noun**. In this structure, the noun components are in a syntactic relation of the modifier-modified and the determiner-determinant with respect to each other. For example, քահանայապետ/ (18), մարդամահ/ (40), ձիատոպրակ/dziatoprak (60), թրքաժողով/trqajoghov (71), քարայր/qarayr (178), դաշտավայր/dashtavayr (203), քաղաքագիւղ/qaghaqagyugh (282) etc.

b. Adjectives (sometimes even nouns) are mainly formed with the **noun + verb** structure, as բուրվառ/burvar (306), ոսիխասէր/voshokhaser (33), փափազատես/phaphagates (89), ընծայաբեր/yntsayaber (85), հրամանաբեր/hramanaber (170), խորշակահար/khorshakaber (293), բեռնակիր/bernakir (173) etc.

c. Adjectives are mainly formed with the structure **adjective + noun** with a determiner-determinant syntactic relation of components: ուղղափառ/ughghaphar (11), բարեհամ/bareham (21), երկարոգի/yerkarogi (26), քաջաբան/qajaban (51), բոկոտն/bokotn (81), մեծածայն/metsadzayn (180), մեծահանդէս/metsahandes (270) etc.

d. There is an equivalent relation between the components of an **adjective + adjective** structure; hence - adjectives are formed. In the studied work, there are 3 examples with this structure. Those are ամրափակ/amraphak (27), մեծամեծ/metsamets (374), մեծապայծառ/ metsapaitsar (77).

e. The components of the compounds formed with the structure **adjective + verb** are adverbially related to each other, and the whole composition is an adjective in the sense of adverbial participles. Let us introduce some examples with that structure: քաղցրախոս/khaghtsrakhos (27), արդարադատ/ardaradat (105), բարեկամ/barekam (150), աղքատասէր/aghqataser (183), մեծատուր/metsatur (232), դիւրընթաց/dyuryntats (303), լայնատարած/lainatarats (88), etc.

f. The components of the compounds formed with the structure **number + noun** form adjectives and are in determiner-determinant relation to each other. For example, միահանդերձ/miahanderdz (81), միատարր/miatar (136), միափոր/miaphor (182), հազարապէտ/hazarapet (203).

g. There is only one example of a compound formed with the structure **adverb + noun** in the work of Gandzaketsi: արագաթև/aragatev (160).

h. In the above-mentioned work, there are also examples of the structure **adverb + verb**, though there are not many. Here are some of them: շրջակայ/shrjakai (187), արագատես/aragates (271), առաջապահ/arajapah (282), գաղտնագնաց/gaghtnagnats (252), դժուարիմաց/dzvarimats (121), ուշաբարձ/ushabarts (296), etc.

A number of juxtaposed compounds (76 words) are also used in the work of the 13th-century historian. Here are some of those: այնուհետև/aynuhetev (211), ամենայն/amenayn (4), այսկոյս/ayskoys (374), այնժամ/aynjam (31), այսօր/ayzor (200), որչափ/vorchap (177), որքան/vorqan (280), թէպէտ/tepet (32), զհարդ/zhard (142), միայն/miayn (21), միգուցէ/migutse (8), մինչև/minchev (57), յորժամ/horjam (372), որպեսզի/vorpeszi (125), քանզի/qanzi (179), etc.

## Conclusion

Having analyzed the observations on the word-formation patterns of compounds in the work of 'History of Armenia' by an Armenian historian of the 13th century Kirakos Gandzaketsi, we can conclude that they stand out due to their diversity. However, some disproportion in terms of their functional characteristics can be observed. There are patterns with the help of which tens of words can be formed, and there are patterns with only one example. Based on a comprehensive analysis of compounding peculiarities in Old Armenian and Middle Armenian, namely in the studied work, we can unequivocally state that the historian, being a representative of the Middle Armenian literature, mostly used word formation patterns of Old Armenian, applying all the types of compounding and various combinations of root words in his work.

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թ.:

## THE TRANSFORMATION OF A YOUNG FAMILY IN MODERN ARMENIAN SOCIETY

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### **Abstract**

This article is devoted to the young family transformation of the contemporary Armenian community along with global economic influences, the causes and potential solutions of educational problems where the author has stressed the family organization as the key cell of society as a responsible for the mechanism of the formulation of an individual.

The modern family is going through a difficult period of its development. The young family firstly needs the support of the state. The scientific works devoted to the study of the family problems and family relationship, however, is not sufficient, as the institution of the family is different in different periods, as well as the needs and the mechanisms of satisfaction.

Based on the analysis of various educational structures, the author concludes that the family creates the foundations of ethical schooling and future youth and family formation development.

Monitoring different aspects of socialization of young people, which have a significant impact on the person formation, the author suggests using complex attitude, revealing the motivation and main issues for forming a family. Besides family, the state also takes responsibility. One should prove the quote: “solid family, strong motherland”.

### **Keywords and phrases**

Family, youth, family upbringing, national traditions, globalization, communication, socialization.

**ԵՐԻՏԱՍԱՐԴ ԸՆՏԱՆԻՔԻ ՓՈԽԱԿԵՐՊՈՒՄԸ ԺԱՄԱՆԱԿԱԿԻՑ ՀԱՅ  
ՀԱՍԱՐԱԿՈՒԹՅՈՒՆՈՒՄ**

**ՄԱՐԻԱՄ ՄԱՐԿՈՍՅԱՆ**

- ՀՀ ոստիկանության կրթահամալիրի ուսումնական գործընթացի կազմակերպման  
և վերահսկման բաժնի տեսուչ, ոստիկանության լեյտենանտ
- ՀՀ ԳԱԱ փիլիսոփայության, սոցիոլոգիայի և իրավունքի ինստիտուտի հայցորդ  
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**Համառոտագիր**

Հոդվածը նվիրված է ընտանիքի վերափոխման, ընտանեկան խնդիրների պատճառների և ժամանակակից հայ հասարակության մեջ համաշխարհային տնտեսական գործընթացների արդյունքում առաջացած հնարավոր խնդիրների ուսումնասիրությանը, ինչպես նաև դրանց լուծման հնարավոր ուղիներին: Ժամանակակից ընտանիքն անցնում է իր զարգացման դժվարին շրջանը: Երիտասարդ ընտանիքը հենց նա է, որը առաջին հերթին պետության ուշադրության և աջակցության կարիքն ունի: Ընտանիքին և ընտանեկան հարաբերությունների հիմնախնդիրների ուսումնասիրություններին նվիրված գիտական աշխատանքները, այնուամենայնիվ, բավարար չեն, քանզի տարբեր ժամանակներում ընտանիքի ինստիտուտը տարբեր է, ինչպես նաև տարբեր են պահանջները և բավարարման մեխանիզմները:

Հիմնվելով դաստիարակության տարբեր համակարգերի վերլուծության վրա՝ հեղինակը գալիս է այն եզրակացության, որ ռացիոնալ դաստիարակության միջոցով հնարավոր է ձևավորել կայուն ընտանիք: Հաշվի առնելով երիտասարդ սերնդի սոցիալականացման տարբեր ասպեկտներ, որոնք որոշիչ ազդեցություն են ունենում անհատի ձևավորման վրա, հեղինակն առաջարկում է կիրառել ինտեգրված մոտեցում, որը բացահայտում է երիտասարդների՝ ընտանիք կազմելու դրդապատճառները, որի համար պատասխանատու է պետությունը. այնդման հաստատումն է. «Ամուր ընտանիք, ուժեղ հայրենիք»:

**Բանալի բառեր և բառակապակցություններ**

Ընտանիք, երիտասարդություն, ընտանեկան դաստիարակություն, ազգային ավանդույթներ, գլոբալացում, հաղորդակցում, սոցիալականացում:

# ТРАНСФОРМАЦИЯ МОЛОДОЙ СЕМЬИ В СОВРЕМЕННОМ АРМЯНСКОМ ОБЩЕСТВЕ

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## **Аннотация**

Статья посвящена изучению трансформации семьи, причин семейных проблем и возможных проблем в современном армянском обществе, обусловленных мировыми экономическими процессами, а также возможных путей их решения. Современная семья проходит сложный период своего развития.

Молодая семья, в первую очередь, нуждается в поддержке государства. Однако научных работ, посвященных изучению семейных проблем и семейных отношений недостаточно, поскольку институт семьи в разный период времени разный, как и потребности и механизмы удовлетворения.

На основе анализа различных систем воспитания автор приходит к выводу, что с помощью рационального воспитания возможно формирование семьи молодого человека. Рассматривая различные аспекты социализации подрастающего поколения, оказывающие решающее влияние на формирование личности, автор предлагает применить комплексный подход, раскрывающий мотивацию молодежи к формированию семьи, за которую отвечает государство, подтверждая высказывание «Сильная семья - сильная родина».

## **Ключевые слова и фразы**

Семья, молодежь, семейное воспитания, национальные традиции, глобализация, общение, социализация.

## **Introduction**

In order to grasp the whole image of the contemporary Armenian family, the complexities and characteristics of the family formation have to be understood in the first place. Global trends make it necessary to examine the family's structure and forms. Business is continuously evolving as a system of social relations. There is a hypothesis in Western sociology, which suggests that modes of social relations, including crises, are

social regulators. [1] It has all led to changes in society, politics and economic conditions. The transformation process results in major changes, the belief structure of each step. Consequently, in culture, mutually opposing orientations occur only where it is possible to address the issue by universal consent. [2] The family is seen both as a small social community and a social entity in every society. As a small community, it satisfies people's personal interests as a socially relevant institution. The Armenian family system was historical and multi-dimensional traditionally. In the family, there was initially a separation of the roles of men and women; the major role of the family was a man and the woman engaged in family business. The legendary French sociologist Emile Durkheim argued the separation of labour between the two sexes as a means of marital unity in the household. [3]

Changes to the nature of the family influence not just the family but also society's way of life. In our culture, parents have significant social influence over their children, particularly girls, unlike young people in European countries.

Supervision plays a decisive role in shaping the concept for a family marital paradigm of the above. However, the family institution varies with changes in socio-economic circumstances, however solid the national pillars are. In order to research family shifts linked to social and socio-economic systems, the definition of "social organization" needs to be analyzed. The family is a structure that regulates relations between individuals in the spouses of premarital, sexual and reproductive spheres as a social institution for reproducing the population. However, it is closely related to other socially active organizations. Political and social institutions are mutually affected by the successful performance of their duties. The Armenian Apostolic Church and the National Army are the most trusted organizations in Armenia. This has been consistently illustrated by sociological studies carried out for at least the past eight years. The Center for Youth Action in Armenia's study was no exception where 91% of the young Armenians trusted in the Armenian Apostolic Church, and 87% were trusted by the Republic of Armenia's Armed Forces. [4]

The socio-demographic features of the person are typically employed in applied sociological research: gender, age, employment, health, jobs, marital status, children, nationality. All these features help us to get an understanding of today's youth's most dynamic positions: 'To control his or her actions, to perform social normal functions and to recognize potential breaches of contact with nature, it is important to research the role of individuals in cultural systems': [5]

The new youth value culture is hard to identify with the previous generation value system. If a person raised his child in ancient times so that he could hunt, defend himself, and then hunting is a kind of hobby in the modern world. Furthermore, the individual tries to raise a generation who will find their place in the changing world after



entering life. Thus, upbringing and education in the changed Armenian community family are priorities. This is why the study of family education in Armenian culture is a priority.

From generation to generation, the knowledge of the older generation and family rituals are transmitted. Thus, to resolve the challenges caused by society changes, the culture of our ancestors is significant. The advancement of information technology makes it a priority for the rising generation to gain socio-cultural security and be successfully applied for moral education.

The Republic of Armenia cannot prohibit world systems from affecting them. To control his activities, to humanize culture, serve the usual functions of society, and identify potential infringement of interactions with nature is essential to research the role of the personality in a changing society. The conventional family was an organization that fully addressed the issues of socialization of children. Today, a new family form, the "modern" family, has replaced the conventional family. The increased nuclear family, decreased childbearing, older marriage age, declining marital status, rise in divorces and so on are the peculiarities of modern families.

### Theoretical and methodological basis

In this article, we presented the statistics of marriage, divorce and birth rate in the Republic of Armenia for 2006-2016.

**Table 1 registered marriages and divorces in the Republic of Armenia and the regions (2006-2016) [6]**

RA		Marri	Divorce
		age	
RA	2006	16,887	2797
	2016	16,294	3648
Lori region	2006	1420	379
	2016	1106	538
Shirak region	2006	1312	179
	2016	1048	241

**Table 2 Registered birth rate in the Republic of Armenia and the regions (2009-2019) [7]**

<b>Birth rate</b>	<b>2009թ.</b>	<b>2019թ.</b>
<b>RA</b>	44413	36041
<b>Lori Region</b>	3471	2567
<b>Shirak region</b>	3991	2834

The number of weddings has dropped, and the number of divorces has risen, as can be seen from the tables. A drop in marriage numbers is clear, which involves a separate and detailed analysis of cause and effect relationships. The reduction in marriages registered by young people, according to our study, is primarily due to socio-economic factors. Furthermore, the propensity of young people to marry at a later age should also be noted. There are also explanations for this. For men, the issue is the lack of an apartment, and for women, marriage postponement is related to research and work processes. Concerning the reduction in childbirth, it should be remembered that young girls and women want children poorer than men. [4]

A large number of incomplete families were born following the 1988 earthquake in Armenia, particularly following the large-scale emigration in the 1990s. The family father, who had been working overseas, lived abroad, and the mother lived with the children in Armenia; there were far-off relatives. Armenian society has to meet the demands of the contemporary world and find ways to live a harmonious, healthy family, from economic to mental. The shifting mood thought and behaviour of young people is evidence of the new young family. [8]

### **Methods**

Sociological research was required to find the changes in the typical Armenian family. The survey was selected as the instrument for analysis. The survey was attended by 140 young people (70 men, 70 women). As well as 70 elderly representatives. The division between the youth and the elderly aims to figure out what changed the Armenian traditional family's structure and moral code. Based on the following criteria, the participants were selected as follows:

1. Gender and age for young people (18-35 years) and older representatives (55-60 years)
2. The community is urban and rural.

## **Results and Discussion**

According to the survey findings, 85 young people agree that life's primary aim is to give their parents a reason to be proud of themselves. The Armenians were marked by patriotism from ancient times. In the past, young people married without knowing their future husband or wife; they married against their wishes to please their parents. 55 of the 70 young men surveyed said they would like to live with their parents if they wished. Their observation was that aside from social life, the primary justification for staying with their parents was due to their parent's wellbeing. Although the views of the girls surveyed differed considerably, 39 of 70 girls surveyed said that they did not want to live with the parents of their husbands. They did not express a wish to live with their own parents in case they were not married. This obviously indicates that the beliefs of the present girls are shifting and liberalizing. At that point, the older generation did not even believe in such a situation. The disparities in women's and men's gender positions in rural and urban societies were particularly obvious. The position of men in the family as a leader remains a priority in rural areas. Historically it came from ancient times. It shows that the conventional mentality of the rural regions is still very rarely maintained.

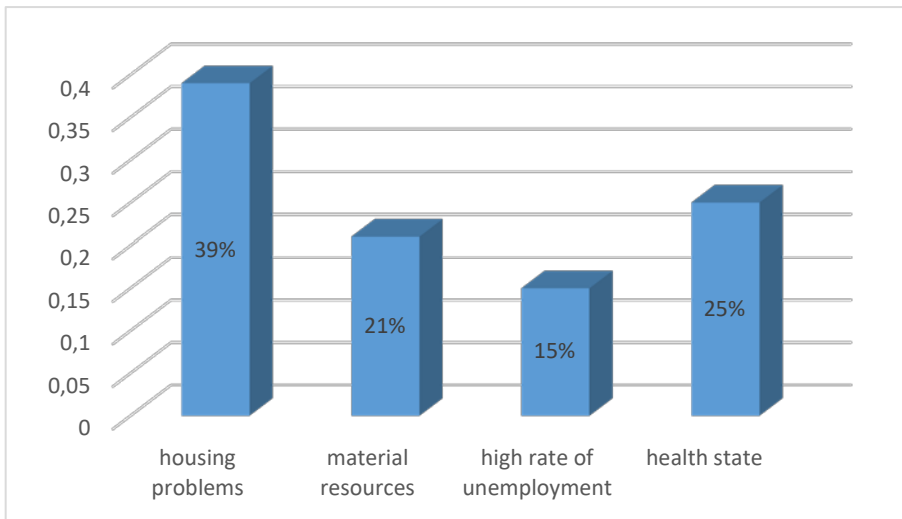
Note that women in the older generation are generally involved in family relations, with correspondence being ranked as 2 (scale 1 to 5) in rural communities, as given below:

1. Not at all
2. Little
3. Partially
4. More
5. Absolutely

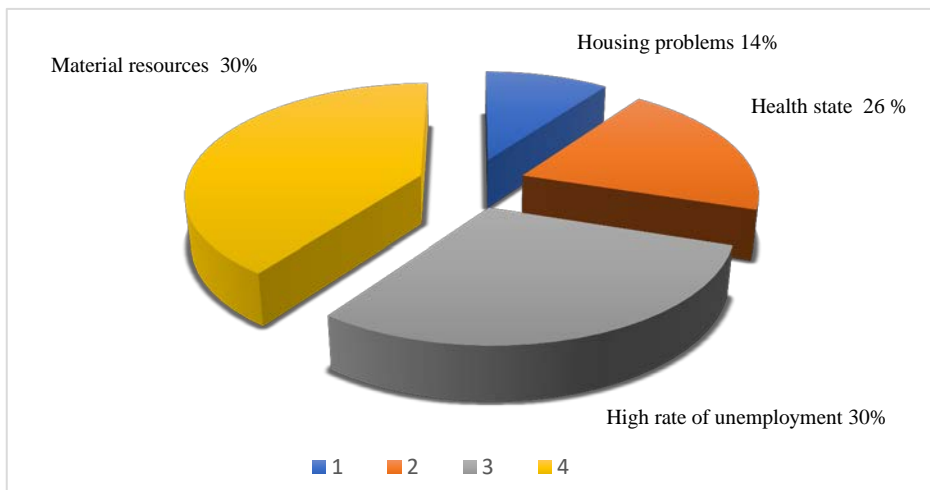
Today, young people living in the city (in the range of 1-5) have chosen 4 ranges, respectively, some of them 5 ranges. It turns out that today we accept the increasing role of women and their participation in family affairs. Sadly, the tendency to have fewer children is one of the biggest concerns of a young family today. Of the 140, they shared the intention to have 1, seldom 2 children in the future (84 young people). This was due to poor social conditions. By the way, all the other young people (56 young people) from rural areas have suggested that they like two, three or four kids or even more. Looking back, we are persuaded that birth was higher among previous generations. And if the socio-economic circumstances were worse it could therefore be inferred that the

correlation between a birth rate pattern and socio-economic circumstances can only be false. And we can draw a strong inference from this that family research would concentrate on small families in rural areas since if something needs to be changed, it should be changed in the rural families. There is some preservation of the typical family-style. Therefore, it is becoming more popular to look at the challenges of young families in rural areas. And in both cities and villages, the issue of what keeps young people today from having a lot of children is posed. (Tables 3 and 4)

**Table 3 Reasons for not having a child/children (Lori region, Arevashogh village)**



**Table 4 Reasons for not having a child / children (Yerevan, Avan administrative district)**



Answers attributed concerns of young families to housing and unemployment issues. We may say that these two reasons have a definitive effect on young people's will to marry and have children. There is little need here for the position and protection of the state. Unemployment results in depleting our society's mental and physical capacity, which is, first of all, a slap at our national security, economic and demographic indicators. This makes certain marriages and emigration complicated or delayed. The overwhelming majority of respondents 45% see their future in the country, 38% want to leave Armenia. These figures indicate young people initiating a family's hardships. Nowadays, the increasing divorce in the neighbouring reality makes the young man afraid to start a family. Fear of parenting a baby alone, avoiding problems alone, etc.

It was important to determine what age the older generation preferred for marriage and what age the current young people preferred. Of the 140 young people surveyed, almost 113 said that the best age for marriage for men is 25-27 and for women 22-24. The others found it hard to respond, comparing it to the time where a loved one was found. This is the case for youth from cities. The older generation had a lower range of positions on this subject. The age of marriage for boys was 20-21 years, and for girls - 18-19 years.

The youth viewed the particular age of marriage as the age of some individuals with a certain family-related concept who also had some experience in life. And at that age, the elder argued that marriage conditions are lower, so young people aren't that choosy and decide to marry sooner.

## **Conclusion**

We cannot say with certainty whether it's the right or wrong consideration of the issues. Reasonable reports and statistics may demonstrate the real picture of it. The young generation is not aware if it is content, that whoever tolerates all these compromises all for the sake of family longevity, or that families want to separate the family in order of their own needs and well-being. This and several other questions are challenging. Without the institution of the family, there's no civilization. Family forms have evolved, the family has been replaced by new ones. In essence, it causes the social structure of society to be changed or disrupted. And, that threatens our safety and our moral character at the national level. However, any family area should be subject to extensive multi-content studies so that current patterns in the economic, social, and cultural dynamics of the family can be identified, maintained, and improved for the good of the families. Realizing that all "ill" in nature should be discarded at an initial stage rather than with the disruptive and negative effects for the future.

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## THE PSYCHOLOGICAL MANIFESTATIONS OF THE ARMENIAN YOUTH'S POLITICAL ACTIVITY

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### **Abstract**

A study was carried out to review the motives and manifestations of the political activity of the Armenian youth. The study involved 100 undergraduate and graduate students of the Armenian State Pedagogical University. The following varieties of the survey method were used: written survey - questioning; oral group survey - conversation. The data obtained were compared with the results of similar studies conducted with young people in Russia. According to the survey results, the majority of Armenian youth are interested in politics, but only a few believe that politics plays a significant role in their lives. Politically active youth are convinced that their demands can be heard in the public and political life of the country. The following motives condition the political activity of the Armenian youth: preserving the integrity of the Motherland, restoring the infringed human dignity, demanding the restoration of social justice, improving the economic situation of the country. Most young people do not have clear political preferences: their attitude is often conditioned by sympathy for the personality of the party leader, rather than knowledge of party programs. Young people's political activity is predominantly affective in nature: their attitude towards politicians is very emotional, the reasoning and analytical components are weakly expressed. Armenian youth has a subjective attitude to political events and gives opposite assessments. On the one hand, young people demand freedom of expression in their political behaviour, but on the other hand, they show intolerance towards dissent.

School and university education for teenagers and youth should contribute to developing a culture of conducting a civilized dialogue.

### **Keywords and phrases**

Youth, political activity, subjective point of view, polar assessments, civilized dialogue.

**ՀԱՅ ԵՐԻՏԱՍԱՐԴՈՒԹՅԱՆ ՔԱՂԱՔԱԿԱՆ ԱԿՏԻՎՈՒԹՅԱՆ ՀՈԳԵԲԱՆԱԿԱՆ  
ԴՐՍԵՎՈՐՈՒՄՆԵՐԸ**

**ՄԱՐԻՆԵ ՄԻՔԱՅԵԼՅԱՆ**

**Խ. Արոյանի անվան հայկական պետական մանկավարժական համալսարան  
Հոգեբանական գիտությունների թեկնածու, դեցեմտ  
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**Համառոտագիր**

Հայ երիտասարդների քաղաքական ակտիվության շարժառիթներն ու դրսևորումներն ուսումնասիրելու նպատակով անց է կացվել հետազոտություն: Կիրառվել է հարցման մեթոդը (անկետավորում և զրույց): Հետազոտությանը մասնակցել են Հայկական պետական մանկավարժական համալսարանի բակալավրի և մագիստրոսի կրթական աստիճան ստացող 100 ուսանողներ: Ստացված տվյալները համեմատվել են Ռուսաստանի երիտասարդների հետ անցկացված նմանատիպ հետազոտությունների արդյունքների հետ: Համաձայն հարցման տվյալների՝ հայ երիտասարդության մեծ մասը հետաքրքրվում է քաղաքականությամբ, սակայն քչերն են գտնում, որ իրենց կյանքում քաղաքականության դերը մեծ է: Քաղաքական ակտիվություն ցուցաբերող երիտասարդները վստահ են, որ իրենց կողմից առաջադրվող պահանջները հնարավոր է լսելի դարձնել երկրի հասարակական-քաղաքական կյանքում: Հայ երիտասարդների քաղաքական ակտիվությունը պայմանավորված է հետևյալ շարժառիթներով՝ հայրենիքի ամբողջականության պահպանում, ոտնահատված մարդկային արժանապատվության վերականգնում, սոցիալական արդարության վերականգնման պահանջ, երկրի տնտեսական վիճակի բարելավում: Երիտասարդների մեծ մասը չունի հստակ քաղաքական նախընտրություններ. նրանց դիրքորոշումը հաճախ պայմանավորված է կուսակցության լիդերի անձի հանդեպ ունեցած համակրանքով, ոչ թե կուսակցության ծրագրերի իմացությամբ: Երիտասարդների քաղաքական ակտիվությունը հիմնականում կրում է աֆեկտիվ բնույթ. քաղաքական գործիչների հանդեպ նրանց վերաբերմունքը խիստ հուզական է և զգացմունքային, դատողական և վերլուծական բաղադրիչն ունի նվազ դրսևորում: Հայ երիտասարդները քաղաքական իրադարձությունների նկատմամբ ունեն սուբյեկտիվ վերաբերմունք և տալիս են բևեռային գնահատականներ: Երիտասարդներն իրենց քաղաքական վարքագծում պահանջում են սեփական կարծիքն արտահայտելու ազատություն, սակայն դրսևորում են անհանդուրժողականություն այլակարծության նկատմամբ: Դպրոցական և բուհական ուսումնառության ընթացքում պատանիների և երիտասարդների մեջ պետք է ձևավորել քաղաքակիրթ երկխոսություն վարելու մշակույթ:



## **Բանալի բառեր և բառակապակցություններ**

Երիտասարդություն, քաղաքական ակտիվություն, սուբյեկտիվ տեսանկյուն, բևեռային գնահատականներ, քաղաքակիրթ երկխոսություն:

## **ПСИХОЛОГИЧЕСКИЕ ПРОЯВЛЕНИЯ ПОЛИТИЧЕСКОЙ АКТИВНОСТИ АРМЯНСКОЙ МОЛОДЕЖИ**

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### **Аннотация**

Проведено исследование с целью изучения мотивов и проявлений политической активности армянской молодежи. В исследовании приняли участие 100 студентов бакалавриата и магистратуры Армянского государственного педагогического университета. Были применены следующие разновидности метода опроса: письменный опрос – анкетирование; устный групповой опрос – беседа. Полученные данные сравнивались с результатами аналогичных исследований, проведенных с молодежью в России. Согласно результатам опроса, большинство армянской молодежи интересуется политикой, но лишь немногие считают, что политика играет большую роль в их жизни. Политически активная молодежь убеждена, что их требования могут быть услышаны в общественной и политической жизни страны. Политическая активность армянской молодежи обусловлена следующими мотивами: сохранение целостности Родины, восстановление ущемленного человеческого достоинства, требование восстановления социальной справедливости, улучшение экономического положения страны. У большинства молодых людей нет четких политических предпочтений: их установка часто обусловлена симпатией к личности лидера партии, а не знанием партийных программ. Политическая активность молодежи носит преимущественно аффективный характер: их отношение к политикам очень эмоциональное, рассуждающий и аналитический компоненты выражены слабо.

Армянская молодежь субъективно относится к политическим событиям, дает полярные оценки. С одной стороны, молодые люди в своем политическом поведении требуют свободы выражения мнений, но с другой стороны, проявляют нетерпимость к инакомыслию.

Школьное и университетское образование юношей и молодежи должно способствовать развитию культуры вести цивилизованный диалог.

### **Ключевые слова и фразы**

Молодежь, политическая активность, субъективная точка зрения, полярные оценки, цивилизованный диалог.

## **Introduction**

Political views are the combination of beliefs regarding the economy, the structure of the state and society. Political views include ideas about how the law and social morality should be.

The psychologists and neurobiologists of the USA and UK conducted studies to find connections between a person's political views and the neural processes of their brain. Darren Schreiber used magnetic resonance imaging to study the brain's activity while making important, risky decisions. Schreiber emphasizes that while people with conservative and liberal leanings made similar decisions, different parts of their brains showed activity [7].

Studies conducted with monozygotic twins show that there is a partial genetic predisposition towards some political views. Of course, political beliefs aren't being inherited in an obvious way like height, the colour of eyes and hair. Still, there is a basis to assume that people are born with some predisposition towards different ideologies [6].

John R. Hibbing and Read Montague studied the inborn predispositions in the brain. For that purpose they studied people's instinctive reactions towards fear and disgust provoking visual stimuli. As a result, they found a link between the strength of the reaction to the corresponding images and the degree of conservatism of the subjects' views. Hibbing points out that people who are wary of immigration, opponents of abortion, supporters of more cruel punishment for criminals are much more sensitive to images that cause disgust [8].

At the moment, it has been discovered that there is a correlation between the political worldview of people and how they perceive risk, fear or disgust [see 6]. John Hibbing assumes that subconscious motivators could drive our political views. People think that their political sets are rational, and when they are hinted that this may be a predisposition, which they are not fully aware of, people don't want to believe it. For clarity, Hibbing compares people's ideological tendencies with which hand they prefer to use. It was believed that being left or right-handed was a habit that could be changed

for a long time, but today it's known for sure that there is a deep biological predisposition behind this.

Indeed, the studies of Darren Schreiber, John R. Hibbing and Read Montague can't be a reason to assume that a person's political views are only affected by genetics. In reality, political views are mainly formed under the influence of the environment. Though, we must admit that there are people who never change their views under any circumstances.

The nature of the political behaviour of young people is largely determined by the specifics of their attitude to politics, their level of political knowledge, their awareness of political events and processes, i.e., cognitive political orientations, which are customarily included in political culture. The cognitive component of the political culture of a young person is formed both on a passive basis and on an active one. According to L. A. Lipskaya, political culture passively develops in the process of socialization and actively forms when a person is independently, consciously and purposefully interested in political life [2]. The level of political awareness of young citizens can be considered as a prerequisite for their political activism.

## **Methods**

To research the manifestation and the reasons behind the political activity of the Armenian youth, a study was conducted using the following varieties of the survey methods: written survey– questioning and oral group survey - conversation. The respondents of the study were 100 students from the Armenian State Pedagogical University. The latter study in the first and second courses for their bachelor degree and in the second course for their graduate degree. The results were compared to the results of similar researches done in Russia [1, 2, 3, 4, 5]. The author relied on the analysis of Yu. R. Vishnevsky, L. A. Lipskaya, V. V. Petukhov and A. V. Ribakov.

## **Results and discussion**

According to the author's poll conducted, 84% of young Armenian students are interested in politics, and the other 16% are not.

According to research from Russia, 37% of young people are interested in politics, and 62% don't show any interest. Despite the lack of interest in politics, the majority of the younger generation of Russia are confident that their life depends on politics: 51% consider this dependence strong, 23% consider it weak, and only 15% believe that their life does not depend on politics at all [4].

26% of the Armenian youth think that politics heavily influence their lives, 48% consider that influence weak, and 19% are confident that their life isn't influenced by politics at all. 7% didn't have an answer.

To the question "Do you watch or listen to programs about politics?" positively answered 68% of the Armenian youth, 32% responded negatively. Remarkably, 68% of the youth participate in political discussions too, and 32% don't. It's evident that those young people who follow political broadcasts using mass media also actively discuss recent political events.

According to sociological polls, 90% of the Russian youth sometimes listen to or watch political broadcasts. But according to A. V. Ribakov, interest in politics among most young people is passive mainly since, having a common understanding of political events in the country, young people do not seek active participation in political life, showing civic and political apathy. Young people are more willing to discuss politics rather than participate in it. Instead of meetings and demonstrations, a significant part of young people prefers virtual political Internet discussions, politicized talk shows, which are a kind of entertaining game with a superficial presentation by participants of their ideological positions that attract a specific part of young people with their expression of emotions.

This suggests that many young people are characterized by affective political orientations, which are built on the basis of feelings and emotions caused towards various political figures [5].

Both Armenian and Russian young people usually assess political events from a subjective perspective, giving polar assessments to the political events. They often give these designations "good-bad", "like-dislike", "white – black", "ours - not ours", "revolutionary – non revolutionary".

53% of the Armenian youth thinks that they take part in the country's political life, and only 21% believe they are completely apoliticalized. According to the poll's results, the main reasons behind the apolitization of young people are: thinking that being involved in politics is pointless, that politics are constantly changing and unstable, the unimportance of political life, or simply the existence of other interests in their life.

Yu. R. Vishnevsky thinks that the reasons and motives of apoliticality among the Russian youth are: uncertainty that personal participation may matter, distrust of politicians, poor awareness of the political processes, indifference to politics, presence of other interests, lack of free time [1].

It's evident that the Armenian apoliticalized youth mainly has negative or indifferent opinions towards politics. The Russian youth distrust politicians and are uncertain that personal participation can matter.

The question "Are you ready to take part in political protests?" positively answered 94% of the Armenian youth; moreover, 70% of them are sure that their voice can be heard in the social-political life of the country.

V. V. Petukhov thinks that some Russian youth do not want political upheavals and do not encourage violent methods of political activity. Others are sure that one of the most effective ways to influence the authorities to defend their interests is direct action: going out into the streets, participating in rallies and demonstrations [3].

Armenian youth are actively motivated by the following political motives (the list goes from most to least significant).

1. Preserving the integrity and security of the borders of the Motherland;
2. The requirement of giving a person the sense of self-worth;
3. The sharp demand for the restoration of human dignity;
4. The need to restore social justice;
5. The need to improve the economic situation of the country;
6. The need to solve environmental problems.

By showing a high level of political activity, Armenian students, however, aren't always able to clearly articulate their political position and true motives for their attitude towards a particular political direction or party.

65% of Armenian youth do not have a clear political orientation. Often, the basis of their political choice is only the personality of the party leader, personal sympathy for him, and no knowledge of the party's programmatic orientation.

In the political struggle of young people, there is also a lack of experience in political culture, which is manifested in the form of contradictory tendencies in the political culture of young people. On the one hand, young people make fair demands of civil liberties, and on the other hand, they are often not ready to listen and accept any dissent and do not tolerate the opposite opinion or approach. In this situation, the socializing role of educational institutions grows; they should form the ability to conduct a civilized dialogue among young people.

## **Conclusions**

Summarizing the results of the study, the author can come to some conclusions.

- Most Armenian youths are interested in politics, but few think politics plays a significant role in their lives. Armenian student youth cannot be considered over-politicized even when the participation of young people in the political events of Armenia is crucial.

- Politically active youth are convinced that their demands can be heard in the public and political life of the country.

- The following motives condition the political activity of the Armenian youth: preserving the integrity of the Motherland, restoring the infringed human dignity, demanding the restoration of social justice, improving the economic situation of the country.

- Most young people do not have clear political preferences: their attitude is often conditioned by sympathy for the personality of the party leader rather than knowledge of party programs.

- Young people's political activity is predominantly affective in nature: their attitude towards politicians is very emotional, the reasoning and analytical components are weakly expressed.

- Armenian youth has a subjective attitude to political events and gives opposite assessments. On the one hand, young people demand freedom of expression in their political behaviour, but on the other hand, they show intolerance towards dissent.

- School and university education for teenagers and youth should contribute to developing a culture of conducting a civilized dialogue.

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## QUALITATIVE MEASURES OF FAMILY FUNCTIONS AFFECTING CHILD DEPRIVATION

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### **Abstract**

The article discusses the phenomenon of child deprivation from parental care, with the aim of extracting the basic measurements of family functions that are significant in terms of child abandonment.

Specifically, the approaches proposed by Bowlby, Spence, Kadushin and Burnstein were discussed in the context of risk factors causing child abandonment. Besides, the concept of family resilience was studied as a new perspective on family functioning.

Even though there exists a range of diverse approaches in social sciences regarding family care deficiencies and child abandonment, there is still a need for additional studies to develop a more structured view of the phenomenon. Specifically, to extract the practical measurements of the classification of the phenomenon, both for research and practical purposes. In particular, a qualitative research was carried out based on the methodology of the grounded theory. In the frames of the research, about 282 registered cases of child abandonment were studied. The cases were classified into four main categories, according to the circumstance of becoming deprived of parental care: death of a parent, refusal of care, inability, or impossibility to take care of a child. As a result, it was possible to identify the essential factors that accompany each of these four circumstances and to highlight the key axes through which the guardianship vector passes.

The results of the article allow us to state that firstly, child abandonment is a multilayer phenomenon, that is why both the causes and impact of abandonment at least depend on social relations (child-parent, child-substitute parent, parent-substitute parent) and main components of deprivation (nature and quality of the relationship, circumstance of becoming deprived of care, nature of the action to deprive the child of care). Second, child abandonment takes place in cases when the above-mentioned risk factors intersect. Third, as a rule, abandonment is an intentional and voluntary action by the parent. And finally, the amount and quality of natural social ties are directly related to the outcome of child abandonment.



In addition to the findings, the proposed approach to the classification of the phenomenon of children's deprivation from parental care in the previous article has been revised, which can be useful both from theoretical and research perspectives and have an active impact upon the policy development for children deprived of basic care.

### **Keywords and phrases**

Childhood, childhood content, family functions, qualitative measurement of family functioning, care deprivation, child abandonment, social relations, grounded theory.

## **ԸՆՏԱՆԻՔԻ ԳՈՐԾԱՌՆՄԱՆ ՈՐԱԿԱԿԱՆ ՉԱՓՈՒՄՆԵՐԻ ԱԶԴԵՑՈՒԹՅՈՒՆԸ ԵՐԵՒԱՆԵՐԻ ԽՆԱՄԱԶՐԿՈՒԹՅԱՆ ՎՐԱ**

### **ՏԱԹԵՎԻԿ ԿԱՐԱՊԵՏՅԱՆ**

ասպիրանտ, դասախոս

ԵՊՀ սոցիալական աշխատանքի և սոցիալական տեխնոլոգիաների ամբիոն  
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### **Համառոտագիր**

Հոդվածը քննարկում է երեխաների խնամազրկության երևույթը՝ նպատակ ունենալով դուրս բերել ընտանիքի գործառնման այն հիմնական չափումները, որոնք նշանակալի են երեխաների լքման տեսանկյունից:

Այս համատեքստում հոդվածում անդրադարձ է կատարվում Սպենսի, Բոուլբրի, Կադուշինի և Բարնշտեյնի՝ ընտանիքում մանկալքության տեսանկյունից ռիսկային գործոնների դասակարգմանը, ինչպես նաև ընտանիքի դիմակայության մոտեցմանը, որն ընտանիքի գործառնման նոր մոտեցում է առաջարկում:

Չնայած սոցիալական գիտություններում ընտանեկան խնամքի թերացումների վերաբերյալ տարատեսակ մոտեցումների առկայությանը՝ երևույթի վերաբերյալ կառուցվածքային պատկեր ունենալու համար անհրաժեշտություն կա լրացուցիչ ուսումնասիրությունների: Այս համատեքստում իրականացվել է որակական հետազոտություն՝ հիմնավորված տեսության մեթոդաբանության կիրառմամբ: Մասնավորապես, կատարվել է 2007-2018 թթ. երեխաների լքման շուրջ 282 գրանցված դեպքերի ուսումնասիրություն, որոնք, ըստ խնամազուրկ դառնալու հանգամանքի, դասակարգվել են 4 հիմնական կատեգորիաներում՝ ծնողի մահ, խնամքից հրաժարում, անկարողություն, անհնարիություն: Արդյունքում հնարավոր է դարձել դուրս բերել նշված չորս հանգամանքներից յուրաքանչյուրի դեպքում ուղեկցող էական գործոններն ու ընդգծել այն հիմնական առանցքները, որոնց հատման կետով է անցնում խնամազրկության վեկտորը:

Ստացված արդյունքները թույլ են տալիս պնդել, որ նախ՝ լինելով բազմակողմանի երևույթ, խնամազրկության պատճառները և հետևանքները առնվազն կախված են սոցիալական կապերից և լքման հիմնական բաղադրիչներից: Երկրորդ՝ երեխայի լքումը տեղի է ունենում, եթե նվազագույնը երեք ռիսկի գործոն դրսևորվում է միաժամանակ: Երրորդ՝ որպես կանոն, լքումը ծնողի կողմից նպատակադրված գործողություն է: Եվ վերջինը՝ սոցիալական կապիտալի ծավալը և որակը ուղիղ կապի մեջ են խնամազրկության ելքի հետ:

Բացի այդ, վերանայվել և ճշգրտվել է նախորդ հոդվածում խնամազրկության երևույթի դասակարգման վերաբերյալ առաջարկված մոտեցումը, որը կարող է օգտակար լինել երևույթի ուսումնասիրման ինչպես տեսական ու հետազոտական հարցերի տեսանկյունից, այնպես էլ գործնական նշանակություն ունենալ խնամազուրկ երեխաների վերաբերյալ քաղաքականության մշակման տեսանկյունից:

### **Բանալի բառեր և բառակապակցություններ**

Մանկություն, մանկության բովանդակություն, ընտանիքի գործառնում, ընտանիքի գործառնման որակական չափումներ, խնամազրկություն, երեխայի լքում, սոցիալական փոխհարաբերություններ, հիմնավորված տեսություն:

## **ВЛИЯНИЕ КАЧЕСТВЕННЫХ ИЗМЕРЕНИЙ ФУНКЦИОНИРОВАНИЯ СЕМЬИ НА ДЕПРИВАЦИЮ ДЕТЕЙ**

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### **Аннотация**

В статье обсуждается феномен детей, лишённых опекуна с целью выявления базовых показателей функционирования семьи, значимых с точки зрения депривации детей.

В частности, обсуждались подходы, предложенные Боулби, Спенсом, Кадушиным и Бернстайном, в контексте факторов риска, вызывающих отказ от детей. Кроме того, изучалась концепция устойчивости семьи как новый взгляд на функционирование семьи. Несмотря на то, что в социальных науках существует целый ряд разнообразных подходов к проблемам дефицитов семейного ухода и отказу от детей, для разработки более структурированного взгляда на это явление

все еще существует потребность в дополнительных исследованиях. В частности, для извлечения практических мер классификации явления, как для исследовательских, так и для практических целей.

Для решения этой проблемы было проведено качественное исследование с помощью методологии обоснованной теории, в частности, было изучено 282 зарегистрированных случая лишения опеки, которые были разделены на 4 основные категории в зависимости от обстоятельств осиротения: смерть родителей, отказ в уходе, неспособность и невозможность опекунства. В результате были выявлены существенные факторы, сопровождающие каждое из этих четырех обстоятельств и выделены ключевые оси, через которые пересекается вектор лишения опекунства.

Результаты статьи позволяют констатировать, что, во-первых, отказ от ребенка является многослойным явлением, поэтому как причины, так и последствия отказа от ребенка зависят как минимум от социальных отношений и основных компонентов депривации. Во-вторых, отказ от ребенка происходит в условиях пересечения вышеперечисленных факторов риска. В-третьих, отказ от ребенка, как правило, является преднамеренным и добровольным действием родителя. И, наконец, количество и качество естественных социальных связей напрямую связаны с исходом отказа от детей.

Кроме того, был пересмотрен и уточнен подход к классификации феномена лишения опекунства, описанный в предыдущей статье, что может быть полезно как с точки зрения теоретических и исследовательских вопросов, так и для разработки политики в отношении детей, лишенных опеки.

### **Ключевые слова и фразы**

Детство, содержание детства, функции семьи, качественное измерение функционирования семьи, лишение опекунства, отказ от ребенка, социальные отношения, обоснованная теория.

## **Introduction**

Various sources of sociological and other social sciences clearly state that child-parent relationships, family care deficiencies, as a rule, are ultimately seen from the perspective of the child's future. Significantly, judgments about the direct effects of family care deficiencies are more often narrowly examined in the context of age and developmental psychology, specifically in the frames of the concepts of maternal deprivation, childhood fears, and trauma. (Freud, 1920; Bowlby, 1982; Adler 1985, Theodore J. Gaensbauer & Leslie Jordan, 2009; etc.). In sociology, they are discussed in

one case in terms of the development and manifestation of deviant behaviour, on the other hand in terms of the social position of the child and the social roles he/she possesses. The issue of child abandonment, the lack of care, is more discussed in the historical-sociological context, specifically how interconnected the development of childhood perceptions and child abandonment / neglect are (Aries, 1962; Kon, 2003; Qvortrup, 2005; Johnson & James, 2016). The philosophical side of the discussed issue refers to the discussion of the social philosophy as a starting point, considering the moral side of the child-parent relationship, examining it from the perspective of child's and parent's rights and responsibilities (Schoeman, 1980, Sorokin, 1994; Hegel, 1990).

Despite the diversity of studies on family care deficiencies and their implications, they are insufficient to formulate the research and practical positions needed to address child abandonment and its potential consequences. Discussions on the phenomenon of deprivation of children's care in the above disciplines require additional research, documentary data, which will allow to make the ideas about the phenomenon more structured, to specify them, separating the practical measurements of the classification of the phenomenon, both for research and practical purpose.

This article is an attempt at such an approach.

### **Theoretical and methodological basis**

Family life, according to Spence, is one of the oldest known applied arts in the world (Spence, 1946, p. 11). Mixed with parental wisdom, it is the axis around which the content of the child's early childhood is shaped and observed, hence accordingly accumulated, to the main paradigm of later (future) life. It is necessary to discuss the issues of children care organization, their opportunities for healthy and prosperous development in the context of one of the oldest social institutions - the family, as an acceptable environment which can offer appropriate conditions for the child to become a self-sufficient individual giving meaningful content to their childhood.

Given the relatively small influence of parental care on child development compared to non-familial environmental impacts (Mekertichian, Bowes 1996; Rowe 1994), stated in the social genetics, this article considers "meaningless childhood" as an absence of the above conditions. We support the idea that although with age, the influence of the family on the child's lifestyle decreases, still the family remains the main guarantor for the child's adequate physical growth and health and provides a place for a necessary emotional experience and the opportunity to master acceptable patterns of behaviour (Spence, 1946, p. 11), at the same time, "permanent happiness in the family is a myth" (Spence, 1946, p. 38). A meaningful childhood does not assume to keep the child away from all possible dangers and negative experiences. The epitome of

childhood directly depends on the ability of the parents to survive, discuss, and interpret opportunities, difficulties, problems, ups and downs in an acceptable and protected environment for the child, in line with age and development, which instils the “wisdom” of life (Spence, 1946, p. 38, 46). From the ideological point of view, the mentioned approach is fully integrated within the framework of modern concepts of childhood, where the child is not the passive bearer of situations and the object of socialization but the active participant of his life.

What Spence describes as wisdom, Bowlby interprets as the creation of an environment that encourages, supports, and collaborates with the child's parents, allowing them to become competent in social interactions from an early age (Bowlby, 1982, pp. 377-378).

Bowlby identifies three main groups of reasons for the failure of care on behalf of a child's biological or kinship family: (1) the family was formed on illegitimate grounds, i.e. without official registration; (2) although the basis for forming a family is legal, it fails to function effectively due to economic circumstances, chronic physical disability, or mental instability of parents, (3) the family is broken up and unable to function due to the death, imprisonment, emigration, abandonment, hospitalization, divorce of the parent(s), as well as various natural, man-made disasters (Bowlby, 1952, p. 73). The proposed approach is quite broad in its scope, and the limits of the proposed classification are not clear, as the manifestations of care deficiencies, such as neglect, physical violence, lack of parental control, unsuccessful marriage, abandonment, divorce, absence of substitute caregivers (Bowlby, 1952, pp. 76-81) applies equally to all three groups.

Kadushin looks at care deficiencies from the perspective of a parent-child network and singles out seven main factors: parental physical absence, inability, and rejection of parental roles on behalf of parents, conflicts between expectations of mutual roles by parents, role conflict between different parental roles, physical or mental/emotional disability of the child, lack or insufficiency of community resources (Kadushin, 1974, pp. 12-13).

Michael Burnstein proposed another classification. When discussing the historical (western experience), sociological and psychological aspects of child abandonment, he uses the concept of "physical abandonment" to separate care from neglect. In this context, the author interprets child abandonment as an act of renouncing the child by the parent, where parent acts as an "owner" and the child as "his/her property". In his research, the author mentions the following risky or "noteworthy" factors as essential in terms of deprivation of child care: a) mother considers her own child as a burden, b) the mother has problems with adjustment, responsibility, which are the result of her own life story, c) the mother of the child can not expect support from the father of the

child, d) the child was born through an extramarital affair, e) unwanted pregnancy in a marriage characterized by volatile relationships, f) aggressive, rebellious, behavioural difficulties, child abuse experience. The author notes that these are just risk factors and do not necessarily lead to deprivation of care; however, they do lead to some type of family disadvantage (Burnstein 1981, pp. 218-219). This approach mainly is interesting, because of introducing the individual trait of a child as a possible factor of abandonment.

These and other similar approaches, as well as the entrenchment of system theory and ecological model in the field of family and childhood studies, changed the definition of a 'normal or "healthy" family, transforming the notion that families without problems are healthy and putting forward the view that families are healthy who are able to respond and to overcome crises that arise during the family life. Accordingly, the concept of family resilience or, in other words, family life crises was put forward to overcome them. The latter emphasizes especially the existence of two interrelated family processes in the resistant family: regulation and adaptation, which as protective factors allow the family to maintain its integrity and functionality (Maurovich et al., p. 3).

The concept of family resilience in our research is so important that crises in family life that lead to child abandonment (if viewed consequently) should be considered not only in terms of 'harm' but also in terms of protective factors that include family resilience and unity, the existence of shared beliefs, joint actions and governance, flexibility, access to formal and informal social support, etc. Accordingly, deprivation of childcare becomes a hindrance to the disruption of the balance of these two types of factors in the family in favour of the detrimental factors.

It is evident from the presented approaches how diverse the qualitative measurements of childhood and family life are. Simultaneously, some overlaps or intersections can be observed in them, which suggests that despite this diversity, there are still some more significant factors of influence (whether it is a protective or a detrimental factor). According to this, we believe that the initial guidelines detailing the circumstances that lead to a child's abandonment at least include the following basic measurements: the intention to have a child and the social and the family context of the birth of a child, the ability to provide physical care for the child, the quality and strength of the parent's attachment to the child. These measurements have been put forward in this study to discuss in depth their approach to classifying the phenomenon of a child deprived of care: circumstances of becoming deprived of care, the nature of resulting in deprivation of care, the existence of a relationship with the previous caregiver and the quality, as well as the existence of a relationship with the person replacing the parent (Karapetyan, 2019, p. 86).

## Methods

In the framework of the research of the studied topic, the methodology of grounded theory was applied, particularly, the methodology of the constructivist grounded theory proposed by Charmaz.

As part of our study, the application of this methodology is so reasonable that it first coincides with our goal of building a new theoretical approach, on the other hand, it promotes an inductive approach to interpreting phenomena, which is essential to us in that it provides an opportunity to study and investigate phenomena, taking into account each individual case of childcare deprivation. As for the expediency of applying the constructivist direction in particular, is the fact that the procedures necessary for the researcher's freedom of interpretation of the phenomena, as well as for having valid data, are best combined here. Considering the availability of systematic factual data on cases of childcare deprivation in the database of the Child Support Center of the Fund for Armenian Relief (hereinafter referred to as the Center), the data of children sheltered in the Center in 2008-2017 were selected as the object of research. From the point of view of the research, the use of this database is so reliable that during the mentioned period the Center acted as the primary, main link of shelter for children at risk of guardianship; as a result it contains data on children at risk of guardianship from the whole country. On the other hand, the cases are well documented, which allows for in-depth analysis of qualitative data.

Taking into account that they are sheltered in the Center due to other circumstances in the child's life, in the first stage, a targeted sample of cases was made, removing from the existing 1389 registered cases under the influence of another factor, 282 cases were separated, in which deprivation of care was the main reason for the child to appear in the Center. After the clarification of the mentioned sample consolidation, the study of individual cases (by the case, we mean the family as a unit) was started, observing the requirements of the grounded theory procedure to construct a theoretical sample based on the identified initial codes (related to the aspects of the child abandonment event), then sub-categories and categories were formed, which are presented in the research results.

Given the multi-component nature of the phenomenon of childcare deprivation, the fact that the sub-categories of these categories may appear in a single case, the essential factor in the case classification was considered fundamental.

## Main Results

Within the framework of this analysis, the starting point was considered to be the circumstances of the child becoming deprived of care, in particular considering the cases when the child is deprived of family care, is sheltered in Children's Support Center due to the death of the parent, the parent's voluntary refusal to take care of the child, the inability or impossibility of the parent to take care of the child.

**Factor 1.1 Death of a parent/primary caregiver:** This factor has at least two areas of discussion: first, it is about the death of one parent or parents or the only parent. It makes sense to consider the circumstances of the first case under the following factors of the first component. As for the second case, when the child is factually left without care, the fourth group of factors, that is, the nature of the relationship with the substitute person, acquires special importance, and the other factors are considered from the point of view of this person.

In fact, the death of the parent/s leads to the child being deprived of care and being removed from their natural environment, in cases when the impossibility of the substitute person follows it to assume the child's care, the obligatory nature of making a decision about caregiving, as well as the lack of importance given to the relationship with the parent's/primary caregivers of a child.

When talking about substitute caregivers, it is essential to consider another option when two groups of caregivers are formed: a formal substitute caregiver and an actual substitute caregiver. In this case, the nature of the relationship with the caregiver begins to change over time; although it was initially described as positive-constructive, however, a new "de facto" caregiver has appeared, whose presence has made the mentioned connection "destructive". Moreover, it is interesting to discuss this case in the contexts of the caregiver's inability and forced decision-making factors, which can be repaid even as a result of previous experience of positive relationships and professional intervention.

**Factor 1.2. Refusal of care:** Interestingly, in the case of denial of care, one can meet all the three characteristics that describe the nature of implementation: purposeful-voluntary, forced, chronic-repetitive. Analysis of the issues shows that these three are closely related to whether a parent/caregiver views a child in his or her future plans.

Usually, there are no constructive relationships by nature; moreover, there are cases when the caregiver purposefully leads the existing relationship to an end, in this case resulting in the final severance of the connection, even if from the beginning those relations were positive. It is especially evident when a parent of a child enters a new marriage.



In this context, the phenomenon of “perception of events” by children is interesting. Moreover, in this case, it seems that the circumstances of the child's age and seniority gain significant weight, especially when it comes to setting one's conditions before one's parents, which is more likely to be the case with siblings. In fact, in most cases, the children try to keep the relationship with the caregiver until the end. In a sense, this is an instinctive move to ensure one's own safety, which is described in detail in Bowlby's “Attachment and Loss” book (Bowlby, 1982).

It is also seen as a “normal” or an acceptable act by a parent to abandon or refuse to care for a child, in one instance. In the other instances, one of the most common typical cases is the parent's observation of the first marriage and the birth of the child from that marriage as a mistake of youth or a result of coincidence. It is especially true when it comes to early or forced marriage. Moreover, in such cases, the abandoning parent, on the one hand, tries to relinquish his responsibility for the abandonment of the child, on the other hand, there are cases when the child is accused of abandonment. Another important factor here is the attitude of the caring parent towards the child. When a child is directly associated with a father or mother, thus being targeted as a “child of the spouse” who “can not be good” and from whom it is necessary “get rid of”. As a rule, in most cases, the child born from the first marriage is at risk of abandonment, when the caregiver is the mother who is trying to remarry, in the case of male caregivers the abandonment is less frequent (if the man tries to form a second family, then the children of the first marriage are quietly transferred to the second family, regardless of the nature of the relationship, while in the case of women the children are mostly abandoned or left in the care of relatives).

**Factor 1.3 Inability.** This factor is interesting; in one case, it is a reason given by the parent to avoid actual care, which is at least considered more acceptable at the level of public perception. The other extreme is that the relevant officials/bodies can define the inability to provide care, and the caregiver is generally against it. This is especially true in the presence of mental health problems. Moreover, in the case of inability to discuss in its classical sense, we are usually talking about “unsuitable care” as in the form of forced “removal” - deprivation from caring, where the possibility of positive-constructive relations is relatively high. Of course, there are also destructive and damaging relations.

When talking about inability, one aspect can be singled out, which is related to the division of roles of parents in the family in terms of care of the child; this case is quite similar to Kadushin's approach to parental role conflict (Kadushin, 1974, pp. 20-21). However, we consider the issue in a slightly different dimension. In particular, based on cases where the child's father or mother leaves or simply goes to another place of work, and the other parent, although probably has the ability, however, at the

level of self-perception, she (or he) may not consider herself (himself) to combine these two main components of family problems with the provision of economic support and care. In fact, in this case, the cases succeed when there is a replacement or additional “other” - a relative, friend or colleague, who is able to share the burden of responsibilities or lighten it. In other cases, such situations usually lead to abandonment.

The other problem here is not the provision of care, but the inability to overcome the difficulties in one's own life, which is the cause of strained family relations. In extreme cases, it can also lead to child exploitation, shifting the issue to formal decision-making. In such cases, the level of development of children's self-care and social communication skills is more obvious, or in other words, the existence of survival mechanisms. This phenomenon is also known in the literature as the concept of “super competence” and “parentification” of the child (Englehardt, 2012, Earley & Cushway, 2002, pp. 163-178, Hooper, 2008, pp: 34-43.). Moreover, the interesting thing here is that in terms of abandonment or rejection, in contrast to other factors, the age of the child becomes essential, considering whether the child will be “beneficial” in the given type of exploitation or not. It is noteworthy that often in the early or later stages when the child becomes useless, he is abandoned.

**Factor 1.4 Impossibility.** Here we need to distinguish between the concepts of impossibility and inability. Linking inability to the presence or absence of social, physical, psychological, and emotional capacity to provide care by the caregiver, and, by impossibility, understanding the existence of circumstances preventing the presence of an adult caregiver in the child's life in the given period. In this case, we can meet three types of implementation: targeted-voluntary, forced, chronic-repetitive manifestations; however, more often, we encounter recurring stages in a chronic chain of deadlocks, which begin with the extravagance of “unrealistic” promises to the child and end with another disappointment. As with inability, impossibility is used here as a means of self-justification for the parent. In these cases, the most common is the imprisonment of a single parent (cases where one parent is imprisoned and the other refuses or avoids care should be considered in the context of inability), the second option is when the parent is abroad and is unable to return due to documentation or other issues, the third is the issue of inpatient care, and the fourth is the need to pause in family life, in order to regain the care of a child. These are cases, when the family needs some time to resolve its problems, such as employment or shelter.

As the study has shown, even in the presence of commonalities and circumstances, deprivation of care as a phenomenon is extremely multidimensional and multilevel. Therefore, a combination of one or even two factors is not enough for a child to become deprived of care. Abandonment as a phenomenon occurs when risk factors

arise in the family as an organizing unit of the children's care, in several spheres of life, in parallel, at the same time, forming a negative "synergy".

In the consolidation of the discussed cases, evidently, the most frequent cases of voluntary refusal of the care of the children are when a refusal is a deliberate act. Even if at the initial stage the child-parent relationship was characterized by a positive-constructive relationship, then gradually, often intentionally by the parent, their vector was directed towards the rejection of the child and breaking the relationship. These are mainly the cases when the most significant factors are the intention to have a child, the circumstances accompanying the birth of a child, and the attitude towards the other parent. In some cases, one can find situations of inability, but, as a rule, the mentioned circumstance is a "justification" here, not a real factor.

Incidents of deprivation of care due to the incapacity of a parent have a regular or median frequency/pattern, where deprivation of care is usually a mandatory step for the parent, moreover, the existence of mutually constructive relations is not ruled out here (the perspective of the child and the parent is so often, not that of professionals). Still, in fact, chronic-variable relations that harm the child are often found here.

In the study, the cases of deprivation of care due to the death of a parent or only parent are the least common.

In general, it should be noted that from the point of view of the study of the phenomenon of deprivation of care, it is about the social relations of the parents and the child, including qualitative characteristics, in terms of volume, and the quantitative characteristics. The study of cases shows that deprivation of care, as a phenomenon, depends significantly on the existence of "family social capital" in the family (Coleman describes it as a set of interactions between parent and child) (Coleman, 1988) on the one hand, and its qualitative characteristics, and on the other hand, the connections of the family as a social unit and the family members outside the family with the environment and their qualitative characteristics (the concept of Putnam community social capital may apply here, given the broad understanding of the concept of the community) (Putnam, 2000). Therefore, when talking about deprivation of care and the circumstances leading to it, it is advisable to separate the two main areas of study:

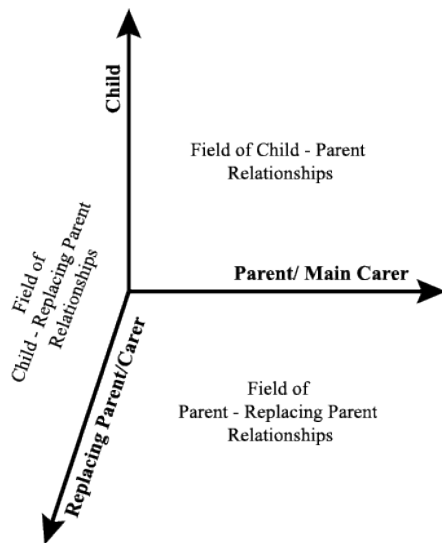
1. social relations,
2. main aspects of deprivation of care.

Let us look at social relations from the point of view of the risk of a child becoming deprived of care. Suppose we try to describe the trajectory of deprivation of care. In that case, we will see that abandonment is a result of circumstances incompatible with the child's care in the life of the child's primary caregiver. They can be both objective, such as death, illness, imprisonment, etc., as well as subjective, which are more about the caregiver, his/her abilities, opportunities in the current reality, the

child's birth circumstances, perceptions and ideas about the child's and his/her role in future plans. And these also become the direct characteristics of deprivation of care, from the point of view of abandonment, the nature of action, etc. The analysis of the cases showed that the set of objective-subjective factors ultimately leads to deprivation of care when accompanied by the presence of “cracks” in the parent-child relationship (regardless of at which stage of deprivation the gaps arise).

One of the possible actors in the field of relationships is the “substitute parent”. In our proposed classification, we considered it only in terms of the relationship with the child. However, here it becomes clear that at the same time, the nature of the relationship between the child's parent (biological/kinship) and the substitute parent is significant. Accordingly, it turns out that the field of social relations, represented by the entities involved in the process, has at least three axes: the child, the parent, and the substitute parent (See Diagram 1.). Of course, formal networks are also important here and how professionally they respond to the situation, but these are additional factors and not fundamental.

**Diagram 1. Fields of social relations in the context of deprivation of care**



Concerning the approach proposed in the above article, there is a need to review one aspect. This refers to the characteristics of the parent-child and substitutes parent-child relationship. Based on the results obtained, it should be noted that the nature of the relationship in the context of the care of a child can be described by the same measurements. At the same time, there is a need to separate this block of relationships, as we mentioned the nature of the parent-substitute parent relationship (it should be noted here that the substitute parent is a person who is part of the child's or his/her

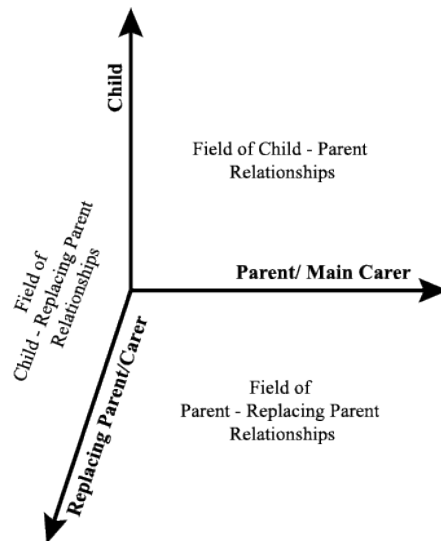
family environment and who takes care of the child before he/she enters the care system, the foster parent is not considered here yet).

Accordingly, from the point of view of interpretation measures of the caregiver-child relationship, the following scale is most applicable: positive-constructive, chronically-variable, destructive, lack of connection.

As for the interpretation of the parent- substitute parent relationship, the following scale is more applicable here: firm and stable, unstable - evasive, negative, lack of connection.

Discussing the main aspects of deprivation of care, we see that the three axes identified within the framework of our proposed approach are: the circumstance of becoming deprived of care, the nature of the relationship, the nature of the deprivation of care process, are really fundamental and it is through the intersection of these three axes that the phenomenon of deprivation of care is manifested (See: Diagram 2.).

**Diagram 2. Main aspects of deprivation of care**



We have already talked about the relationship; let us talk about the other two axes. Separate measurements characterizing the fact of becoming deprived of care were, in fact, quite effective from the point of view of the application, as they allowed to standardize the cases without losses, considering the peculiarities of each.

As for the nature of the process of deprivation of care, the three measurements proposed here: targeted-voluntary, forced, chronic-repetitive, need to be supplemented with an additional one, which we will call inactivity-indifference.

The above implies the implementation of some revisions and adjustments of the measurements in the classification of deprivation of children' care presented in the previous article, which can be summarized in Table 1.

**Table 1. Measurements of classification of deprivation of care**

Components of the process of deprivation of care	<b>(1) Circumstances that place children “at risk” of deprivation of care</b>	<b>(2) The nature of the implementation and the process of deprivation of children's care</b>
	<ul style="list-style-type: none"> <li>• Death of a parent</li> <li>• Refusal of care</li> <li>• Inability</li> <li>• Impossibility</li> </ul>	<ul style="list-style-type: none"> <li>• Intentional-voluntary action</li> <li>• Forced action</li> <li>• Chronic-recurrent</li> <li>• Inaction-indifference</li> </ul>
Nature of relationships	<b>(3) The nature of the relationship with the caregiver (parent and substitute parent)</b>	<b>(4) The nature of the relationship between the parent and the substitute parent</b>
	<ul style="list-style-type: none"> <li>• Positive-constructive</li> <li>• Chronic-variable</li> <li>• Destructive</li> <li>• Absence of communication</li> </ul>	<ul style="list-style-type: none"> <li>• Strong and stable,</li> <li>• Unstable - evasive,</li> <li>• Denial,</li> <li>• Absence of communication</li> </ul>

The study of specific cases from the perspective of the mentioned measurements from the point of view of determining the content of a child's childhood experience and predetermining the risk of abandoning a child. The use of qualitative measurement scales can be of significant practical importance for forecasting abandonments, preventing further impacts, and organizing an early intervention. Because almost ten per cent of vulnerable children in the country are yearly endangered by the deprivation of childhood and, in some cases, are abandoned at this stage, in the context of the radical changes taking place in the sphere of response to the occurrence of deprivation of care and child protection in the country, in-depth discussions on the content of this phenomenon, evidence-based generalizations and patterns can become important guidelines for the specialization of systemic change and approaches, whilst maintaining the specifics of the local context, and therefore being culturally sensitive to practical solutions to these vital issues. The issue is genuinely relevant given the differing interpretations and conflicting opinions in society regarding the systems in place to protect abandoned children.

As a continuation of this topic, it is interesting to consider the phenomenon of deprivation of care, deprivation of childhood and abandonment, as its extreme manifestation, within the context of child resilience, which is a subject of another study.

## Conclusions

Thus, as a result of theoretical-research analysis, we can single out the following main conclusions:

- **Prerequisites for the possible outcome of deprivation of care.** The phenomenon of deprivation of childcare is characterized by two main aspects *a. Social relations* (child-parent, child-substitute parent, parent-substitute parent) and *b. Main aspects/ components of deprivation of care* (nature and quality of the relationship, circumstance of becoming deprived of care, nature of the action to deprive the child of care). The probable outcome of deprivation of care, is dependant upon the steps and interventions taken between the intent for the reunification of the child with the family to the point of abandonment by the parent, is all dependant on the intersection of these two aspects. Except in cases of deliberate refusal due to the death of parents and the impossibility of objective circumstances, all other manifestations are subject to intervention and recovery of the family and care arrangements.

- **The density of risk factors.** Deprivation of care or child abandonment is a multifaceted and multilevel phenomenon, which from the perspective of the child puts them “at risk” of a minimum of the above mentioned three risk factors in terms of childcare (except for the death of one or both parents and the lack or absence of social ties).

- **Making a decision to abandon the child.** As a rule, abandonment is a deliberate action by the parent, which is an outcome of a voluntary decision. The cases when it is a forced decision and an appeal is required is less frequent.

- **The circumstance of social ties or capital.** In the context of care deprivation, the nature of the relations between the child and substitute parent, the parent and substitute parent, or the relations of a child with the adults with a positive influence is equally important. The amount of social capital and the quality of natural social ties are directly related to the outcome of care deprivation: the more positive the relationships with the substitute persons, the less likely it is that the child will be abandoned.

The results of this article can make a significant contribution to the areas of response to children’s deprivation from care, child abandonment prevention policy, and practical implementation.

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թ.:

## THE ROLE OF PUBLIC INVESTMENT POLICY IN THE FORMATION AND REGULATION OF THE INVESTMENT MARKET

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### **Abstract**

The development of a market economy in any country is impossible without systematic and effective market relations regulation. The public investment policy is the activity of state bodies and institutions aimed at influencing the investment market and redistributing the capital flows in favour of settling issues of public importance, as well as attracting investments to priority areas of economic development, defined in the relevant state programs for a certain forecast period with the account of the balance between private and public interests. The effectiveness of investment market regulation can significantly impact the overall effectiveness of the general economic policy. On the one hand, a developed investment market is necessary for the economic growth of the state. On the other hand, the active turnover of financial goods and services contributes to the development of business relations in the country.

Within the framework of state regulation of the investment market, the key role of public investment policy is to ensure the balance of private and public interests in the market, considering that personal interest is manifested in directing the investment activity to maximum profits. In contrast, the public interest lies in the state's strive to achieve socially effective results, using investments in transport, social, energy and other infrastructures.

The state carries out the function of creating a favourable investment environment in the country with the application of the active method, which is connected with the increase of the efficiency of the investment activity, as well as with the help of the tools of the method, which can be summarized as follows: ensuring favourable conditions for private investors, direct state participation in most efficient and significant investment projects for the country, application of internationally accepted criteria for assessing the financial efficiency of investments, such as current value, internal rate of return, repayment period, promotion of private sector investment through tax incentives.

## Key words and phrases

State investment policy, investment market, efficiency, public interest, economic growth.

## ՊԵՏԱԿԱՆ ՆԵՐԴՐՈՒՄԱՅԻՆ ՔԱՂԱՔԱԿԱՆՈՒԹՅԱՆ ԴԵՐԸ ՆԵՐԴՐՈՒՄԱՅԻՆ ՇՈՒԿԱՅԻ ՁԱՆՎՈՐՄԱՆ և ԿԱՐԳԱՎՈՐՄԱՆ ԳՈՐԾՈՒՄ

### ԼԵՎՈՆ ՀՈՎՆԱՆՅԱՆ

ՀՀ ԳԱԱ Մ. Քոթանյանի անվան

տնտեսագիտության ինստիտուտի ասպիրանտ

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### Համառոտագիր

Յուրաքանչյուր երկրում շուկայական տնտեսության զարգացումն անհնար է առանց շուկայական հարաբերությունների համակարգված և արդյունավետ պետական կարգավորման: Պետական ներդրումային քաղաքականությունը պետական մարմինների և հաստատությունների գործունեությունն է՝ ուղղված ներդրումային շուկայի վրա ազդելուն և կապիտալի հոսքերի վերաբաշխմանը՝ ի նպաստ հանրային նշանակության խնդիրների կարգավորման, ինչպես նաև տնտեսական զարգացման գերակա ոլորտներ ներդրումներ ներգրավելու համար, որոնք սահմանված են համապատասխան պետական ծրագրերում որոշակի կանխատեսված ժամանակահատվածում՝ հաշվի առնելով մասնավոր և հանրային շահերի հավասարակշռությունը: Ներդրումային շուկայի կարգավորման արդյունավետությունը կարող է էական ազդեցություն ունենալ հանրային տնտեսական քաղաքականության ընդհանուր արդյունավետության վրա: Դա պայմանավորված է նրանով, որ մի կողմից՝ պետության տնտեսական աճի համար անհրաժեշտ է զարգացած ներդրումային շուկա, իսկ մյուս կողմից՝ ֆինանսական ապրանքների և ծառայությունների ակտիվ շրջանառությունը նպաստում է գործարար կապերի զարգացմանը:

Ներդրումային շուկայի պետական կարգավորման շրջանակներում պետական ներդրումային քաղաքականության հիմնական դերը շուկայում մասնավոր և հանրային շահերի հավասարակշռության ապահովումն է՝ հաշվի առնելով, որ մասնավոր շահը դրսևորվում է ներդրումային գործունեությունն առավելագույն շահույթն ուղղորդելիս, մինչդեռ հասարակության շահը պետության հասարակության մեջ արդյունավետ արդյունքների հասնելու ձգտման մեջ է՝ օգտագործելով ներդրումներ տրանսպորտում, սոցիալական, էներգետիկ և այլ ենթակառուցվածքներում:

Պետությունը իրականացնում է երկրում բարենպաստ ներդրումային միջավայր ստեղծելու գործառույթ՝ ակտիվ մեթոդի կիրառմամբ, որը կապված է ներդրումային գործունեության արդյունավետության բարձրացման հետ, ինչպես նաև մեթոդի գործիքների օգնությամբ, որը կարող է ամփոփվել հետևյալով. մասնավոր ներդրողների համար բարենպաստ պայմանների ապահովում, պետության անմիջական մասնակցություն երկրի արդյունավետ և նշանակալի ներդրումային նախագծերին, ներդրումների ֆինանսական արդյունավետության գնահատման համար միջազգային ընդունված չափանիշների կիրառում, ինչպիսիք են ընթացիկ արժեքը, ներքին եկամտաբերությունը, մարման ժամկետը, հարկային խթանների միջոցով մասնավոր հատվածի ներդրումների խթանումը:

### **Բանալի բառեր և բառակապակցություններ**

Պետական ներդրումային քաղաքականություն, ներդրումային շուկա, արդյունավետություն, հանրային շահ, տնտեսական աճ:

## **РОЛЬ ГОСУДАРСТВЕННОЙ ИНВЕСТИЦИОННОЙ ПОЛИТИКИ В ФОРМИРОВАНИИ И РЕГУЛИРОВАНИИ ИНВЕСТИЦИОННОГО РЫНКА**

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### **Аннотация**

Развитие рыночной экономики в любой стране невозможно без системного и эффективного государственного регулирования рыночных отношений. Государственная инвестиционная политика - деятельность государственных органов и институтов, направленная на влияние на инвестиционный рынок и перераспределение потоков капитала в пользу решения вопросов общественной значимости, а также привлечение инвестиций в приоритетные направления экономического развития, определенные в соответствующих государственных программах для определеннй прогнозный период времени с учетом баланса между частными и общественными интересами. Эффективность регулирования инвестиционного рынка может иметь значительное влияние на общую эффективность государственной экономической политики. Это связано с тем, что, с одной стороны, развитый инвестиционный рынок необходим для экономического

роста государства, а с другой - активный оборот финансовых товаров и услуг способствует развитию деловых отношений в страна.

В рамках государственного регулирования инвестиционного рынка ключевая роль государственной инвестиционной политики заключается в обеспечении баланса частных и государственных интересов на рынке с учетом того, что частный интерес проявляется в направлении инвестиционной деятельности к максимальной прибыли, в то время как общественный интерес заключается в стремлении государства достичь социально эффективных результатов, используя инвестиции в транспортную, социальную, энергетическую и другие инфраструктуры.

Государство выполняет функцию создания благоприятной инвестиционной среды в стране с применением активного метода, что связано с повышением эффективности инвестиционной деятельности, а также с помощью инструментов метода, который можно резюмировать следующим образом: обеспечение благоприятных условий для частных инвесторов, прямое участие государства в наиболее эффективных и значимых для страны инвестиционных проектах, применение международно признанных критериев оценки финансовой эффективности инвестиций, таких, как текущая стоимость, внутренняя норма доходности, срок погашения, стимулирование инвестиций частного сектора через налоговые льготы.

### **Ключевые слова и фразы**

Государственная инвестиционная политика, инвестиционный рынок, эффективность, общественный интерес, экономический рост.

### **Introduction**

The development of a market economy in any country is impossible without systematic and effective market relations regulation. For the effective operation of the market mechanism, the state, with its regulatory functions, ensures the freedom of economic activity of independent entities of the market economy, defines the rights and responsibilities of the participants, implements the principle of economic freedom, ensures the protection of economic entities and guarantees the fulfilment of obligations of market entities<sup>(19)</sup>.

In a market economy, the effectiveness of investment market regulation can significantly impact the overall effectiveness of the public economic policy. This is because, on the one hand, a developed investment market is necessary for the state's

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<sup>(19)</sup> Gubin E.P. Legal support of freedom of economic activity. *Entrepreneurial law*. No. 4. 2015. 3–9.

economic growth. On the other hand, the active turnover of financial goods and services contributes to forming business relations in the country.

Public investment policy is one of the important components of public financial policy. Investment policy generally means a complex of measures aimed at determining the structure and scale of investments, their possible sources and directions, defining the ways and means of their distribution in different sectors and branches of the economy.

Within the framework of state regulation of the investment market, the key role of public investment policy is to ensure the balance of private and public interests in the market, taking into account that the private interest is manifested in directing the investment activity to maximum profits, while the public interest lies in the state's strive to achieve socially effective results, using investments in transport, social, energy and other infrastructures. This, in turn, stimulates the growth of key sectors of the national economy, such as industry and agriculture, the development of innovative technologies, such as improving the population's quality of life, providing housing, improving the quality of medical care, education, etc. Thus, the state investment policy ensures a balanced approach within the framework of the regulation of investment relations, taking into account both macroeconomic and microeconomic approaches to the regulation of the sector.

When implementing a macro-level investment policy, the state, acting as a governing entity, intends to take appropriate measures to attract the necessary financial resources for investment activities, promote investment activity, and increase investments' efficiency. Moreover, the investment policy incorporates both the management of state investments and a favourable investment environment for private-institutional investors.

Simultaneously, it should be noted that in addition to the macro level, the investment policy is also implemented at the micro-level by individual organizations.

### **Theoretical and methodological bases**

The main goal of the investment policy is to create a favourable investment environment, which will ensure the attraction of investment resources, increase the efficiency of their use in the context of economic and social development.

The objectives of the state investment policy are as follows:

- Ensuring sustainable economic growth,
- Improving the welfare of the population and improving the quality of life,
- Ensuring structural reorganization of the economy,
- Defining strategic investment priorities,

- Promotion of entrepreneurship and private investment,
- Creation of additional jobs,
- Attracting investment resources from internal and external sources,
- Creation and promotion of collective non-governmental investment structures for the accumulation of savings by individuals and legal entities to attract investments,
- Support to SMEs;
- Improving the system of privileges and sanctions during the implementation of the investment activities,
- Developing conditions for the formation and development of venture investments.

Investment policy in the investment market should be aimed at:

- Defining the target volumes of investments and their structure for each period in line with the branch, reproductive, technological, regional and ownership types;
- Defining investment priorities;
- Increasing the efficiency of investments.

### **Investigation methods**

The same methods as private investments regulate foreign investments, but the instruments may differ in some way. State guarantees, tax instruments, including privileges, temporary tax exemptions, institutional support measures, and the establishment of advisory bodies, entry permits for specific areas of activity, restriction or total prohibition of certain activities are used in the attraction and regulation of foreign investments.

Depending on the degree of the government influence on investment activities, investment policy methods fall into passive and active types. Passive methods are related to the orientation of investors in choosing the most effective investment options through the development of indicative investment programs. In contrast, active methods are related to direct state investments and the implementation of appropriate measures in the tax and budget sphere by state bodies aimed at the increase of entrepreneurial investment activity.

Among the rational investment plan priorities and the state support of capital investments, the use of the following tools is common: the dynamic model of the cross-sectoral balance sheet.

The state carries out the function of creating a favourable investment environment in the country with the application of the active method, which is connected with the increase of the efficiency of the investment activity, as well as with the help of



the tools of the method, which can be summarized as follows: ensuring favourable conditions for private investors, direct state participation in most efficient and significant investment projects for the country, application of internationally accepted criteria for assessing the financial efficiency of investments, such as current value, internal rate of return, repayment period, promotion of private sector investment through tax incentives.

### **Results obtained**

The state investment policy consists of two main components: regulation of investment activities and implementation of state investments. Moreover, the state acts as an investor in the sectors of vital products, social sphere and other spheres of state importance.

To reveal the peculiarities of the state investment policy in the field of investment market formation and regulation, it is essential to reveal the key features of the state investment policy, which lie at the core of the notion itself.

First of all, as an essential feature of the state investment policy, it is expedient to single out the aspect of public interest from the point of view of economic and social and other beneficial effects of the investments.

Thus, some economists describe the investment policy as an integral part of the state economic policy aimed at ensuring overall economic growth or investment efficiency<sup>(20)</sup>, or as a policy, the strategic goal of which is the modernization of the national economy that will eventually lead to effective economic development<sup>(21)</sup>.

The essence of the state investment policy is considered in the context of the development and application of the system of economic regulation measures aimed at creating a favourable investment environment and increasing the efficiency of the use of investment resources<sup>(22)</sup>.

A. Bogatiryov defines the state investment policy as an interconnected intra-economic function of the state ensuring the funding of investment activities<sup>(23)</sup>. Meanwhile, according to I. Vdovin, strategic and tactical priorities are set for the collection of investment (national, foreign and transnational) resources aimed at the organization of the reproduction of material goods in the society through the state

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<sup>(20)</sup> Kushlan V.I. *State regulation of the market economy*. Moscow: RAGS Publishing House, 2005. P. 332  
<sup>(21)</sup> Babashkina A.M. *State regulation of the national economy*. Moscow: Finance and Statistics, 2007. P. 224.

<sup>(22)</sup> Shastin A.V. *State investment policy and investment process in the transforming economy of Russia: Thesis for the Candidate Degree in Economy*. Omsk, 2005. P. 57

<sup>(23)</sup> Bogatyrev A.G. *State-legal mechanism of regulation of investment relations (theory issues): Thesis for the Doctor Degree in Jurisprudence*. Moscow. 1996. 206–208.

investment policy. The main directions of state policy in this respect are the elaboration of national and regional investment development strategic programs and projects, the attraction of foreign and local investors, supporting the implementation of investment projects, coordination of investment activities of involved entities based on the cooperation with foreign governmental and non-governmental organizations<sup>(24)</sup>.

The above-described definitions stem from the general approach to the targeted public investment policy, which implies economic growth at the expense of private investments. Moreover, in connection with the state investment policy, such terms as "investment efficiency", "promotion of investment activity", "economic growth" are noteworthy. Thus, according to the group of authors mentioned above, the main goal of the state investment policy is to stimulate the activities of private investors and increase the efficiency of investment activities to ensure economic growth. From our perspective, the above approach somewhat limits the perception of the term 'public investment policy, seeing it as an element of public administration of the economy. Thus, the definitions presented above, though they assess the beneficial impact of investments on the economy, they do not place the necessary emphasis on their positive social impact.

Therefore, when developing the concept of public investment policy, it is expedient to take into account the peculiarities of investment relations and historical experience in our country, as well as the current trends in world practice, in particular in terms of directions of investments such as "social investment" and "development funding".

Therefore, we hold the opinion that the stance of the specialists who are in favour of the comprehensive approach to the definition of the state investment policy is more appropriate, as in this way they consider it as an integral part of the state socio-economic policy<sup>(25)</sup>.

In the definitions proposed by those experts, the state investment policy and creating conditions for the implementation of the economic process, ensuring the availability of investment resources for organizations and their effective use, also aims to increase the living standards of the population. At the same time, it is mentioned that the state investment policy is aimed not only at ensuring not only economical but also social, environmental, scientific, technical and other beneficial effects<sup>(26)</sup>.

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<sup>(24)</sup> Vdovin I.A. *The mechanism of legal regulation of investment activity*. Thesis for the Doctor Degree in Jurisprudence. Saint-Petersburg, 2002. P. 11.

<sup>(25)</sup> Igoshin N.V. *Investments: Organization, management, financing: a textbook for university students*. 3rd ed., Moscow: UNITI-DANA, 2005. P. 87

<sup>(26)</sup> Radchenko V.M., Ionov Yu.G. *Investment policy in the strategy of innovative development*. Bulletin of TsIRE and RNTSIE. Series "Problems of Regional Economy. 53. Yu.A. Korzhagin (Ed.) Voronezh: TSIRE and RNTSIE. 2013. [Electronic resource]. URL: <http://www.lerc.ru/?part=bulletin&art=53&page=5> (date accessed: January 1, 2018).

N. Kosov considers the state investment policy as the direction of financial means towards the realization of the goals of social reproduction in accordance with the interests of the state in the given socio-economic conditions, while the interests of the state are the condensed interests of the whole society, that is, the ultimate goal of the state investment policy is to satisfy the public interests<sup>(27)</sup>.

The above definition emphasizes the social orientation of investments, i.e. the essence of the state investment policy is revealed as a component of socio-economic policy that deserves support.

As a second feature of the state investment policy, we can present the perception of the latter as an activity aimed at developing the system of conditions and preconditions necessary for investment activity, which is equally relevant to both government agencies and entrepreneurs<sup>(28)</sup>. In contemporary scientific literature, state policy is also defined as the preparation and implementation of a series of policy decisions on the production, distribution and redistribution of public resources through government activities<sup>(29)</sup>.

Some authors draw attention to the fact that at present, the state policy is developed and implemented by government agencies with the involvement of civil society institutions<sup>(30)</sup>, which seems to be quite close to the current situation, given the growing role of self-regulatory organizations in the legal settlement of relation in financial markets. Thus, the state investment policy in the investment market is the joint activity of state bodies, public institutions, including self-regulatory organizations, within the framework of public administration and legal regulation of investment relations.

As a third feature of an investment policy, we can single out the following: the state investment policy reflects the clear position of the state in relation to investment activities by combining the goals and principles of its implementation, as well as management directions in the investment market to ensure a more effective solution of economic and social problems.

Thus, the state policy is developed based on meeting the public interest, taking into account private interests, without which it is impossible to attract private investments for the implementation of state tasks.

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<sup>(27)</sup> Kosov N.S. *Conceptual foundations for the formation of a state mechanism for regulating the investment process*. Thesis for the Doctor Degree in Economy. Moscow. 2002. P. 147.

<sup>(28)</sup> Kabir L.S., Lakhmetkina N.I., Malofeev S.N. *Investment policy of Russia: Search for a strategic vector of development*. Financial analytics: problems and solutions. No. 18. 2010. [Electronic resource]. URL: <http://cyberleninka.ru/article/n/investitsionnaya-politika-rossii-poisk-strategicheskogo-vektorarazvitiya> (date accessed: January 1, 2018)

<sup>(29)</sup> Smorgunov L.V. *Comparative Political Science: Theory and Methodology for Measuring Democracy*. Saint Petersburg: Saint Petersburg University Press, 1999. P. 376.

<sup>(30)</sup> Gogolev A.M. *Tax policy as a fundamental element of the organizational and legal mechanism of the concept of public administration in taxes and fees*. Financial Law. No. 10. 2015. 26–33.

The fourth feature of the investment policy is that the latter is adopted for the forecast period, which is usually a long-term one. In fact, the investment policy cannot be stable, as the latter is subject to change at each stage of the economic cycle, differing significantly, for example, at different stages of the crisis, both in the period of decline and recovery. It is assumed that any policy is valid only for the specific conditions available in a particular period. Historical experience clearly shows that the approaches that effectively overcome crisis at a certain stage of history can later lead to the emergence of a new crisis in an already changed economic situation.

The fifth feature of the state investment policy is that the latter defines the priority areas of capital investments<sup>(31)</sup>, determines their volume, structure, scale, as well as their sources<sup>(32)</sup>. V. Alimov describes the state investment policy as a purposeful activity of the state, the aim of which is to find sources of investments, to determine the appropriate directions and frameworks of their use to ensure the conditions of capital reproduction in the country<sup>(33)</sup>. In other words, the state investment policy is aimed at defining the investment priorities and the sources of attracting investments.

The state investment policy is implemented through a set of tools available at the disposal of the state - a complex of tools to influence the economic activities and all the involved participants. It is implemented based on laws, government decisions and other legal acts adopted by state bodies.

Public investment policy instruments can be divided into three main groups: macroeconomic, microeconomic and institutional. The first group includes the tools that provide a common economic environment for investments, particularly affecting the interest rate, economic growth rates and foreign economic relations.

Among the microeconomic investment tools, the most effective ones are those measures that directly affect the number of funds available to businesses. Potential sources of internal investment for organizations are the amortization fund assets and the net profit, which demonstrates the significant impact of taxing instruments on the investment process. In particular, within the framework of tax regulations, specific investment promotion measures are implemented, such as accelerated amortization, tax holidays during investment, and deductions from taxable profit in the number of capital investments of production non-production significance.

Institutional instruments of investment policy involve the mechanisms of coordinating the investment decisions made by private companies with government

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<sup>(31)</sup> Shapovalova N.N. (Ed.) *General economic foundations of the market economy*. Moscow: "Way of Russia". 2002. P. 255.

<sup>(32)</sup> Raizberg B.A., Lozovsky L.Sh., Starodubtseva E.B. *Dictionary of the modern economy*. 6th ed. Moscow: INFRA-M. 2011. P. 512.

<sup>(33)</sup> Alimov V.V. *The influence of state investment policy on the formation of the country's investment climate*. Business in law. No 3. 2010. 247–249.

investment programs and the development of relevant infrastructures and specialized development institutions. The attraction of investment is facilitated by timely and quality information and the exchange of advice between government and business.

### **Conclusion**

Thus, the state investment policy is the activity of state bodies and institutions to influence the investment market, redistribute capital flows in favour of settling public issues, and attracting investments to priority areas of economic development. Within the framework of state regulation of the investment market, the key role of public investment policy is to ensure the balance of private and public interests in the market, taking into account that the personal interest is manifested in directing the investment activity to maximum profits, while the public interest lies in the state's strive to achieve socially effective results, using investments in transport, social, energy and other infrastructures. This, in turn, stimulates the growth of key sectors of the national economy, such as industry and agriculture, the development of innovative technologies, such as improving the quality of life of the population, providing housing, improving the quality of medical care, education, etc. Thus, the state investment policy ensures a balanced approach within the framework of the regulation of investment relations, taking into account both macroeconomic and microeconomic approaches to the regulation of the sector.

In the professional literature, the approach that presupposes economic growth at the expense of private investments prevails over the general purposefulness of the state investment policy. Moreover, in terms of state investment policy, terms such as "investment efficiency", "promotion of investment activity", "economic growth" are noteworthy. Thus, according to the group of authors mentioned above, the main goal of public investment policy is to stimulate the activities of private investors to increase the efficiency of investment activities to ensure economic growth. From our point of view, the above approach somewhat narrows the perception of the term public investment policy as an element of public administration of the economy, or by assessing the beneficial impact of investment on the economy, they do not place the necessary emphasis on the positive social impact of the investment.

Therefore, when developing the concept of public investment policy, it is expedient to take into account the peculiarities of investment relations and historical experience in our country, as well as current trends in current world practice, particularly in such areas of investment as "social investment" and "development financing." In our opinion, the approach that envisages a more complex formulation of the state investment policy is more correct, considering it as an integral part of the state

socio-economic policy. In case of such an approach, in addition to creating conditions for the implementation of the economic process, ensuring the availability of investment resources for organizations and their effective use, the main socio-economic goal of the state investment policy is to increase the living standards of the population, not only economically but also socially. Ensuring environmental, scientific, technical and other beneficial effects

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ԳԻՏԱԿՐԹԱԿԱՆ ՄԻՋԱԶԳԱՅԻՆ ԿԵՆՏՐՈՆ  
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*Համարի թողարկման պատասխանատու և գլխավոր խմբագիր՝*

ՆԱԻՐԱ ՀԱԿՈԲՅԱՆ

*Համակարգչային ձևավորումը՝ ՎԻԿՏՈՐՅԱ ՍԱՐԶԱՆՅԱՆԻ*

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